APPENDIX K: Agency Comments (F - Z)

From: Chandra Lewis <chandralewis@fs.fed.us>
To: <MStopher@dfg.ca.gov>
CC: Christine Nota <cnota@fs.fed.us>, Debra Whitman <dwhitman@fs.fed.us>, Ba...
Date: 12/4/2009 3:25 PM
Subject: 2600/2800; Califonial Department of Fish and Game Initial Study, SuctionDredge Permitting and SEIR - Forest Service Response
Attachments: Attachment 5 - SBNF Riparian BA Tables 1 and 2.docx; Attachment 1 - R5 Draft EIR Response-Forest Issues.docx; Attachment 2 - R5 FS letter to CDFG-12-27-2007.pdf; Attachment 3-2006 PNF letter.docx; Attachment 4 - Plumas NF photos.docx; FS_correspondence.doc

Hard copy of this letter and it's attachments were sent via FedEx to Mark Stopher.

The following Correspondence is archived in the Records database. Any enclosures will follow the letter in this message.

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Attachment 1

The following is a list of suction dredging issues that each National Forest in the Pacific Southwest Region discussed. I have summarized each of the Forests response in an attachment.

Angeles National Forest

The Angeles National Forest comments and recommendations contained in the December 27, 2007 letter are still accurate though we have new information to include in our comments.

Potential post-fire hydrologic and geomorphic impacts associated with the Station fire (and to a lesser extent the Morris fire) will most likely materialize over the next couple of years within the four watersheds of the Forest. These potential mud flows and debris flows are expected to result in significant impacts to stream courses and the biota dependent upon them. In cooperation with California Department of Fish and Game (CDFG), U.S. Fish and Wildlife Service (USFWS), and the U.S. Geological Survey, the Forest is engaged in species salvage operations where listed species are being brought into captivity at local zoos until such a time as the watersheds recover. We are hoping that this drastic action will assist in promoting the long-term survival of these species. Additionally invasive species detection surveys are being conducted and the Forest plans to act aggressively to keep these invaders in check. Lastly, the Forest has issued a Closure Order for approximately one quarter of the Forest to safeguard human life and also minimize soil disturbance within the watershed to promote watershed recovery.

The topography of the Angeles National Forest causes human activities to be concentrated in the river bottoms. The canyons are steep-sided and narrow from a human use perspective which causes a higher probability of user group conflict and increases potential for resource damage. Every recreational use imaginable was represented in the East Fork of the San Gabriel River prior to the enactment of the State law prohibiting the issuance of suction dredging permits and suspending the operation of suction dredges permitted for use under the program. This concentrated use results in extreme pressure on the natural resources of the area and on public service providers. High numbers of Forest users involved in suction dredge mining, prolonged unauthorized occupancy, and other dispersed recreational opportunities along the East Fork caused parking issues, dumping and trash issues, health and safety issues, overuse of a picnic area located adjacent to the River, and resource damage. With this as background, the Forest suggests that the State has underestimated the incremental demand associated with suction dredge mining on public services and transportation/traffic. Please pass along our recommendation that each stream reach identified in the regulations be evaluated based on local characteristics and projected use.

Lastly, we would like to suggest that the State consider realigning their regulations that pertain to the Angeles National Forest to recognize the inherent conflict with federal law, namely the Watershed Withdrawal Act of 1928. Although the State asserts that nothing in the regulations authorize activities that are otherwise prohibited, we have witnessed the confusion of the public

when they figure out that large portions of the Angeles National Forest have been withdrawn from mineral entry and are not open to suction dredge mining. We are further put at a disadvantage to enforce federal law owing to lack of enforcement authority. The easiest solution to avoid public confusion and anger would be for the State to incorporate the restrictions of the Federal law within the State regulations.

Eldorado National Forest

We reviewed the 2007 Regional Office comments to the State for accuracy and to determine if there are any new issues that should be discussed in the upcoming study and SEIR. We would like to add the following discussion of known effects to aquatic species on the Eldorado National Forest.

On the Rubicon River, aquatic surveys of the past few years for the relicensing of the Middle Fork American Project have concluded that the best population of foothill yellow-legged frogs (*Rana boylii*) in the project lies near a site where suction dredge mining occurs. The population is already reduced due to the effects of irregular stream flows from the hydropower project on the Middle Fork American River. The Rubicon River tends to have ideal flows for foothill yellow-legged frogs but suction dredging may be affecting populations where it is occurring during critical periods. Gravel and rocks can be moved many feet during suction dredging, and this is the same substrate where egg masses are attached or where tadpoles reside. Survival of eggs or tadpoles where disrupted at their habitat site is unlikely. In dry years, most egg masses hatch by the beginning of June, although in wetter years, this time period could be much later, even into July.

We have observed effects of suction dredging upon foothill yellow-legged frogs at Camp Creek where foothill yellow-legged frog egg masses have been observed. Egg masses occurred in the same pool where suction dredging was later observed. It is possible that egg masses were destroyed or tadpoles were buried by this activity. The early summer appears to be the critical time period since later in the summer the older tadpoles may be able to move out of the way from a localized disturbance from suction dredging.

Both the Rubicon River and Camp Creek also support western pond turtles (*Clemmys marmorata*). The juvenile and adult life stages could be disturbed by suction dredging, although it is most likely that western pond turtles would move out of the way from such disturbance. Downstream water turbidity reduces high water quality.

The Eldorado NF Fisheries Biologist also suggested that CDFG use a start date on streams with Foothill Yellow-Legged Frogs based on the water year since the amount of water flow (water year) is a determining factor on when the eggs hatch and the tadpoles are mature enough to get out of the way of suction dredge intake hoses.

Inyo National Forest

The Inyo NF felt the issues are adequately discussed in the subject documents.

Lassen National Forest

The Lassen National Forest streams provide habitat to State and federally listed anadromous fish (steelhead and Spring-Run Chinook salmon and other aquatic life). We are concerned about any potential negative impacts resulting from suction dredge activities on the Forest.

Plumas National Forest

The Plumas National Forest would like to reiterate that most common issues related to suction dredging are camping and residential occupancy, which requires significant commitments of time from the Forest Service mineral administrators. The Forest would also like to see a requirement that large rocks or boulders (e.g. larger than three feet in diameter) that are moved by mechanized equipment during suction dredging be replaced in their original position to minimize impacts to stream stability and aesthetics.

In response to the Region's request for comment on the Initial Study Suction Dredge Permitting Program Subsequent Environmental Impact Report, the Plumas National Forest included two documents that are included in this letter: 1) Plumas National Forest letter dated December 6th, 2006 (Attachment 3) comments to the California Department of Fish and Game (CDFG) Suction Dredging Regulations and impacts from resulting mining activities on the Plumas National Forest; and 2) photographs of effects to habitat by dredging activities, Plumas National Forest memo dated July 17th, 1997 with (Attachment 4). The Plumas NF also include a paper of "Effects of Suction Dredging on Streams: A review and Evaluation Strategy" dated, July 14, 1995 in hardcopy that is available upon request.

In 1997 the Forest responded to a Regional request on Suction Dredging Activities, the following is a summary of these comments, and includes some additional new information. Those comments are in the hard copy addressed to Hilton Cass, Regional Mining Geologist, dated July 17, 1997.

In addition, the Plumas National Forest proposes the following wild trout streams should be closed to suction dredge mining or at a minimum implement a season of use (to protect fish spawning habitat and young of the year within spawning gravels) in the following drainages: Yellow Creek (Plumas Co.), Nelson Creek (Plumas Co.), and Middle Fork of the Feather River (Plumas and Butte Co.): Class B (Open dredging from July1 through August 31) or Class C (open dredging from July 1 through Sept. 15th).

Section 5.5.9 (pg. 19), Timing: The Forest recommends a season of use to protect the California red-legged frog (USFWS Federally listed as Threatened), mountain yellow- legged frog (USFWS Candidate Species) and the foothill yellow-legged frog (USFS Sensitive Species).

The Plumas National Forest recommends the following streams be closed to suction dredge mining. No dredging should be permitted at any time (Class A) within the following drainages because of known populations of the California red-legged frogs; French Creek, Jack's Creek, Pinkard, (Butte County) and Little Oregon Creek (Yuba County), and within the following drainages because of known populations of the mountain yellow-legged frogs; Boulder, Lone Rock, Pierce, West Branch Lights Creek, Rowland, Clark's, Grizzly Creek, Cat, Dark Ravine, Big Ravine, South Fork Rock Creek, Willow Creek, Sulfur, Sawmill Tom, Cooks, Wolf Creek , (Plumas Co.), Pine Grove Creek, Rabbit, Potosi, Slate and tributaries (Plumas/Sierra Counties), Lower Mill Creek, Fall River (Butte Co.) ,Upper Middle Fork Feather River, Gold Run, (Sierra/Plumas Co.).

The Plumas National Forest recommends that at a minimum a season of use as described below be implemented to reduce effects to these TES amphibian species. The Plumas National Forest has a few streams with mountain yellow-legged frogs (USFWS candidate species), as described above; and numerous streams with known populations of foothill yellow-legged frogs (Forest Service sensitive species), as identified below. Suction dredging has the potential to impact these populations. In previous comments submitted by Plumas NF for suction dredging, a limited operating period was suggested to help protect the frogs. Information we have obtained since those comments were submitted indicates the limited operating period suggested may be insufficient to protect vulnerable life stages of frogs. In streams occupied by foothill yellow-legged frogs, we recommend that season of use for suction dredging begin after September 1st and extends no longer than March 31st, unless surveys show there are no foothill-yellow legged frogs in that section of stream. Foothill yellow-legged frogs metamorphose from tadpoles to frog metamorphs in one season. Beginning the season of use late in the summer will ensure that most tadpoles have reached a life stage less vulnerable to suction dredging. In streams occupied by mountain yellow-legged frogs, we recommend that suction dredging not be allowed. Unlike foothill yellow-legged frogs, mountain yellow-legged frogs usually take two seasons to mature, so there are tadpoles present in streams year-round. Because mountain yellow-legged frogs are a candidate species for listing under the Endangered Species Act, caution is warranted. A season of use starting after September 1st and extending no longer than April 30th, would better protect mountain yellow-legged frog tadpoles from impacts from suction dredging than current regulations, but a limited season of use would not fully protect frogs.

At a minimum; the Plumas National Forest recommends that a season of use (September 1st – March 31st) be implemented for streams with known populations of foothill yellow-legged frogs: Butte County - Concow, Dogwood, Magalia, Pine Cluster, Pulga, American House Ravine, Barnards Diggings, Bean, Bear Ranch, Carpenter, Flea Valley, Frazier Cabin, Grizzly, Hunters Ravine, Kanaka Creek, Little North Fork Feather River; Plumas County/Butte County - Indian Creek, Meadow Valley Creek, Spanish Creek, McNair Meadow, Middle Fork of the Feather River, North Fork of the Feather River, Little North Fork of the Feather River, South

Fork Feather River, South Fork Rock Creek; Plumas/Sierra Co's - Slate Creek and tributaries, Rock Creek, Onion Creek, Oroleve Creek, Valley Creek, Woodleaf Creek; Yuba County - Yuba River.

In addition, there is one Congressionally-designated Wilderness within the Plumas National Forest that is withdrawn from mineral. The Buck's Lake Wilderness also is within the Buck's Critical Aquatic Refuge and the mountain yellow-legged frog (*Rana muscosa*) and foothill yellow-legged (*Rana boylii*) frogs are found within these areas. In addition; the Lake's Basin Recreation Area (which is on both the Plumas NF and the Tahoe NF) is within the Lakes Basin Critical Aquatic Refuge and the Mountain yellow-legged frog (*Rana muscosa*) is found within this area. All streams within the Buck's Lake Wilderness and the Lakes Basin Recreation Area should be classified as closed to dredging at all times.

Other general comments:

Please clarify that the definition of fish includes all biological management indicators (BMI) such as benthic macroinvertebrates and amphibians (all life stages).

Section 5.5.10 – Encampments (pg. 20): Sanitation and lack of restroom facilities, and potential for disposal of human waste adjacent to stream, and contamination of streams.

Page 50, discussion of impacts to wildlife, include a discussion on effects to amphibians by removal of LWD through dredging practices.

Safety issues for anglers and other recreational users are not addressed. There are large deep holes caused by dredging (example Chip's Creek on the NFFR – a hole that is approximately 4 feet in diameter and over 5 feet deep), also cables and other equipment in the rivers that can be hazardous to anglers and recreationists.

<u>San Bernardino National Forest</u>

The following recommendations are clarifications to that letter to protect threatened, endangered, and sensitive species on the San Bernardino National Forest in regard to suction dredging activities:

<u>Forest-wide:</u>

1. Recognize that the San Bernardino National Forest has newly designated wilderness on the San Jacinto Ranger District in addition to areas that were recommended to be wilderness as identified in the 2005 Land Management Plan. Suction dredging should not be allowed in these special designation areas; such as research natural areas, wilderness areas, etc.

2. In order to provide protection to known federally-endangered riparian bird breeding activities, please identify the need for miners to contact the Forest Service prior to any

suction dredging activities proposed on the San Bernardino National Forest. This will allow communications with the miners to coordinate performance of dredging operations outside of the breeding season for these species. If possible, please accomplish this through the CEQA process and subsequent implementation of the proposed action.

Mountaintop Ranger District:

1. Please exclude suction dredging from any perennial or intermittent water source that occurs on the Mountaintop Ranger District, to minimize impacts to know occurrences, critical habitat, and suitable habitat for federally threatened, endangered, and sensitive species.

San Jacinto Ranger District:

1. Please exclude suction dredging from streams that were designated as Critical Biological Zones in the 2005 Land Management Plan. This includes Bautista Creek, Fuller Mill Creek, and North Fork San Jacinto River.

2. The 2008 Riparian Biological Assessment (Attachment 4) for ongoing effects to seven listed riparian/aquatic species contains all known occurrences and critical habitat of threatened and endangered species on the Forest by Ranger District (see Attachment 4 - Table 2). In order to protect these species, we recommend that streams that are identified on this list as occupied or critical habitat for mountain yellow-legged frog, arroyo toad, San Bernardino kangaroo rat, and slender-horned spineflower be excluded from suction dredging.

3. The Forest requests that suction dredging be excluded from any perennial or intermittent water sources that are identified in the above bullet statement.

Front Country Ranger District:

1. Please include the requests made in a letter addressed to the California Department of Fish and Game dated December 27, 2007.

2. To protect Forest Service Sensitive listed fish species, Santa Ana speckled dace, please exclude suction dredging from Plunge Creek.

3. The 2008 Riparian Biological Assessment for ongoing effects to seven listed riparian/aquatic species contains all known occurrences and critical habitat of threatened and endangered species on the Forest by Ranger District (see Attachment 4 - Table 2). In order to protect these species, we recommend that streams that are identified on this list as occupied or critical habitat for mountain yellow-legged frog, arroyo toad, San Bernardino kangaroo rat, and slender-horned spineflower be excluded from suction dredging.

4. To protect the habitat in the Santa Ana River, please consider excluding it from suction dredging. The Santa Ana River has been identified as a suitable location to re-establish populations of native fish including the endangered Santa Ana Sucker.

Shasta-Trinity National Forest

The last couple years has seen a drastic increase in the number of suction dredges in operation in Trinity County. One small creek in particular, Dutch Creek has a claim that is owned by an operator that leases rights out to dredgers. This creates a situation where multiple dredging operations can effectively take place on one claim. Dutch Creek is small (2 cubic feet per second (CFS) summer base flow and average wetted channel width of 8 feet) and having multiple mining operations on one claim has really altered the particle size distribution. Gravels are becoming scarce as mining has created geomorphic instability and allowed the gravels to be transported downstream to the mainstem Trinity River. This has resulted in an abundance of boulders and a lack of gravels. The creek has also become entrenched within and below the mining activity. With the creek effectively disconnected from its floodplain the channel acts mainly as a transport pathway for bedload and depositional (spawning) areas are hard to come by. This creek serves as spawning and rearing areas for winter steelhead, coho, and fall-run chinook. Canyon Creek has also been heavily impacted by suction dredge mining. This creek is listed as a Tier 1 watershed and is also listed as a key watershed and supports winter and summer steelhead, coho, and spring and fall chinook. The North Fork Trinity River and its largest tributary the East Fork North Fork Trinity River are also listed as a key watershed. Suction dredge mining operations here are adversely impacting anadromous fish. The North Fork Trinity River is one of the top summer-run steelhead streams in California and measures should be taken to insure that they are protected. In addition, this stream supports spring and fall chinook, winter steelhead, and coho. The New River is the single largest producer of summer run steelhead in California and is also listed as a key watershed. Suction dredge mining has occurred extensively here and is impacting summer and winter steelhead and spring and fall chinook. There are countless other creeks that are impacted from suction dredge mining in Trinity County as well. The Trinity River watershed is an incredible fisheries resource and suction dredge mining appears to be hampering efforts to recover SONCC Coho. Suction dredge mining in any waters that have anadromous fish within the Trinity River watershed should be evaluated for impacts on those fisheries. Currently, our fisheries program is in the planning phases for gravel injection and large woody debris placement for several creeks to mitigate for lack of suitable size spawning gravels.

In addition to the previously listed Trinity River tributaries, Soldier Creek, Hayfork Creek, Deadwood Creek, Rush Creek, Brown's Creek, Reading's Creek, Big French Creek, and Manzanita Creek also host significant anadromous fisheries represent the bulk of our creeks that support anadromous fish and have had recent suction dredge operations.

Other impacts that have not been mentioned are that suspended sediment: (1) increases daytime water temperatures, this is important to note as most of our creeks temperatures during midsummer approach the threshold of concern (TOC) value of 67 F for salmon; (2) Suspended sediment increases the mobility of waterborne pathogens; (3) Turbidity decreases light levels reaching the stream bottom thereby inhibiting primary productivity of the aquatic system. Many types of aquatic macroinvertebrates utilize aquatic vegetation as a primary food source and in turn many anadromous juveniles utilize these bugs as food.

Stanislaus National Forest

We would like to commend the agency for its thorough consideration of the resources potentially affected by suction dredging and the extensive use of literature to support the rationale for establishing significance.

We would like the SEIR to additionally consider the impact of suction dredging on reproductive success of the foothill yellow-legged frog, particularly as pertains to early season breeding activity. In late spring, male foothill yellow-legged frogs congregate near suitable breeding habitats where individuals establish and defend territories (Wheeler and Welsh 2008) and employ calling to entice a mate. MacTague and Northern (1993) reported a majority of calling for mates involved underwater vocalizations; however, Davidson (199) reported calling also occurred above water. We believe the early season operation of dredges has the potential to disrupt breeding activities in two primary ways. The presence of dredgers in or near suitable breeding habitat during the breeding season may result in regular disturbance of males which may cause them to abandon preferred calling locations which may have social implications in frog mating and may result in impaired reproductive success as described in Wheeler and Welsh (2008). The operation of dredges may interfere with the vocalizations of males and impact breeding success since the vocalizations are used to attract suitable mates. On the Stanislaus National Forest, dredging occurs in several locations where the population size is believed to be small and the dredging impacts that may be affecting these occurrences may have broader implications relative to long term viability of the populations. We recommend that the season of operation for streams with known populations of the frog start on or later than June 15 to mitigate these potentially significant impacts. Since surveys have not covered all streams potentially affected by suction dredging, we also recommend that the season of use be adjusted accordingly should additional populations of the frog be discovered in the future.

The Stanislaus NF would like CDFG to provide a process for the Forest Service to provide feedback to CDFG regarding start and end dates or closures for stream reaches. Monitoring of sensitive species may indicate trends in populations and adjustments in the suction dredging season may be warranted.

Tahoe National Forest

The issues described in DFG's SEIR and the Initial Study adequately addresses the issues surrounding the controversy of suction dredging, except for the following items:

1. Suction dredging utilizes mechanized equipment; so an approved Plan of Operations is necessary for suction dredging activity on Forest Service lands. Many adverse impacts of suction dredging can be mitigated by compliance with Conditions of Approval.

2. Vehicles, trailers and suction dredges can introduce and spread noxious weeds, including aquatic weeds, to the riparian ecosystem.

3. Encampment, which is the act of setting up a physical living area, involves activities that can be deleterious to riparian habitat, aquatic resources, and water quality. The adverse impacts of encampment include:
    a. Unauthorized roads and/or trails to the camping area;
    b. Compaction of the soil on the road, camp and stream bank;
    c. Introduction and spread of noxious weeds;
    d. Removal of riparian vegetation;
    e. Lack of adequate sanitation;
    f. Disposal of human waste and garbage on land and into water;
    g. Contamination of domestic water supplies;
    h. Inadequate fuel storage;
    i. Soil erosion;
    j. Noise from dredges could adversely affect forest sensitive wildlife species;
    k. Abandoned equipment and vehicles;
    l. Unauthorized permanent structures; and
    m. Unauthorized occupancy.

The potential impacts of suction dredging are *more* than was described in the CDFG Initial Study. For example, Section XIII, of the Initial Study, Public Services, does not adequately represent the adverse impact of dredging on the Forest Service Law Enforcement work force and the Department of Fish and Game Wardens.

Section XIV. Recreation states that there is a Less-than-Significant Impact to recreational facilities. Suction dredgers on the Tahoe NF do contribute to an increase in campsites being utilized, often for the entire summer.

Section XV. Transportation/Traffic states that there is a Less-than-Significant Impact to inadequate parking capacity. The Tahoe NF has reached full parking capacity on the Highway 49 Scenic Corridor due to suction dredgers requesting to camp near their claim.

The Tahoe NF does not believe that the current CDFG suction dredging regulations are adequate. The Tahoe NF does not have time during this initial comment period to adequately describe

which suction dredge regulations are inadequate; however, Tahoe NF Fisheries Biologist prepared the following comment:

Suction dredging overlaps the habitats of both foothill yellow-legged frog (*Rana boylii*) and rainbow trout (*Oncorhynchus mykiss*) in the following streams, Duncan Creek, North Yuba, Downie River, North Fork of the Middle Fork and Eldorado Canyon Creek. The timing of spawning for rainbow trout in the above watersheds occurs from February through May. For foothill yellow-legged frogs on the Tahoe National Forest, breeding and egg laying usually await the end of spring flooding and may commence any time from mid-March to May, depending on local water conditions. The breeding season at any locality is usually about two weeks for most populations. Based on known occupancy and habitat, the Tahoe National Forest is in agreement with the Plumas National Forest, which states in the Forest Service December 17, 2007 letter that "Due to the deleterious effects seen to fish and amphibian, specifically in the form of inhibiting the hatching of eggs, development of fry, fingerlings and tadpoles, and the survival of adults, as well as the sediments levels also adversely affect the food source (benthic invertebrates) of trout in our fish bearing streams, we request that consideration be granted for moving the beginning of dredging season on perennial fish bearing waters from the 4th Saturday in May to the 4th Saturday in June.

USDA United States Department of Agriculture | Forest Service | Pacific Southwest Region

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File Code: 2600/2810
Date: DEC 27 2007

California Department of Fish and Game
Attn: Suction Dredge Mining
1416 Ninth Street
12th Floor
Sacramento, CA 95814

Dear Sirs:

This letter is in response to your public notice of October 19, 2007, seeking information on suction dredge mining in California. The National Forests of the Pacific Southwest Region have collected much information on suction dredging operations over the past several years. Attached for your convenience and consideration is a compact disc that contains maps, photographs, memo's and monitoring reports prepared by Forest Service personnel that document their observations on suction dredging within the National Forests. I am also attaching a table of contents for the compact disc.

Environmental Impacts of Suction Dredging

The adverse impacts of suction dredging generally fall under the following descriptions:

- Suction dredging can leave piles of loose gravels which attract spawning fish but are inherently unstable resulting in loss of eggs and redds when these loose gravels are displaced in higher stream flows.
- Every effort should be made to ensure suction dredge mining activities do not jeopardize the continued existence of listed species or adversely modify critical habitat.
- Suction dredging can raise the turbidity and increase suspended sediment, particularly when more than one suction dredging operation is occurring in a short length of spawning habitat.
- Chronic disturbance of fishes creates a significant impact by moving organisms to less favorable habitats. This is especially critical in summer when temperatures reach 65 – 70° F. Even minor disturbances form dredging reduces the carrying capacity of aquatic organisms during times of increased natural stress, e.g. water temperature.
- Anadromous lamprey (Pacific and river) are particularly susceptible to dredging since ammocoetes spend up to five years in streams before emigration. The ammocoetes preferred habitat is fines and detritus, making them extremely vulnerable to dredging.

- Freshwater mussels are extremely susceptible to dredging and are imperiled species in California.
- Studies have determined that dredging causes the remobilization of mercury causing mercury to be released to the environment.
- Suction dredging can cause changes in stream channel geomorphology leading to stream channel instability.
- Disturbance to riparian vegetation, downed woody debris and large rock/boulders outside the wetted stream surface is created by high-banking, camping, trail and access route creation.

Suction Dredging Under Current California Department of Fish and Game Regulations

Most National Forests have reported adverse environmental impacts to fish, amphibians, and invertebrates from suction dredging on rivers and streams that are currently open to suction dredging under a California Department of Fish and Game (DFG) permit. Many of these impacts can be addressed by modifying the DFG's classification of the stream and adding language to the regulations to provide better surface resources protection. Please consider the following general recommendations:

- The number of dredges (and sizes) within various reaches (concentration) of waterways have potential to adversely effect through cumulative effects.
- The number of hours each dredge is allowed to operate effects how much material (cu.yds.) potentially is moved. Perhaps limited hours of operation would help in reduction of volume moved as well as with other user conflicts (for example, fisherman, swimmers etc).
- Regulation should define how much of the stream bed can be impacted by dredge holes or piles to help alleviate impacts (for example, dredge piles should not extend more than 1/4 of the wetted channel width).
- Permit limitations on high-banking and trail and access-building in riparian areas outside the wetted stream perimeter would greatly improve water quality/aquatic habitat.
- The use of winches is common and stream alteration permits are rarely applied for or enforced. Most dredgers think that if boulders are not *removed* from the wetted stream surface, a permit is not required. Strong language in the dredge permit that defines when an alteration permit is required may help.
- Human sanitation issues are not addressed in current regulations.
- Fuel storage language as well as fueling requirements can help prevent accidental spills.

Suction Dredging in Water Quality Limited Segments, Clean Water Act Section 303(d) listed waters:

On NFS lands in California many streams are currently listed as impaired waters under Section 303(d) of the Clean Water Act. In those cases where the source of the impairment is sediment, or habitat degradation, the Forest Service is required to improve those waters to meet State water quality standards. In almost all cases, suction dredging is unlikely to be compatible with our Clean Water Act responsibilities. However, individual operators may still obtain approval for their operations, but only when their plan of operations includes steps to result in a net improvement to instream or riparian resources. The local Regional Water Quality Control Board performs the evaluation of the plan of operations and indicates whether it meets State water quality objectives. The Forest Service can not approve a plan of operations without a 401 certification from the State.

In addition, please consider the following specific comments from the National Forests:

Klamath National Forest and Six Rivers National Forest

In November, 2004, the Forest Supervisors for the Klamath National Forest and the Six Rivers National Forest shared with your office via letter their concerns with DFG's classification of the streams of the Klamath River system. Specifically, the Forest Supervisors pointed to overlaps between the periods allowed for suction dredging and the spawning periods and egg-alevin developmental phases for coho, Chinook salmon, steelhead, green sturgeon, and lamprey. The letter makes recommendations on modifying the stream classifications to reduce the potential for adverse impacts. Those concerns and recommendations are still valid. A copy of that letter and supplemental information is included on the attached compact disc.

Plumas National Forest

On the Mt. Hough and Feather River Ranger Districts, the Forest has documented adverse impacts to the environment that include, but are not limited to: high banking, excessive sediment, modification of large in-stream habitat structures (boulders). The cumulative effects are estimated to be at significant levels and causing adverse impacts to water quality, in-stream fish habitat, streambank stability, and aquatic species survival. Please see the attached photos within the enclosed compact disc of suction dredging sites on **Hopkins Creek** and the **Little North Fork Middle Fork Feather River** for illustration.

Due to the deleterious effects seen to fish and amphibian, specifically in the form of inhibiting the hatching of eggs, development of fry, fingerlings and tadpoles, and the survival of adults, as well as the sediment levels also adversely affect the food source (benthic invertebrates) of trout in our fish bearing streams, we request that consideration be granted for moving the beginning of dredging season on perennial fish bearing waters from the 4th Saturday in May to the 4th Saturday in June.

Mountain Yellow-legged frogs (*Rana muscosa*) occur within many of the streams and rivers within the Plumas National Forest. Due to the same concerns as stated above, for suction dredging operations within occupied mountain yellow-legged frog streams or within designated critical aquatic refuges, we recommend that the DFG's suction dredging regulations require a limited operating period (LOP) from May 1st (or beginning of the suction dredging season) to August 30th. This LOP would significantly reduce adverse impacts to mountain yellow-legged frog while still allowing suction dredging operations to continue during part of the year.

The Plumas National Forest is updating their GIS layer for mountain yellow-legged frog and will be available for your use by February, 2008.

Stanislaus National Forest

The Stanislaus National Forest has one of the largest known remaining populations of foothill yellow-legged frog (*Rana boylii*) within national forest lands. Suction dredging overlaps the habitats of both foothill yellow-legged frog and western pond turtle (*Clemmys marmorata pallida*), in the following streams: **Hells Hollow Creek, Big Creek, Bean Creek, Bull Creek, Rose Creek, South Fork Stanislaus River, and the North Fork Tuolumne River**. Local observations on **Rose Creek** confirm that habitat impacts are occurring which includes changes in water flow regimes and sediment regimes. Dewatering has been noted as the streamflow is directed down the sluice box that are occasionally or historically occupied by tadpoles. Dewatering may expose the tadpoles to an unnatural condition and increase the risk for predation. The stream channel has been modified to accommodate the mining equipment and to expose bedrock contact areas, which is the same areas where oviposition occurs. The change in water depth and velocity is also impacting oviposition. Frequent "turnover" of the streambed has been noted, thus the substrates may not have the ability to be colonized and develop the assemblage of algae in the quantity required for foraging by tadpoles.

Two other streams, **Gentry Gulch and Halls Gulch**, are within the range of the limestone and Hells Hollow salamander; however, surveys specific to detecting these species have not been conducted to date. Other primary habitat for the Hell Hollow salamander and limestone salamander is along the **Merced River**, which is a known area for suction dredging. It is unclear what impacts suction dredge mining has on limestone salamander (*Hydromantes brunus*) and Hell Hollow slender salamander (*Batrachoseps diabolicus*); however, since these species are limited in distribution, please consider modifying or reclassifying the streams where they exist. The Stanislaus National Forest has the details on the forest.

Hells Hollow, Big, Bean, and **Bull Creeks** provide suitable habitat for California red-legged frog (*Rana aurora draytonii*), as do portions of the other streams listed above.

Angeles National Forest

We recommend the continuation of "Class A" designation for portions of the San Gabriel River System. We also request that you consider closing the entirety of the **East Fork San Gabriel River** to suction dredge mining based on cumulative impacts within the watershed having deleterious effects to aquatic biota. Aquatic biota within the East Fork San Gabriel include Santa

Ana sucker (*Catostomus santaanae*), Santa Ana speckled dace (*Rhinichthys osculus ssp*), arroyo chub (*Gila orcutti*), mountian yellow-legged frog (*Rana muscosa*), and western pond turtle (*Clemmys marmorata pallida*). Hernandez (1997) conducted surveys in the East Fork San Gabriel and documented the absence of young of the year fish and recommended a seasonal closure to suction dredging. More recent field surveys on the East Fork San Gabriel found evidence of an extended spawning period indicating that a protracted spawning period is present in the stream (A. Backlin, U.S. Geological Survey, Personal Communcation). Santa Ana sucker fry in the West San Gabriel were found exclusively in edgewater habitat over silt at depths of less than 17cm where there was no measurable flow (Haglund and Baskin 2002). Creek bed alterations due to current suction dredging activities preclude edgewater habitat.

Suction dredge mining also currently alters the stream channel of the East Fork San Gabriel by building up rock dams to create large pools for floating equipment. A survey conducted in 1997 over a 3.8 mile stretch of East Fork San Gabriel from **Cattle Canyon** to **Allison Gulch** resulted in a count of 256 suction dredge holes in the river, and 65 mining holes associated with high-banking along the banks (Hernandez 1997).

Two major fires have burned in the East Fork San Gabriel watershed and resulted in impacts to the hydrology of East Fork San Gabriel. These fires include the Williams Fire 2002 and the Narrows Fire 1997. Invasive plants including tamarisk (*Tamarix spp.*) and eupatory (*Ageratina Adenophora)* have become established in the East Fork San Gabriel and are now well distributed along the stream channel. In May 2000, the Total Maximum Daily Load (TMDL) for garbage in East Fork San Gabriel was established. The TMDL was based on estimates of 8000 people visits/day during the summer generating approximately two hundred 32 gallon bags of uncontained trash in and adjacent to the creek each weekend day.

In **Big Tujunga**, there is a similar concern about cumulative impacts to aquatic biota. The biota includes Santa Ana sucker, Santa Ana speckled dace, arroyo chub, and arroyo toad (*Bufo californicus*). Recreation use within Big Tujunga is high. Water withdrawal and recent drought have left the river in a multiple pool state every summer, hence great concern for take on the amphibians or fish remaining in each pool. Invasive bullfrogs continue to impact the fisheries resource. White sweet clover (*Melilotus alba*) and Arundo donax is well established and pervasive in Big Tujunga Watershed. Highbanking has been documented within Big Tujunga as well.

Based on the cumulative impacts on the East Fork San Gabriel and Big Tujunga, we request you consider a change of status to Class A for suction dredge mining.

<u>San Bernardino National Forest</u>

The San Bernardino National Forest has identified a need to close **Lytle Creek (below Miller Narrows)** to suction dredging due to the presence of the Santa Ana speckled dace which is threatened with extinction in the watershed due to many contributing factors. Due to the low water levels in this area, fish are concentrated in a few pools in the summer months and substantial take could occur when suction dredging takes place. We have learned about the

significance of this population in the last few years as a result of a range-wide assessment and FERC relicensing.

The San Bernardino National Forest has identified a need to close **Cajon Creek (below Highway 138)** to suction dredging due to the presence of and threats to arroyo toads and Santa Ana speckled dace. The speckled dace population and threats have really come to light in a recent range-wide assessment and numerous damaging projects such as highway and railroad expansion. Suction dredging and associated disturbance of stream banks will result in take of dace and potential take of arroyo toads. The arroyo toad population in Cajon Creek is isolated and extremely vulnerable due to the many human intrusions in the watershed such as freeways, railroads, pipelines and other human disturbances.

Cleveland National Forest

We recommend continuation of the Class A designation for San Mateo Creek and its tributaries from its mouth upstream, San Juan Creek and its tributaries from its mouth upstream, and Santiago Creek and its tributaries within the Cleveland National Forest. Southern steelhead (*Oncorhynchus mykiss*) and its critical habitat are federally listed and are found within San Mateo Creek.

The following stream segments have known populations of Arroyo toad and are requested to be reclassified as Class A Streams. These areas are documented in the attached maps on the compact disc:

a. **Arroyo Seco Creek** - from Dripping Spring Campground, upstream to the boundary of Agua Tibia Wilderness. 1 mile. (San Diego/Riverside Counties, map 2).

b. **San Diego River**- between Ritchie Creek and Boulder Creek, above El Capitan Reservoir - known toad populations. Approximately 2 miles. (San Diego County, map 3.)

c. **Pine Creek and its tributaries including Noble Creek**- to a point one mile upstream of confluence with Pine Creek; Pine Creek from 2 miles upstream of confluence with Noble Creek to the Pine Creek Wilderness boundary, near Pine Valley. Approximately 8 miles. (San Diego County, map 4)

d. **Kitchen Creek** - From Cibbets Flat campground south for 2 miles. (San Diego County, map 4)

e. **Cottonwood Creek**- from Boulder Oaks (confluence of Cottonwood/Kitchen Creeks), 2 miles south to Buckman Springs. (San Diego County, map 4)

f. **Morena Creek**- and its tributaries between Kernan Road and Morena conservation camp. Approximately 2 miles. (San Diego County, map 4)

In addition, there are several Congressionally-designated Wildernesses within the Cleveland National Forest that are withdrawn from mineral entry and closed to mining, except for those mining claim with valid existing rights before the Wilderness was established. Arroyo toads and Western pond turtle (*Clemmys marmorata pallida*) are found within these areas, which are identified on the maps included on the compact disc. These include the **Agua Tibia Wilderness** (established 1975), **San Mateo Canyon Wilderness** (established 1984), **Pine Creek Wilderness** (established 1984), and **Hauser Wilderness** (established 1984). Lands that have been recommended for Wilderness designation include the **Cutca Valley** area, **Pine Creek**, and **Hauser Canyon**. These are also identified on the maps on the compact disc. All streams within Wilderness and recommended Wilderness should be classified as closed to dredging at all times.

Changed Circumstances and New Information Since 1994

Your public notice asks for new information, since 1994 when the DFG's regulations were last established, on the environmental impacts of suction dredging. There have been several major changes since the 1994 regulations were set. An important change has been the 1997 listing under the Endangered Species Act of the coho salmon requiring federal protection on the Klamath, Salmon and Trinity Rivers and having the Salmon River classified as "Designated Critical Habitat". The primary objective of the *Recovery Strategy for California Coho Salmon* (CDFG 2004) is to return coho salmon to a level of sustained viability, while protecting the genetic integrity of both ESU's, so that they can be delisted and regulations or other protections under the CESA will not be necessary. All watersheds that fall within the range of California coho salmon should be a priority for assessing potential impacts associated with suction dredge mining activity. Protection of the best remaining habitat, especially in areas where coho are still present, and improvements to degraded habitat are both necessary to the recovery of this species.

The other major change has been the die off of salmon in the lower Klamath River due to fatal summertime water temperatures. Limiting disturbance in cold water refugia is critical and should include protection at the mouths of tributaries and prohibition of suction dredging in designated major tributaries. The number and seasons of suction dredging operations must be examined in a particular reach of river.

Also limiting or in some case prohibiting the seasons for suction dredging activities on reaches of the Klamath and Trinity The actions will go a long way in protecting not only the federally listed coho salmon but also the Forest Service sensitive steelhead, lamprey, and green sturgeon.

In conclusion, thank you for this opportunity to provide information for your consideration. I also want to note the positive continued coordination between our agencies to provide for resource protection. Many policies and regulations have changed since 1994 that could affect suction dredging, such as the Best Management Practices (BMPs), forest plans, 303(d) listed waters, and new or revised TMDLs for several rivers and streams. Most of this information can be found within each individual National Forest website (www.fs.fed.us). For details or further information, please contact Hilton Cass, Regional Locatable Minerals Program Manager, at (707) 562-8967 or e-mail: hcass@fs.fed.us or Travis Coley, Regional Fish Program Manager, at (707) 562-8940 or e-mail: tcoley@fs.fed.us.

Literature Cited

California Department of Fish and Game. 2004. Recovery strategy for California coho salmon. Report to the California Department of Fish and Game Commission. California Dept. of Fish and Game. Sacramento, CA. 594pp.

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Sincerely,

RANDY MOORE
Regional Forester

Enclosures

cc: Forest Supervisors

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File Code: 2600/2810 **Date:** December 6, 2007
Route To:

Subject: California Fish and Game Suction Dredging Regulations

To: Regional Forester

The following are comments relating to California Department of Fish and Game (CDFG) Suction Dredging Regulations and impacts from resulting mining activities on the Plumas National Forest. Plumas National Forest comments are provided under the categories outlined by your office in the internal memo issued on November 16, 2007.

1) Whether suction dredge mining activities results in adverse impacts to the environment:

- The Plumas NF has documented incidences (see Attachment 1, Figures 2 and 3) where suction dredging has modified in-stream fisheries and amphibian habitat. Based on Regional Office letter dated May 26, 2004, suction dredging is defined as "the excavation of unconsolidated sands and gravels from the streambed with a motorized, hand held device." The movement of large boulders by a winch and chain (Figure 2) and the excavation of streambanks (Figure 3) do not appear to meet the intent of the suction dredging definition.

  The Plumas NF requests that the CDFG clarify in their suction dredging regulations the definition of what constitutes unconsolidated sands and gravels, and whether the movement of large boulders and the excavation of a streambank are compatible with existing or revised suction dredging regulations.

- Of the 1000 estimated mining claims we have on the Mt. Hough and Feather River Ranger Districts, only 3% of the operators submit a notice of intent to operate on Federal lands. Of those 3% that are monitored, the Forest has documented adverse impacts to the environment that include, but are not limited to: high banking, excessive sediment, modification of large in-stream habitat structures (boulders), occupation of federal lands longer than 30 days, and sanitation issues (human waste). The cumulative effects of the other 97% of dredgers operating on the Plumas NF are estimated to be at significant levels and causing adverse impacts to water quality, in-stream fish habitat, streambank stability, and aquatic species survival.

  As a result of the high number of operators that do not submit a notice of intent, the Plumas NF recommends the following courses of action:

    1. Increased cooperative enforcement efforts between CDFG field personnel and Forest Service minerals personnel to monitor a

greater number of the 97% of operators that do not submit Notices of Intent.

2. The CDFG modify their regulations to impose suspension or sanctions on mining operations and claims for up to 3 years for operators that do not file Notices of Intent with the Forest Service.

2) Whether suction dredge mining under CDFG's current regulations governing such activities results in deleterious effects to fish;

- Existing suction dredging operations do appear to have deleterious effects to fish. The suction dredging operation documented in Figure 2 is resulting in the downstream effects to fish and amphibians noted in Figure 1. This level of sediment results in deleterious effects to aquatic species in the form of inhibiting the hatching of eggs, development of fry, fingerlings and tadpoles, as well as the survival of adults. These sediment levels also adversely affect the food source (benthic invertebrates) of trout in our fish bearing streams.

  As a result of these deleterious effects to fish noted above, the Plumas NF recommends that the CDFG consider moving the beginning of dredging season on perennial fish bearing waters from the 4th Saturday in May to the 4th Saturday in June.

3) Whether there are changed circumstances or new information available since 1994 regarding suction dredge mining and the environment generally, and whether changed circumstances or new information available since 1994 indicates suction dredge mining under the CDFG's existing regulations is resulting in new significant or substantially more severe environmental impacts than previously considered by the CDFG.

- Since 1994, the Mountain Yellow-legged Frog (MYLF) has remained on our Regional Forester's Sensitive Species list, but it status has been heightened by the U.S. Fish & Wildlife Service (FWS). The FWS has concluded in its status review of listing proposals that the MYLF is warranted for listing, but precluded by higher priority listings. The FWS fully expects the MYLF to be listed under the Endangered Species Act in the near future (within the next 18 months). The Plumas NF is concerned about suction dredging within occupied MYLF streams, as the effects noted in items 1 and 2 above have been documented in occupied streams.

  1. As impacts continue within occupied MYLF streams, the Plumas NF recommends that the CDFG's suction dredging regulations require that operators to submit a Plan of Operations for any operation occurring within a Critical Aquatic Refuge and/or MYLF occupied stream.

  2. For suction dredging operations within occupied MYLF streams, the Plumas NF recommends that the CDFG's suction dredging regulations require a limited operating period (LOP) from May 1st (or beginning of the suction dredging season) to August 30th. This

LOP would significantly reduce adverse impacts to MYLF while still allowing suction dredging operations to continue during part of the year.

If you have any questions regarding the input provided above, please contact George Garcia, WFRP Program Manager at (530) 283-7828.

/s/Maria T. Garcia (for)
ALICE B. CARLTON
Forest Supervisor

cc: Patricia A Krueger
Hilton Cass

Attachment 1 - Impacts from Suction Dredging Operations on the Plumas NF

Figure 1. Sediment impacts from suction dredging on Hopkins Creek, Plumas NF. Sediment impacts fish reproduction (eggs) development (fry, fingerlings) and survival (adults) on this Trout stream. A food source such as the macroinvertebrate community is also impacted by this level of sediment.

Figure 2. Suction dredging operation on Hopkins Creek, Plumas NF. Note large boulder being moved by chain and winch resulting in modification of fish and amphibian habitat.

Figure 3. Suction Dredging Operation on the Little North Fork Middle Fork Feather River. Operator in this photo cut riparian vegetation (alder) from stream bank and dug out a hole in the stream bank behind large boulder for suction dredging access. Stream bank material excavated was moved into channel, modifying in-stream habitat and flows on this trout bearing stream.

Attachment 4 – San Bernardino National Forest Riparian Biological Assessment – Tables 1 and 2

Table 1 – San Bernardino National Forest

Table 1. Summary of Known Occurrences of T/E Riparian Species On and Near the SBNF				
Occurrence Location (Ranger District)	NFS Acreage*		Non-NFS Acreage*	
Shay Unarmored Three-Spine Stickleback				
Shay Creek and Baldwin Lake (MTRD)	634		463	
Sugarloaf Meadow Pond (MTRD)	16		0	
Juniper Springs (MTRD)	12		0	
Arroyo Toad	Breeding	Upland	Breeding	Upland
Bautista Creek (SJRD)	270	384	95	291
Cajon Creek/Wash (FCRD)	326	832	556	1254
Cleghorn Arm/Silverwood (MTRD)	60	72	0	307
Cucamonga Canyon (FCRD)	3	5	21	61
Lower Deep Creek (MTRD)	1156	1860**	3938**	7465**
Deep Creek – Devil's Hole (MTRD)	384	**	0	**
Deep Creek – Hot Springs (MTRD)	133	**	0	**
Deep Creek – Mojave Forks Dam (MTRD)	318	**	13	**
Deep Creek – Summit Valley/Spillway (MTRD)	45	**	3301	**
Deep Creek – Warm Springs (MTRD)	67	**	0	**
Kinley Creek (MTRD)	8	**	0	**
Little Horsethief Canyon (FCRD)	201	**	625	**
Non-FS: Grass Valley Creek (Adjacent to MTRD)	0	**	11	**
Arroyo Toad Critical Habitat				
Bautista Creek – Unit 9 (SJRD)	673		Did Not Calculate	
South Fork San Jacinto River – Unit 9 (SJRD)				
Cajon Wash –Unit 20 (FCRD)	483		Did Not Calculate	
Mountain Yellow-Legged Frog				
City Creek (FCRD)	90		4	
Day Creek (FCRD)	49		3	
East Fork Barton Creek (MTRD)	1		0	
Fuller Mill Creek (SJRD)	48		25	
Indian Creek @ Hall Canyon (SJRD)	46		6	
Mill Creek @ Thurman Flats (FCRD)	24		8	
North Fork San Jacinto River (SJRD)	49		14	
Mountain Yellow-Legged Frog Critical Habitat				
Andreas Canyon – Subunit 3D (SJRD)	109		Did Not Calculate	
City Creek, East and West Fork – Subunit 2A (FCRD)	1268		Did Not Calculate	
Day Canyon – Subunit 1E (FCRD)	635		Did Not Calculate	
East Fork Barton Creek – Subunit 2B (MTRD)	193		Did Not Calculate	
Indian Creek – Subunit 3B (SJRD)	126		Did Not Calculate	
North Fork (of Middle Fork of) Whitewater River – Subunit 2C (FCRD)	74		Did Not Calculate	
North Fork of San Jacinto River – Subunit 3A (SJRD)	823		Did Not Calculate	
Tahquitz Creek – Subunit 3C (SJRD)	217		Did Not Calculate	

Table 1. Summary of Known Occurrences of T/E Riparian Species On and Near the SBNF		
Occurrence Location (Ranger District)	NFS Acreage*	Non-NFS Acreage*
Southwestern Willow-Flycatcher		
Arrastre Creek (MTRD)	3	0
Banning Canyon (FCRD)	28	6
Barton Creek (Owl Site) and Jenks Meadow (MTRD)	<1	17
Bautista Canyon 1-4 (SJRD)	15.7	30.6
Bear Creek #2 and #3 (FCRD)	9	11
Cajon Creek #2 (FCRD)	2	4
Cajon Creek #4 (FCRD)	20	21
Cienaga Seca (MTRD)	9	<1
City Creek (FCRD)	<1	9
Clark's Ranch (MTRD)	46	0
Cold Creek (FCRD)	14	0
College Camp (MTRD)	16	0
Cucamonga Canyon (FCRD)	3	0
Day Creek (FCRD)	26	4
Deep Creek 1 & 2 (MTRD)	31	0
Deer Creek (FCRD and MTRD)	6	0
East Etiwanda Creek (FCRD)	4	9
Forest Falls on Mill Creek (FCRD)	4	16
Green Canyon (MTRD)	4	0
Heart Bar (MTRD)	4	0
Jacoby Canyon (MTRD)	13	0
Jenks Lake (MTRD)	9	0
Keenbrook – Cajon Creek (FCRD)	6	5
Little Bear Springs 1-4 – Holcomb Creek (MTRD)	21	0
Lost Lake (FCRD)	8	0
Rattlesnake Creek 1 & 2 (MTRD)	13	0
Sand Creek (MTRD)	14	0
Santa Ana River/Barton (MTRD)	56	0
Santa Ana River/Crystal Creek (FCRD)	5	11
Seven Oaks (MTRD)	14	0
Sheep Creek (FCRD)	15	0
Terrace Springs (MTRD)	2	0
Thurman Flats Picnic Area on Mill Creek (FCRD)	20	0
Van Dusen Canyon (MTRD)	8	0
Non-FS: Chino Canyon (Adjacent to SJRD)	0	4
Non-FS: Metcalf Creek South (Adjacent to MTRD)	0	3
Non-FS: Mill Creek Gauging Station (Adjacent to the FCRD)	<1	6
Non-FS: Morton Canyon (Adjacent to the FCRD)	0	13
Non-FS: North Fork San Jacinto River (Adjacent to SJRD)	<1	8
Non-FS: Oak Glen (Adjcent to FCRD)	0	6
Non-FS: Waterman Creek #1 (Adjacent to FCRD)	0	12
Southwestern Willow Flycatcher Critical Habitat		
Santa Ana Unit – includes Santa Ana River, Bear Creek, Mill Creek, and Waterman Canyon (MTRD and FCRD)	934	Did Not Calculate
Mojave Unit – includes Holcomb Creek and Deep Creek (MTRD)	527	Did Not Calculate
Least Bell's Vireo		

Table 1. Summary of Known Occurrences of T/E Riparian Species On and Near the SBNF			
Occurrence Location (Ranger District)	NFS Acreage*		Non-NFS Acreage*
Bautista Creek (SJRD)	9		0
Cajon Creek #1 (FCRD)	3		2
Cajon Creek #3 (FCRD)	1		0
Cajon Creek #4 (FCRD)	7		4
Little Sand Canyon (FCRD)	7		14
Lost Lake (FCRD)	8		0
Non-FS: Badger Canyon (Adjacent to FCRD)	0		8
Non-FS: Cable Creek (Adjacent to FCRD)	0		17
Non-FS: Cajon Creek #2 (Adjacent to FCRD)	0		2
Non-FS: Chino Canyon (Adjacent to SJRD)	0		14
Non-FS: Cushenbury Springs (Adjacent to MTRD)	0		22
San Bernardino Kangaroo Rat			
Bautista Creek (SJRD)	272		208
Cajon Wash (FCRD)	314		1403
Lytle Creek (FCRD)	127		536
North Fork San Jacinto River @ Cranston (SJRD)	37		361
Non-FS: Santa Ana River (SBNF Air Tanker Base Administrative Site)	0		8159
San Bernardino Kangaroo Rat Critical Habitat	Designated	Proposed	
Santa Ana River and Wash (Unit 1) (FCRD)	6	0	Did Not Calculate
Lytle/Cajon Creek Wash Unit (Unit 2) (FCRD) *Note: under the proposed revision, most of the SBNF portion of the CH would be dropped*	644	86	Did Not Calculate
San Jacinto River Wash Unit (Unit 3) (includes Bautista Canyon) (SJRD) *Note: under the proposed revision, most of the SBNF portion of the CH would be dropped.*	293	110	Did Not Calculate
Etiwanda Fan and Wash Unit (Unit 4) (FCRD) *Note: under the proposed revision, all of this CH unit would be dropped.*	6	0	
Slender-Horned Spineflower			
Bautista Creek (SJRD)	103		0
Keenbrook/Cajon Wash (FCRD)	20		0
North Fork San Jacinto River @ Cranston (SJRD)	30		30
Non-FS: Devore (Adjacent to FCRD)	0		50
Non-FS: Lytle Creek (Adjacent to FCRD)	<1		187

*Acreages were calculated using GIS layers of mapped habitat polygons. The mapping was accomplished using digital aerial photography and has not been ground-verified for suitability. Thus, these acreages should be considered as approximations.
** Upland arroyo toad habitat was mapped using the 2000 SCCS model as a starting point. The upland model was clipped at a mile from known occurrences. In some cases, the model was edited to fit with what looked like suitable upland habitat. The upland toad habitat for the lower Deep Creek area was not broken out by site.

Table 2 – San Bernardino National Forest

Table 2. Summary of Known T/E Occurrences by District							
Site	UTS	ARTO	MYLF	SWWF	LBVI	SBKR	DOLE

Table 2. Summary of Known T/E Occurrences by District							
Site	UTS	ARTO	MYLF	SWWF	LBVI	SBKR	DOLE
Front Country Ranger District							
Badger Canyon					X*		
Banning Canyon				X			
Bear Creek				X/CH			
Cable Creek					X*		
Cajon Creek/Wash (including Keenbrook)		X/CH		X	X	X/CH	X
City Creek			X/CH	X			
Cold Creek				X			
Cucamonga Canyon		X		X			
Day Creek			X/CH	X			
Deer Creek				X			
Devore							X*
East Etiwanda Creek				X			
Etiwanda Fan						CH	
Forest Falls on Mill Creek				X			
Little Horsethief Canyon		X**					
Little Sand Canyon					X		
Lost Lake				X	X		
Lytle Creek						X/CH	X*
Mill Creek Gauging Station				X*			
Mill Creek				CH			
North Fork (of Middle Fork) Whitewater River			CH				
Santa Ana River/Crystal Creek				X/CH			
Morton Canyon				X*			
Oak Glen				X*			
Santa Ana River				CH		X*/CH	
Sheep Creek				X			
Thurman Flats Picnic Area on Mill Creek			X	X/CH			
Waterman Canyon #1				X*/CH			
Mountaintop Ranger District							
Arrastre Creek				X			
Barton Creek (Owl Site) and Jenks Meadow				X/CH			
Cienaga Seca				X			
Clark's Ranch				X/CH			
Cleghorn Arm/Silverwood		X					
College Camp				X/CH			
Cushenbury Springs					X*		
Lower Deep Creek		X		X/CH			
Deep Creek - Devil's Hole		X		CH			
Deep Creek – Hot Springs		X		CH			
Deep Creek – Mojave Forks Dam		X		X/CH			
Deep Creek – Summit Valley/Spillway		X		CH			
Deep Creek – Warm Springs		X		CH			
Deep Creek				CH			
Deer Creek				X			
East Fork Barton Creek			X/CH				
Grass Valley Creek		X*					
Green Canyon				X			
Heart Bar				X			
Holcomb Creek				CH			
Little Bear Springs – Holcomb Creek				X/CH			

Table 2. Summary of Known T/E Occurrences by District							
Site	UTS	ARTO	MYLF	SWWF	LBVI	SBKR	DOLE
Jacoby Canyon				X			
Jenks Lake				X			
Juniper Springs	X						
Kinley Creek		X					
Metcalf Creek #1				X*			
Rattlesnake Creek 1 & 2				X			
Sand Creek				X			
Santa Ana River @ Barton				X/CH			
Seven Oaks				X/CH			
Shay Creek and Baldwin Lake	X**						
Sugarloaf Meadow Pond	X						
Terrace Springs				X			
Van Dusen Canyon				X			
San Jacinto Ranger District							
Andreas Canyon			CH				
Bautista Creek		X/CH		X	X	X/CH	X
Chino Canyon				X*	X*		
Fuller Mill Creek			X/CH				
Indian Creek @ Hall Canyon			X/CH				
North Fork San Jacinto River			X/CH	X*		CH	
San Jacinto River @ Cranston						X/CH	X
South Fork San Jacinto River		CH					
Tahquitz Creek			CH				
Other SBNF Sites							
Air Tanker Base						X*/CH*	

*=On Non-FS lands within 1-mile of NFS land.
X=species occurs
CH=critical habitat

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File Code: 2600/2800
Date: December 4, 2009

Mark Stopher
Environmental Program Manager
California Department of Fish and Game
601 Locust Street
Redding, CA 96001

Dear Mr. Stopher:

This letter is in response to your request for comments dated October 26, 2009 on the Notice of Preparation of a Draft Subsequent Environmental Impact Report for the State of California suction dredge permitting program. The National Forests of the Pacific Southwest Region (Forests) submitted comments regarding potential impacts of suction dredge to the California Department of Fish and Game in a letter dated December 27, 2007 (Attachment 1) and those issues are still valid. The Forests reviewed your Initial Study, Suction Dredge Permitting Program; Subsequent Environmental Impact Report dated November 2009 and found it to be quite comprehensive, although several Forests have additional comments. The Forests found some additional issues that needed to be addressed and some potential impacts that, based on Forest Service mineral administration experience, appear to be greater than indicated in your study. I have summarized each of the Forests response in Attachment 2.

In conclusion, thank you for this opportunity to provide information for your consideration. Please contact Rich Teixeira, Washington Office Minerals and Geology Mineral Exam Team Leader at (707)562-8965 or rteixeira@fs.fed.us for additional information.

Sincerely,

/s/ Thomas A. Contreras (for)
RANDY MOORE
Regional Forester

Enclosures

cc: Christine Nota
Debra Whitman
Barnie Gyant
Joseph Furnish
Michael Kellett
Rich Teixeira

Tony L Ferguson
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File Code: 2600/2800
Date: DEC 0 4 2009

Mark Stopher
Environmental Program Manager
California Department of Fish and Game
601 Locust Street
Redding, CA 96001

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Sincerely,

Thomas Peters (FOR)

RANDY MOORE
Regional Forester

Enclosures

cc: Christine Nota, Debra Whitman, Barnie Gyant, Joseph Furnish, Michael Kellett, Rich Teixeira, Tony L Ferguson, Tracy Parker

Attachment 4 – San Bernardino National Forest Riparian Biological Assessment – Tables 1 and 2

Table 1 – San Bernardino National Forest

Table 1. Summary of Known Occurrences of T/E Riparian Species On and Near the SBNF				
Occurrence Location (Ranger District)	NFS Acreage*		Non-NFS Acreage*	
Shay Unarmored Three-Spine Stickleback				
Shay Creek and Baldwin Lake (MTRD)	634		463	
Sugarloaf Meadow Pond (MTRD)	16		0	
Juniper Springs (MTRD)	12		0	
Arroyo Toad	Breeding	Upland	Breeding	Upland
Bautista Creek (SJRD)	270	384	95	291
Cajon Creek/Wash (FCRD)	326	832	556	1254
Cleghorn Arm/Silverwood (MTRD)	60	72	0	307
Cucamonga Canyon (FCRD)	3	5	21	61
Lower Deep Creek (MTRD)	1156	1860**	3938**	7465**
Deep Creek – Devil's Hole (MTRD)	384	**	0	**
Deep Creek – Hot Springs (MTRD)	133	**	0	**
Deep Creek – Mojave Forks Dam (MTRD)	318	**	13	**
Deep Creek – Summit Valley/Spillway (MTRD)	45	**	3301	**
Deep Creek – Warm Springs (MTRD)	67	**	0	**
Kinley Creek (MTRD)	8	**	0	**
Little Horsethief Canyon (FCRD)	201	**	625	**
Non-FS: Grass Valley Creek (Adjacent to MTRD)	0	**	11	**
Arroyo Toad Critical Habitat				
Bautista Creek – Unit 9 (SJRD)	673		Did Not Calculate	
South Fork San Jacinto River – Unit 9 (SJRD)				
Cajon Wash –Unit 20 (FCRD)	483		Did Not Calculate	
Mountain Yellow-Legged Frog				
City Creek (FCRD)	90		4	
Day Creek (FCRD)	49		3	
East Fork Barton Creek (MTRD)	1		0	
Fuller Mill Creek (SJRD)	48		25	
Indian Creek @ Hall Canyon (SJRD)	46		6	
Mill Creek @ Thurman Flats (FCRD)	24		8	
North Fork San Jacinto River (SJRD)	49		14	
Mountain Yellow-Legged Frog Critical Habitat				
Andreas Canyon – Subunit 3D (SJRD)	109		Did Not Calculate	
City Creek, East and West Fork – Subunit 2A (FCRD)	1268		Did Not Calculate	
Day Canyon – Subunit 1E (FCRD)	635		Did Not Calculate	
East Fork Barton Creek – Subunit 2B (MTRD)	193		Did Not Calculate	
Indian Creek – Subunit 3B (SJRD)	126		Did Not Calculate	
North Fork (of Middle Fork of) Whitewater River – Subunit 2C (FCRD)	74		Did Not Calculate	
North Fork of San Jacinto River – Subunit 3A (SJRD)	823		Did Not Calculate	
Tahquitz Creek – Subunit 3C (SJRD)	217		Did Not Calculate	

Table 1. Summary of Known Occurrences of T/E Riparian Species On and Near the SBNF		
Occurrence Location (Ranger District)	NFS Acreage*	Non-NFS Acreage*
Southwestern Willow-Flycatcher		
Arrastre Creek (MTRD)	3	0
Banning Canyon (FCRD)	28	6
Barton Creek (Owl Site) and Jenks Meadow (MTRD)	<1	17
Bautista Canyon 1-4 (SJRD)	15.7	30.6
Bear Creek #2 and #3 (FCRD)	9	11
Cajon Creek #2 (FCRD)	2	4
Cajon Creek #4 (FCRD)	20	21
Cienaga Seca (MTRD)	9	<1
City Creek (FCRD)	<1	9
Clark's Ranch (MTRD)	46	0
Cold Creek (FCRD)	14	0
College Camp (MTRD)	16	0
Cucamonga Canyon (FCRD)	3	0
Day Creek (FCRD)	26	4
Deep Creek 1 & 2 (MTRD)	31	0
Deer Creek (FCRD and MTRD)	6	0
East Etiwanda Creek (FCRD)	4	9
Forest Falls on Mill Creek (FCRD)	4	16
Green Canyon (MTRD)	4	0
Heart Bar (MTRD)	4	0
Jacoby Canyon (MTRD)	13	0
Jenks Lake (MTRD)	9	0
Keenbrook – Cajon Creek (FCRD)	6	5
Little Bear Springs 1-4 – Holcomb Creek (MTRD)	21	0
Lost Lake (FCRD)	8	0
Rattlesnake Creek 1 & 2 (MTRD)	13	0
Sand Creek (MTRD)	14	0
Santa Ana River/Barton (MTRD)	56	0
Santa Ana River/Crystal Creek (FCRD)	5	11
Seven Oaks (MTRD)	14	0
Sheep Creek (FCRD)	15	0
Terrace Springs (MTRD)	2	0
Thurman Flats Picnic Area on Mill Creek (FCRD)	20	0
Van Dusen Canyon (MTRD)	8	0
Non-FS: Chino Canyon (Adjacent to SJRD)	0	4
Non-FS: Metcalf Creek South (Adjacent to MTRD)	0	3
Non-FS: Mill Creek Gauging Station (Adjacent to the FCRD)	<1	6
Non-FS: Morton Canyon (Adjacent to the FCRD)	0	13
Non-FS: North Fork San Jacinto River (Adjacent to SJRD)	<1	8
Non-FS: Oak Glen (Adjcent to FCRD)	0	6
Non-FS: Waterman Creek #1 (Adjacent to FCRD)	0	12
Southwestern Willow Flycatcher Critical Habitat		
Santa Ana Unit – includes Santa Ana River, Bear Creek, Mill Creek, and Waterman Canyon (MTRD and FCRD)	934	Did Not Calculate
Mojave Unit – includes Holcomb Creek and Deep Creek (MTRD)	527	Did Not Calculate
Least Bell's Vireo		

Table 1. Summary of Known Occurrences of T/E Riparian Species On and Near the SBNF			
Occurrence Location (Ranger District)	NFS Acreage*		Non-NFS Acreage*
Bautista Creek (SJRD)	9		0
Cajon Creek #1 (FCRD)	3		2
Cajon Creek #3 (FCRD)	1		0
Cajon Creek #4 (FCRD)	7		4
Little Sand Canyon (FCRD)	7		14
Lost Lake (FCRD)	8		0
Non-FS: Badger Canyon (Adjacent to FCRD)	0		8
Non-FS: Cable Creek (Adjacent to FCRD)	0		17
Non-FS: Cajon Creek #2 (Adjacent to FCRD)	0		2
Non-FS: Chino Canyon (Adjacent to SJRD)	0		14
Non-FS: Cushenbury Springs (Adjacent to MTRD)	0		22
San Bernardino Kangaroo Rat			
Bautista Creek (SJRD)	272		208
Cajon Wash (FCRD)	314		1403
Lytle Creek (FCRD)	127		536
North Fork San Jacinto River @ Cranston (SJRD)	37		361
Non-FS: Santa Ana River (SBNF Air Tanker Base Administrative Site)	0		8159
San Bernardino Kangaroo Rat Critical Habitat	Designated	Proposed	
Santa Ana River and Wash (Unit 1) (FCRD)	6	0	Did Not Calculate
Lytle/Cajon Creek Wash Unit (Unit 2) (FCRD) *Note: under the proposed revision, most of the SBNF portion of the CH would be dropped*	644	86	Did Not Calculate
San Jacinto River Wash Unit (Unit 3) (includes Bautista Canyon) (SJRD) *Note: under the proposed revision, most of the SBNF portion of the CH would be dropped.*	293	110	Did Not Calculate
Etiwanda Fan and Wash Unit (Unit 4) (FCRD) *Note: under the proposed revision, all of this CH unit would be dropped.*	6	0	
Slender-Horned Spineflower			
Bautista Creek (SJRD)	103		0
Keenbrook/Cajon Wash (FCRD)	20		0
North Fork San Jacinto River @ Cranston (SJRD)	30		30
Non-FS: Devore (Adjacent to FCRD)	0		50
Non-FS: Lytle Creek (Adjacent to FCRD)	<1		187

*Acreages were calculated using GIS layers of mapped habitat polygons. The mapping was accomplished using digital aerial photography and has not been ground-verified for suitability. Thus, these acreages should be considered as approximations.

** Upland arroyo toad habitat was mapped using the 2000 SCCS model as a starting point. The upland model was clipped at a mile from known occurrences. In some cases, the model was edited to fit with what looked like suitable upland habitat. The upland toad habitat for the lower Deep Creek area was not broken out by site.

Table 2 – San Bernardino National Forest

Table 2. Summary of Known T/E Occurrences by District							
Site	UTS	ARTO	MYLF	SWWF	LBVI	SBKR	DOLE

Table 2. Summary of Known T/E Occurrences by District							
Site	UTS	ARTO	MYLF	SWWF	LBVI	SBKR	DOLE
Front Country Ranger District							
Badger Canyon					X*		
Banning Canyon				X			
Bear Creek				X/CH			
Cable Creek					X*		
Cajon Creek/Wash (including Keenbrook)		X/CH		X	X	X/CH	X
City Creek			X/CH	X			
Cold Creek				X			
Cucamonga Canyon		X		X			
Day Creek			X/CH	X			
Deer Creek				X			
Devore							X*
East Etiwanda Creek				X			
Etiwanda Fan						CH	
Forest Falls on Mill Creek				X			
Little Horsethief Canyon		X**					
Little Sand Canyon					X		
Lost Lake				X	X		
Lytle Creek						X/CH	X*
Mill Creek Gauging Station				X*			
Mill Creek				CH			
North Fork (of Middle Fork) Whitewater River			CH				
Santa Ana River/Crystal Creek				X/CH			
Morton Canyon				X*			
Oak Glen				X*			
Santa Ana River				CH		X*/CH	
Sheep Creek				X			
Thurman Flats Picnic Area on Mill Creek			X	X/CH			
Waterman Canyon #1				X*/CH			
Mountaintop Ranger District							
Arrastre Creek				X			
Barton Creek (Owl Site) and Jenks Meadow				X/CH			
Cienaga Seca				X			
Clark's Ranch				X/CH			
Cleghorn Arm/Silverwood		X					
College Camp				X/CH			
Cushenbury Springs					X*		
Lower Deep Creek		X		X/CH			
Deep Creek - Devil's Hole		X		CH			
Deep Creek – Hot Springs		X		CH			
Deep Creek – Mojave Forks Dam		X		X/CH			
Deep Creek – Summit Valley/Spillway		X		CH			
Deep Creek – Warm Springs		X		CH			
Deep Creek				CH			
Deer Creek				X			
East Fork Barton Creek			X/CH				
Grass Valley Creek		X*					
Green Canyon				X			
Heart Bar				X			
Holcomb Creek				CH			
Little Bear Springs – Holcomb Creek				X/CH			

Table 2. Summary of Known T/E Occurrences by District							
Site	UTS	ARTO	MYLF	SWWF	LBVI	SBKR	DOLE
Jacoby Canyon				X			
Jenks Lake				X			
Juniper Springs	X						
Kinley Creek		X					
Metcalf Creek #1				X*			
Rattlesnake Creek 1 & 2				X			
Sand Creek				X			
Santa Ana River @ Barton				X/CH			
Seven Oaks				X/CH			
Shay Creek and Baldwin Lake	X**						
Sugarloaf Meadow Pond	X						
Terrace Springs				X			
Van Dusen Canyon				X			
San Jacinto Ranger District							
Andreas Canyon			CH				
Bautista Creek		X/CH		X	X	X/CH	X
Chino Canyon				X*	X*		
Fuller Mill Creek			X/CH				
Indian Creek @ Hall Canyon			X/CH				
North Fork San Jacinto River			X/CH	X*		CH	
San Jacinto River @ Cranston						X/CH	X
South Fork San Jacinto River		CH					
Tahquitz Creek			CH				
Other SBNF Sites							
Air Tanker Base						X*/CH*	

*=On Non-FS lands within 1-mile of NFS land.
X=species occurs
CH=critical habitat

Attachment 1

The following is a list of suction dredging issues that each National Forest in the Pacific Southwest Region discussed. I have summarized each of the Forests response in an attachment.

Angeles National Forest

The Angeles National Forest comments and recommendations contained in the December 27, 2007 letter are still accurate though we have new information to include in our comments.

Potential post-fire hydrologic and geomorphic impacts associated with the Station fire (and to a lesser extent the Morris fire) will most likely materialize over the next couple of years within the four watersheds of the Forest. These potential mud flows and debris flows are expected to result in significant impacts to stream courses and the biota dependent upon them. In cooperation with California Department of Fish and Game (CDFG), U.S. Fish and Wildlife Service (USFWS), and the U.S. Geological Survey, the Forest is engaged in species salvage operations where listed species are being brought into captivity at local zoos until such a time as the watersheds recover. We are hoping that this drastic action will assist in promoting the long-term survival of these species. Additionally invasive species detection surveys are being conducted and the Forest plans to act aggressively to keep these invaders in check. Lastly, the Forest has issued a Closure Order for approximately one quarter of the Forest to safeguard human life and also minimize soil disturbance within the watershed to promote watershed recovery.

The topography of the Angeles National Forest causes human activities to be concentrated in the river bottoms. The canyons are steep-sided and narrow from a human use perspective which causes a higher probability of user group conflict and increases potential for resource damage. Every recreational use imaginable was represented in the East Fork of the San Gabriel River prior to the enactment of the State law prohibiting the issuance of suction dredging permits and suspending the operation of suction dredges permitted for use under the program. This concentrated use results in extreme pressure on the natural resources of the area and on public service providers. High numbers of Forest users involved in suction dredge mining, prolonged unauthorized occupancy, and other dispersed recreational opportunities along the East Fork caused parking issues, dumping and trash issues, health and safety issues, overuse of a picnic area located adjacent to the River, and resource damage. With this as background, the Forest suggests that the State has underestimated the incremental demand associated with suction dredge mining on public services and transportation/traffic. Please pass along our recommendation that each stream reach identified in the regulations be evaluated based on local characteristics and projected use.

Lastly, we would like to suggest that the State consider realigning their regulations that pertain to the Angeles National Forest to recognize the inherent conflict with federal law, namely the Watershed Withdrawal Act of 1928. Although the State asserts that nothing in the regulations authorize activities that are otherwise prohibited, we have witnessed the confusion of the public

when they figure out that large portions of the Angeles National Forest have been withdrawn from mineral entry and are not open to suction dredge mining. We are further put at a disadvantage to enforce federal law owing to lack of enforcement authority. The easiest solution to avoid public confusion and anger would be for the State to incorporate the restrictions of the Federal law within the State regulations.

Eldorado National Forest

We reviewed the 2007 Regional Office comments to the State for accuracy and to determine if there are any new issues that should be discussed in the upcoming study and SEIR. We would like to add the following discussion of known effects to aquatic species on the Eldorado National Forest.

On the Rubicon River, aquatic surveys of the past few years for the relicensing of the Middle Fork American Project have concluded that the best population of foothill yellow-legged frogs (*Rana boylii*) in the project lies near a site where suction dredge mining occurs. The population is already reduced due to the effects of irregular stream flows from the hydropower project on the Middle Fork American River. The Rubicon River tends to have ideal flows for foothill yellow-legged frogs but suction dredging may be affecting populations where it is occurring during critical periods. Gravel and rocks can be moved many feet during suction dredging, and this is the same substrate where egg masses are attached or where tadpoles reside. Survival of eggs or tadpoles where disrupted at their habitat site is unlikely. In dry years, most egg masses hatch by the beginning of June, although in wetter years, this time period could be much later, even into July.

We have observed effects of suction dredging upon foothill yellow-legged frogs at Camp Creek where foothill yellow-legged frog egg masses have been observed. Egg masses occurred in the same pool where suction dredging was later observed. It is possible that egg masses were destroyed or tadpoles were buried by this activity. The early summer appears to be the critical time period since later in the summer the older tadpoles may be able to move out of the way from a localized disturbance from suction dredging.

Both the Rubicon River and Camp Creek also support western pond turtles (*Clemmys marmorata*). The juvenile and adult life stages could be disturbed by suction dredging, although it is most likely that western pond turtles would move out of the way from such disturbance. Downstream water turbidity reduces high water quality.

The Eldorado NF Fisheries Biologist also suggested that CDFG use a start date on streams with Foothill Yellow-Legged Frogs based on the water year since the amount of water flow (water year) is a determining factor on when the eggs hatch and the tadpoles are mature enough to get out of the way of suction dredge intake hoses.

Inyo National Forest

The Inyo NF felt the issues are adequately discussed in the subject documents.

Lassen National Forest

The Lassen National Forest streams provide habitat to State and federally listed anadromous fish (steelhead and Spring-Run Chinook salmon and other aquatic life). We are concerned about any potential negative impacts resulting from suction dredge activities on the Forest.

Plumas National Forest

The Plumas National Forest would like to reiterate that most common issues related to suction dredging are camping and residential occupancy, which requires significant commitments of time from the Forest Service mineral administrators. The Forest would also like to see a requirement that large rocks or boulders (e.g. larger than three feet in diameter) that are moved by mechanized equipment during suction dredging be replaced in their original position to minimize impacts to stream stability and aesthetics.

In response to the Region's request for comment on the Initial Study Suction Dredge Permitting Program Subsequent Environmental Impact Report, the Plumas National Forest included two documents that are included in this letter: 1) Plumas National Forest letter dated December 6th, 2006 (Attachment 3) comments to the California Department of Fish and Game (CDFG) Suction Dredging Regulations and impacts from resulting mining activities on the Plumas National Forest; and 2) photographs of effects to habitat by dredging activities, Plumas National Forest memo dated July 17th, 1997 with (Attachment 4). The Plumas NF also include a paper of "Effects of Suction Dredging on Streams: A review and Evaluation Strategy" dated, July 14, 1995 in hardcopy that is available upon request.

In 1997 the Forest responded to a Regional request on Suction Dredging Activities, the following is a summary of these comments, and includes some additional new information. Those comments are in the hard copy addressed to Hilton Cass, Regional Mining Geologist, dated July 17, 1997.

In addition, the Plumas National Forest proposes the following wild trout streams should be closed to suction dredge mining or at a minimum implement a season of use (to protect fish spawning habitat and young of the year within spawning gravels) in the following drainages: Yellow Creek (Plumas Co.), Nelson Creek (Plumas Co.), and Middle Fork of the Feather River (Plumas and Butte Co.): Class B (Open dredging from July1 through August 31) or Class C (open dredging from July 1 through Sept. 15th).

Section 5.5.9 (pg. 19), Timing: The Forest recommends a season of use to protect the California red-legged frog (USFWS Federally listed as Threatened), mountain yellow- legged frog (USFWS Candidate Species) and the foothill yellow-legged frog (USFS Sensitive Species).

The Plumas National Forest recommends the following streams be closed to suction dredge mining. No dredging should be permitted at any time (Class A) within the following drainages because of known populations of the California red-legged frogs; French Creek, Jack's Creek, Pinkard, (Butte County) and Little Oregon Creek (Yuba County), and within the following drainages because of known populations of the mountain yellow-legged frogs; Boulder, Lone Rock, Pierce, West Branch Lights Creek, Rowland, Clark's, Grizzly Creek, Cat, Dark Ravine, Big Ravine, South Fork Rock Creek, Willow Creek, Sulfur, Sawmill Tom, Cooks, Wolf Creek , (Plumas Co.), Pine Grove Creek, Rabbit, Potosi, Slate and tributaries (Plumas/Sierra Counties), Lower Mill Creek, Fall River (Butte Co.) ,Upper Middle Fork Feather River, Gold Run, (Sierra/Plumas Co.).

The Plumas National Forest recommends that at a minimum a season of use as described below be implemented to reduce effects to these TES amphibian species. The Plumas National Forest has a few streams with mountain yellow-legged frogs (USFWS candidate species), as described above; and numerous streams with known populations of foothill yellow-legged frogs (Forest Service sensitive species), as identified below. Suction dredging has the potential to impact these populations. In previous comments submitted by Plumas NF for suction dredging, a limited operating period was suggested to help protect the frogs. Information we have obtained since those comments were submitted indicates the limited operating period suggested may be insufficient to protect vulnerable life stages of frogs. In streams occupied by foothill yellow-legged frogs, we recommend that season of use for suction dredging begin after September 1st and extends no longer than March 31st, unless surveys show there are no foothill-yellow legged frogs in that section of stream. Foothill yellow-legged frogs metamorphose from tadpoles to frog metamorphs in one season. Beginning the season of use late in the summer will ensure that most tadpoles have reached a life stage less vulnerable to suction dredging. In streams occupied by mountain yellow-legged frogs, we recommend that suction dredging not be allowed. Unlike foothill yellow-legged frogs, mountain yellow-legged frogs usually take two seasons to mature, so there are tadpoles present in streams year-round. Because mountain yellow-legged frogs are a candidate species for listing under the Endangered Species Act, caution is warranted. A season of use starting after September 1st and extending no longer than April 30th, would better protect mountain yellow-legged frog tadpoles from impacts from suction dredging than current regulations, but a limited season of use would not fully protect frogs.

At a minimum; the Plumas National Forest recommends that a season of use (September 1st – March 31st) be implemented for streams with known populations of foothill yellow-legged frogs: Butte County - Concow, Dogwood, Magalia, Pine Cluster, Pulga, American House Ravine, Barnards Diggings, Bean, Bear Ranch, Carpenter, Flea Valley, Frazier Cabin, Grizzly, Hunters Ravine, Kanaka Creek, Little North Fork Feather River; Plumas County/Butte County - Indian Creek, Meadow Valley Creek, Spanish Creek, McNair Meadow, Middle Fork of the Feather River, North Fork of the Feather River, Little North Fork of the Feather River, South

Fork Feather River, South Fork Rock Creek; Plumas/Sierra Co's - Slate Creek and tributaries, Rock Creek, Onion Creek, Oroleve Creek, Valley Creek, Woodleaf Creek; Yuba County - Yuba River.

In addition, there is one Congressionally-designated Wilderness within the Plumas National Forest that is withdrawn from mineral. The Buck's Lake Wilderness also is within the Buck's Critical Aquatic Refuge and the mountain yellow-legged frog (*Rana muscosa*) and foothill yellow-legged (*Rana boylii*) frogs are found within these areas. In addition; the Lake's Basin Recreation Area (which is on both the Plumas NF and the Tahoe NF) is within the Lakes Basin Critical Aquatic Refuge and the Mountain yellow-legged frog (*Rana muscosa*) is found within this area. All streams within the Buck's Lake Wilderness and the Lakes Basin Recreation Area should be classified as closed to dredging at all times.

Other general comments:

Please clarify that the definition of fish includes all biological management indicators (BMI) such as benthic macroinvertebrates and amphibians (all life stages).

Section 5.5.10 – Encampments (pg. 20): Sanitation and lack of restroom facilities, and potential for disposal of human waste adjacent to stream, and contamination of streams.

Page 50, discussion of impacts to wildlife, include a discussion on effects to amphibians by removal of LWD through dredging practices.

Safety issues for anglers and other recreational users are not addressed. There are large deep holes caused by dredging (example Chip's Creek on the NFFR – a hole that is approximately 4 feet in diameter and over 5 feet deep), also cables and other equipment in the rivers that can be hazardous to anglers and recreationists.

<u>San Bernardino National Forest</u>

The following recommendations are clarifications to that letter to protect threatened, endangered, and sensitive species on the San Bernardino National Forest in regard to suction dredging activities:

<u>Forest-wide:</u>

1. Recognize that the San Bernardino National Forest has newly designated wilderness on the San Jacinto Ranger District in addition to areas that were recommended to be wilderness as identified in the 2005 Land Management Plan. Suction dredging should not be allowed in these special designation areas; such as research natural areas, wilderness areas, etc.

2. In order to provide protection to known federally-endangered riparian bird breeding activities, please identify the need for miners to contact the Forest Service prior to any

suction dredging activities proposed on the San Bernardino National Forest. This will allow communications with the miners to coordinate performance of dredging operations outside of the breeding season for these species. If possible, please accomplish this through the CEQA process and subsequent implementation of the proposed action.

Mountaintop Ranger District:

1. Please exclude suction dredging from any perennial or intermittent water source that occurs on the Mountaintop Ranger District, to minimize impacts to know occurrences, critical habitat, and suitable habitat for federally threatened, endangered, and sensitive species.

San Jacinto Ranger District:

1. Please exclude suction dredging from streams that were designated as Critical Biological Zones in the 2005 Land Management Plan. This includes Bautista Creek, Fuller Mill Creek, and North Fork San Jacinto River.

2. The 2008 Riparian Biological Assessment (Attachment 4) for ongoing effects to seven listed riparian/aquatic species contains all known occurrences and critical habitat of threatened and endangered species on the Forest by Ranger District (see Attachment 4 - Table 2). In order to protect these species, we recommend that streams that are identified on this list as occupied or critical habitat for mountain yellow-legged frog, arroyo toad, San Bernardino kangaroo rat, and slender-horned spineflower be excluded from suction dredging.

3. The Forest requests that suction dredging be excluded from any perennial or intermittent water sources that are identified in the above bullet statement.

Front Country Ranger District:

1. Please include the requests made in a letter addressed to the California Department of Fish and Game dated December 27, 2007.

2. To protect Forest Service Sensitive listed fish species, Santa Ana speckled dace, please exclude suction dredging from Plunge Creek.

3. The 2008 Riparian Biological Assessment for ongoing effects to seven listed riparian/aquatic species contains all known occurrences and critical habitat of threatened and endangered species on the Forest by Ranger District (see Attachment 4 - Table 2). In order to protect these species, we recommend that streams that are identified on this list as occupied or critical habitat for mountain yellow-legged frog, arroyo toad, San Bernardino kangaroo rat, and slender-horned spineflower be excluded from suction dredging.

4. To protect the habitat in the Santa Ana River, please consider excluding it from suction dredging. The Santa Ana River has been identified as a suitable location to re-establish populations of native fish including the endangered Santa Ana Sucker.

Shasta-Trinity National Forest

The last couple years has seen a drastic increase in the number of suction dredges in operation in Trinity County. One small creek in particular, Dutch Creek has a claim that is owned by an operator that leases rights out to dredgers. This creates a situation where multiple dredging operations can effectively take place on one claim. Dutch Creek is small (2 cubic feet per second (CFS) summer base flow and average wetted channel width of 8 feet) and having multiple mining operations on one claim has really altered the particle size distribution. Gravels are becoming scarce as mining has created geomorphic instability and allowed the gravels to be transported downstream to the mainstem Trinity River. This has resulted in an abundance of boulders and a lack of gravels. The creek has also become entrenched within and below the mining activity. With the creek effectively disconnected from its floodplain the channel acts mainly as a transport pathway for bedload and depositional (spawning) areas are hard to come by. This creek serves as spawning and rearing areas for winter steelhead, coho, and fall-run chinook. Canyon Creek has also been heavily impacted by suction dredge mining. This creek is listed as a Tier 1 watershed and is also listed as a key watershed and supports winter and summer steelhead, coho, and spring and fall chinook. The North Fork Trinity River and its largest tributary the East Fork North Fork Trinity River are also listed as a key watershed. Suction dredge mining operations here are adversely impacting anadromous fish. The North Fork Trinity River is one of the top summer-run steelhead streams in California and measures should be taken to insure that they are protected. In addition, this stream supports spring and fall chinook, winter steelhead, and coho. The New River is the single largest producer of summer run steelhead in California and is also listed as a key watershed. Suction dredge mining has occurred extensively here and is impacting summer and winter steelhead and spring and fall chinook. There are countless other creeks that are impacted from suction dredge mining in Trinity County as well. The Trinity River watershed is an incredible fisheries resource and suction dredge mining appears to be hampering efforts to recover SONCC Coho. Suction dredge mining in any waters that have anadromous fish within the Trinity River watershed should be evaluated for impacts on those fisheries. Currently, our fisheries program is in the planning phases for gravel injection and large woody debris placement for several creeks to mitigate for lack of suitable size spawning gravels.

In addition to the previously listed Trinity River tributaries, Soldier Creek, Hayfork Creek, Deadwood Creek, Rush Creek, Brown's Creek, Reading's Creek, Big French Creek, and Manzanita Creek also host significant anadromous fisheries represent the bulk of our creeks that support anadromous fish and have had recent suction dredge operations.

Other impacts that have not been mentioned are that suspended sediment: (1) increases daytime water temperatures, this is important to note as most of our creeks temperatures during midsummer approach the threshold of concern (TOC) value of 67 F for salmon; (2) Suspended sediment increases the mobility of waterborne pathogens; (3) Turbidity decreases light levels reaching the stream bottom thereby inhibiting primary productivity of the aquatic system. Many types of aquatic macroinvertebrates utilize aquatic vegetation as a primary food source and in turn many anadromous juveniles utilize these bugs as food.

Stanislaus National Forest

We would like to commend the agency for its thorough consideration of the resources potentially affected by suction dredging and the extensive use of literature to support the rationale for establishing significance.

We would like the SEIR to additionally consider the impact of suction dredging on reproductive success of the foothill yellow-legged frog, particularly as pertains to early season breeding activity. In late spring, male foothill yellow-legged frogs congregate near suitable breeding habitats where individuals establish and defend territories (Wheeler and Welsh 2008) and employ calling to entice a mate. MacTague and Northern (1993) reported a majority of calling for mates involved underwater vocalizations; however, Davidson (199) reported calling also occurred above water. We believe the early season operation of dredges has the potential to disrupt breeding activities in two primary ways. The presence of dredgers in or near suitable breeding habitat during the breeding season may result in regular disturbance of males which may cause them to abandon preferred calling locations which may have social implications in frog mating and may result in impaired reproductive success as described in Wheeler and Welsh (2008). The operation of dredges may interfere with the vocalizations of males and impact breeding success since the vocalizations are used to attract suitable mates. On the Stanislaus National Forest, dredging occurs in several locations where the population size is believed to be small and the dredging impacts that may be affecting these occurrences may have broader implications relative to long term viability of the populations. We recommend that the season of operation for streams with known populations of the frog start on or later than June 15 to mitigate these potentially significant impacts. Since surveys have not covered all streams potentially affected by suction dredging, we also recommend that the season of use be adjusted accordingly should additional populations of the frog be discovered in the future.

The Stanislaus NF would like CDFG to provide a process for the Forest Service to provide feedback to CDFG regarding start and end dates or closures for stream reaches. Monitoring of sensitive species may indicate trends in populations and adjustments in the suction dredging season may be warranted.

Tahoe National Forest

The issues described in DFG's SEIR and the Initial Study adequately addresses the issues surrounding the controversy of suction dredging, except for the following items:

1. Suction dredging utilizes mechanized equipment; so an approved Plan of Operations is necessary for suction dredging activity on Forest Service lands. Many adverse impacts of suction dredging can be mitigated by compliance with Conditions of Approval.

2. Vehicles, trailers and suction dredges can introduce and spread noxious weeds, including aquatic weeds, to the riparian ecosystem.

3. Encampment, which is the act of setting up a physical living area, involves activities that can be deleterious to riparian habitat, aquatic resources, and water quality. The adverse impacts of encampment include:
    a. Unauthorized roads and/or trails to the camping area;
    b. Compaction of the soil on the road, camp and stream bank;
    c. Introduction and spread of noxious weeds;
    d. Removal of riparian vegetation;
    e. Lack of adequate sanitation;
    f. Disposal of human waste and garbage on land and into water;
    g. Contamination of domestic water supplies;
    h. Inadequate fuel storage;
    i. Soil erosion;
    j. Noise from dredges could adversely affect forest sensitive wildlife species;
    k. Abandoned equipment and vehicles;
    l. Unauthorized permanent structures; and
    m. Unauthorized occupancy.

The potential impacts of suction dredging are *more* than was described in the CDFG Initial Study. For example, Section XIII, of the Initial Study, Public Services, does not adequately represent the adverse impact of dredging on the Forest Service Law Enforcement work force and the Department of Fish and Game Wardens.

Section XIV. Recreation states that there is a Less-than-Significant Impact to recreational facilities. Suction dredgers on the Tahoe NF do contribute to an increase in campsites being utilized, often for the entire summer.

Section XV. Transportation/Traffic states that there is a Less-than-Significant Impact to inadequate parking capacity. The Tahoe NF has reached full parking capacity on the Highway 49 Scenic Corridor due to suction dredgers requesting to camp near their claim.

The Tahoe NF does not believe that the current CDFG suction dredging regulations are adequate. The Tahoe NF does not have time during this initial comment period to adequately describe

which suction dredge regulations are inadequate; however, Tahoe NF Fisheries Biologist prepared the following comment:

Suction dredging overlaps the habitats of both foothill yellow-legged frog (*Rana boylii*) and rainbow trout (*Oncorhynchus mykiss*) in the following streams, Duncan Creek, North Yuba, Downie River, North Fork of the Middle Fork and Eldorado Canyon Creek. The timing of spawning for rainbow trout in the above watersheds occurs from February through May. For foothill yellow-legged frogs on the Tahoe National Forest, breeding and egg laying usually await the end of spring flooding and may commence any time from mid-March to May, depending on local water conditions. The breeding season at any locality is usually about two weeks for most populations. Based on known occupancy and habitat, the Tahoe National Forest is in agreement with the Plumas National Forest, which states in the Forest Service December 17, 2007 letter that "Due to the deleterious effects seen to fish and amphibian, specifically in the form of inhibiting the hatching of eggs, development of fry, fingerlings and tadpoles, and the survival of adults, as well as the sediments levels also adversely affect the food source (benthic invertebrates) of trout in our fish bearing streams, we request that consideration be granted for moving the beginning of dredging season on perennial fish bearing waters from the 4th Saturday in May to the 4th Saturday in June.

USDA United States Department of Agriculture | Forest Service | Pacific Southwest Region

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File Code: 2600/2810
Date: DEC 27 2007

California Department of Fish and Game
Attn: Suction Dredge Mining
1416 Ninth Street
12th Floor
Sacramento, CA 95814

Dear Sirs:

This letter is in response to your public notice of October 19, 2007, seeking information on suction dredge mining in California. The National Forests of the Pacific Southwest Region have collected much information on suction dredging operations over the past several years. Attached for your convenience and consideration is a compact disc that contains maps, photographs, memo's and monitoring reports prepared by Forest Service personnel that document their observations on suction dredging within the National Forests. I am also attaching a table of contents for the compact disc.

Environmental Impacts of Suction Dredging

The adverse impacts of suction dredging generally fall under the following descriptions:

- Suction dredging can leave piles of loose gravels which attract spawning fish but are inherently unstable resulting in loss of eggs and redds when these loose gravels are displaced in higher stream flows.
- Every effort should be made to ensure suction dredge mining activities do not jeopardize the continued existence of listed species or adversely modify critical habitat.
- Suction dredging can raise the turbidity and increase suspended sediment, particularly when more than one suction dredging operation is occurring in a short length of spawning habitat.
- Chronic disturbance of fishes creates a significant impact by moving organisms to less favorable habitats. This is especially critical in summer when temperatures reach 65 – 70° F. Even minor disturbances form dredging reduces the carrying capacity of aquatic organisms during times of increased natural stress, e.g. water temperature.
- Anadromous lamprey (Pacific and river) are particularly susceptible to dredging since ammocoetes spend up to five years in streams before emigration. The ammocoetes preferred habitat is fines and detritus, making them extremely vulnerable to dredging.

- Freshwater mussels are extremely susceptible to dredging and are imperiled species in California.
- Studies have determined that dredging causes the remobilization of mercury causing mercury to be released to the environment.
- Suction dredging can cause changes in stream channel geomorphology leading to stream channel instability.
- Disturbance to riparian vegetation, downed woody debris and large rock/boulders outside the wetted stream surface is created by high-banking, camping, trail and access route creation.

Suction Dredging Under Current California Department of Fish and Game Regulations

Most National Forests have reported adverse environmental impacts to fish, amphibians, and invertebrates from suction dredging on rivers and streams that are currently open to suction dredging under a California Department of Fish and Game (DFG) permit. Many of these impacts can be addressed by modifying the DFG's classification of the stream and adding language to the regulations to provide better surface resources protection. Please consider the following general recommendations:

- The number of dredges (and sizes) within various reaches (concentration) of waterways have potential to adversely effect through cumulative effects.
- The number of hours each dredge is allowed to operate effects how much material (cu.yds.) potentially is moved. Perhaps limited hours of operation would help in reduction of volume moved as well as with other user conflicts (for example, fisherman, swimmers etc).
- Regulation should define how much of the stream bed can be impacted by dredge holes or piles to help alleviate impacts (for example, dredge piles should not extend more than 1/4 of the wetted channel width).
- Permit limitations on high-banking and trail and access-building in riparian areas outside the wetted stream perimeter would greatly improve water quality/aquatic habitat.
- The use of winches is common and stream alteration permits are rarely applied for or enforced. Most dredgers think that if boulders are not *removed* from the wetted stream surface, a permit is not required. Strong language in the dredge permit that defines when an alteration permit is required may help.
- Human sanitation issues are not addressed in current regulations.
- Fuel storage language as well as fueling requirements can help prevent accidental spills.

Suction Dredging in Water Quality Limited Segments, Clean Water Act Section 303(d) listed waters:

On NFS lands in California many streams are currently listed as impaired waters under Section 303(d) of the Clean Water Act. In those cases where the source of the impairment is sediment, or habitat degradation, the Forest Service is required to improve those waters to meet State water quality standards. In almost all cases, suction dredging is unlikely to be compatible with our Clean Water Act responsibilities. However, individual operators may still obtain approval for their operations, but only when their plan of operations includes steps to result in a net improvement to instream or riparian resources. The local Regional Water Quality Control Board performs the evaluation of the plan of operations and indicates whether it meets State water quality objectives. The Forest Service can not approve a plan of operations without a 401 certification from the State.

In addition, please consider the following specific comments from the National Forests:

Klamath National Forest and Six Rivers National Forest

In November, 2004, the Forest Supervisors for the Klamath National Forest and the Six Rivers National Forest shared with your office via letter their concerns with DFG's classification of the streams of the Klamath River system. Specifically, the Forest Supervisors pointed to overlaps between the periods allowed for suction dredging and the spawning periods and egg-alevin developmental phases for coho, Chinook salmon, steelhead, green sturgeon, and lamprey. The letter makes recommendations on modifying the stream classifications to reduce the potential for adverse impacts. Those concerns and recommendations are still valid. A copy of that letter and supplemental information is included on the attached compact disc.

Plumas National Forest

On the Mt. Hough and Feather River Ranger Districts, the Forest has documented adverse impacts to the environment that include, but are not limited to: high banking, excessive sediment, modification of large in-stream habitat structures (boulders). The cumulative effects are estimated to be at significant levels and causing adverse impacts to water quality, in-stream fish habitat, streambank stability, and aquatic species survival. Please see the attached photos within the enclosed compact disc of suction dredging sites on **Hopkins Creek** and the **Little North Fork Middle Fork Feather River** for illustration.

Due to the deleterious effects seen to fish and amphibian, specifically in the form of inhibiting the hatching of eggs, development of fry, fingerlings and tadpoles, and the survival of adults, as well as the sediment levels also adversely affect the food source (benthic invertebrates) of trout in our fish bearing streams, we request that consideration be granted for moving the beginning of dredging season on perennial fish bearing waters from the 4th Saturday in May to the 4th Saturday in June.

Mountain Yellow-legged frogs (*Rana muscosa*) occur within many of the streams and rivers within the Plumas National Forest. Due to the same concerns as stated above, for suction dredging operations within occupied mountain yellow-legged frog streams or within designated critical aquatic refuges, we recommend that the DFG's suction dredging regulations require a limited operating period (LOP) from May 1st (or beginning of the suction dredging season) to August 30th. This LOP would significantly reduce adverse impacts to mountain yellow-legged frog while still allowing suction dredging operations to continue during part of the year.

The Plumas National Forest is updating their GIS layer for mountain yellow-legged frog and will be available for your use by February, 2008.

Stanislaus National Forest

The Stanislaus National Forest has one of the largest known remaining populations of foothill yellow-legged frog (*Rana boylii*) within national forest lands. Suction dredging overlaps the habitats of both foothill yellow-legged frog and western pond turtle (*Clemmys marmorata pallida*), in the following streams: **Hells Hollow Creek, Big Creek, Bean Creek, Bull Creek, Rose Creek, South Fork Stanislaus River, and the North Fork Tuolumne River**. Local observations on **Rose Creek** confirm that habitat impacts are occurring which includes changes in water flow regimes and sediment regimes. Dewatering has been noted as the streamflow is directed down the sluice box that are occasionally or historically occupied by tadpoles. Dewatering may expose the tadpoles to an unnatural condition and increase the risk for predation. The stream channel has been modified to accommodate the mining equipment and to expose bedrock contact areas, which is the same areas where oviposition occurs. The change in water depth and velocity is also impacting oviposition. Frequent "turnover" of the streambed has been noted, thus the substrates may not have the ability to be colonized and develop the assemblage of algae in the quantity required for foraging by tadpoles.

Two other streams, **Gentry Gulch and Halls Gulch**, are within the range of the limestone and Hells Hollow salamander; however, surveys specific to detecting these species have not been conducted to date. Other primary habitat for the Hell Hollow salamander and limestone salamander is along the **Merced River**, which is a known area for suction dredging. It is unclear what impacts suction dredge mining has on limestone salamander (*Hydromantes brunus*) and Hell Hollow slender salamander (*Batrachoseps diabolicus*); however, since these species are limited in distribution, please consider modifying or reclassifying the streams where they exist. The Stanislaus National Forest has the details on the forest.

Hells Hollow, Big, Bean, and **Bull Creeks** provide suitable habitat for California red-legged frog (*Rana aurora draytonii*), as do portions of the other streams listed above.

Angeles National Forest

We recommend the continuation of "Class A" designation for portions of the San Gabriel River System. We also request that you consider closing the entirety of the **East Fork San Gabriel River** to suction dredge mining based on cumulative impacts within the watershed having deleterious effects to aquatic biota. Aquatic biota within the East Fork San Gabriel include Santa

Ana sucker (*Catostomus santaanae*), Santa Ana speckled dace (*Rhinichthys osculus ssp*), arroyo chub (*Gila orcutti*), mountian yellow-legged frog (*Rana muscosa*), and western pond turtle (*Clemmys marmorata pallida*). Hernandez (1997) conducted surveys in the East Fork San Gabriel and documented the absence of young of the year fish and recommended a seasonal closure to suction dredging. More recent field surveys on the East Fork San Gabriel found evidence of an extended spawning period indicating that a protracted spawning period is present in the stream (A. Backlin, U.S. Geological Survey, Personal Communcation). Santa Ana sucker fry in the West San Gabriel were found exclusively in edgewater habitat over silt at depths of less than 17cm where there was no measurable flow (Haglund and Baskin 2002). Creek bed alterations due to current suction dredging activities preclude edgewater habitat.

Suction dredge mining also currently alters the stream channel of the East Fork San Gabriel by building up rock dams to create large pools for floating equipment. A survey conducted in 1997 over a 3.8 mile stretch of East Fork San Gabriel from **Cattle Canyon** to **Allison Gulch** resulted in a count of 256 suction dredge holes in the river, and 65 mining holes associated with high-banking along the banks (Hernandez 1997).

Two major fires have burned in the East Fork San Gabriel watershed and resulted in impacts to the hydrology of East Fork San Gabriel. These fires include the Williams Fire 2002 and the Narrows Fire 1997. Invasive plants including tamarisk (*Tamarix spp.*) and eupatory (*Ageratina Adenophora)* have become established in the East Fork San Gabriel and are now well distributed along the stream channel. In May 2000, the Total Maximum Daily Load (TMDL) for garbage in East Fork San Gabriel was established. The TMDL was based on estimates of 8000 people visits/day during the summer generating approximately two hundred 32 gallon bags of uncontained trash in and adjacent to the creek each weekend day.

In **Big Tujunga**, there is a similar concern about cumulative impacts to aquatic biota. The biota includes Santa Ana sucker, Santa Ana speckled dace, arroyo chub, and arroyo toad (*Bufo californicus*). Recreation use within Big Tujunga is high. Water withdrawal and recent drought have left the river in a multiple pool state every summer, hence great concern for take on the amphibians or fish remaining in each pool. Invasive bullfrogs continue to impact the fisheries resource. White sweet clover (*Melilotus alba*) and Arundo donax is well established and pervasive in Big Tujunga Watershed. Highbanking has been documented within Big Tujunga as well.

Based on the cumulative impacts on the East Fork San Gabriel and Big Tujunga, we request you consider a change of status to Class A for suction dredge mining.

<u>San Bernardino National Forest</u>

The San Bernardino National Forest has identified a need to close **Lytle Creek (below Miller Narrows)** to suction dredging due to the presence of the Santa Ana speckled dace which is threatened with extinction in the watershed due to many contributing factors. Due to the low water levels in this area, fish are concentrated in a few pools in the summer months and substantial take could occur when suction dredging takes place. We have learned about the

significance of this population in the last few years as a result of a range-wide assessment and FERC relicensing.

The San Bernardino National Forest has identified a need to close **Cajon Creek (below Highway 138)** to suction dredging due to the presence of and threats to arroyo toads and Santa Ana speckled dace. The speckled dace population and threats have really come to light in a recent range-wide assessment and numerous damaging projects such as highway and railroad expansion. Suction dredging and associated disturbance of stream banks will result in take of dace and potential take of arroyo toads. The arroyo toad population in Cajon Creek is isolated and extremely vulnerable due to the many human intrusions in the watershed such as freeways, railroads, pipelines and other human disturbances.

Cleveland National Forest

We recommend continuation of the Class A designation for San Mateo Creek and its tributaries from its mouth upstream, San Juan Creek and its tributaries from its mouth upstream, and Santiago Creek and its tributaries within the Cleveland National Forest. Southern steelhead (*Oncorhynchus mykiss*) and its critical habitat are federally listed and are found within San Mateo Creek.

The following stream segments have known populations of Arroyo toad and are requested to be reclassified as Class A Streams. These areas are documented in the attached maps on the compact disc:

a. **Arroyo Seco Creek** - from Dripping Spring Campground, upstream to the boundary of Agua Tibia Wilderness. 1 mile. (San Diego/Riverside Counties, map 2).

b. **San Diego River**- between Ritchie Creek and Boulder Creek, above El Capitan Reservoir - known toad populations. Approximately 2 miles. (San Diego County, map 3.)

c. **Pine Creek and its tributaries including Noble Creek**- to a point one mile upstream of confluence with Pine Creek; Pine Creek from 2 miles upstream of confluence with Noble Creek to the Pine Creek Wilderness boundary, near Pine Valley. Approximately 8 miles. (San Diego County, map 4)

d. **Kitchen Creek** - From Cibbets Flat campground south for 2 miles. (San Diego County, map 4)

e. **Cottonwood Creek**- from Boulder Oaks (confluence of Cottonwood/Kitchen Creeks), 2 miles south to Buckman Springs. (San Diego County, map 4)

f. **Morena Creek**- and its tributaries between Kernan Road and Morena conservation camp. Approximately 2 miles. (San Diego County, map 4)

In addition, there are several Congressionally-designated Wildernesses within the Cleveland National Forest that are withdrawn from mineral entry and closed to mining, except for those mining claim with valid existing rights before the Wilderness was established. Arroyo toads and Western pond turtle (*Clemmys marmorata pallida*) are found within these areas, which are identified on the maps included on the compact disc. These include the **Agua Tibia Wilderness** (established 1975), **San Mateo Canyon Wilderness** (established 1984), **Pine Creek Wilderness** (established 1984), and **Hauser Wilderness** (established 1984). Lands that have been recommended for Wilderness designation include the **Cutca Valley** area, **Pine Creek**, and **Hauser Canyon**. These are also identified on the maps on the compact disc. All streams within Wilderness and recommended Wilderness should be classified as closed to dredging at all times.

Changed Circumstances and New Information Since 1994

Your public notice asks for new information, since 1994 when the DFG's regulations were last established, on the environmental impacts of suction dredging. There have been several major changes since the 1994 regulations were set. An important change has been the 1997 listing under the Endangered Species Act of the coho salmon requiring federal protection on the Klamath, Salmon and Trinity Rivers and having the Salmon River classified as "Designated Critical Habitat". The primary objective of the *Recovery Strategy for California Coho Salmon* (CDFG 2004) is to return coho salmon to a level of sustained viability, while protecting the genetic integrity of both ESU's, so that they can be delisted and regulations or other protections under the CESA will not be necessary. All watersheds that fall within the range of California coho salmon should be a priority for assessing potential impacts associated with suction dredge mining activity. Protection of the best remaining habitat, especially in areas where coho are still present, and improvements to degraded habitat are both necessary to the recovery of this species.

The other major change has been the die off of salmon in the lower Klamath River due to fatal summertime water temperatures. Limiting disturbance in cold water refugia is critical and should include protection at the mouths of tributaries and prohibition of suction dredging in designated major tributaries. The number and seasons of suction dredging operations must be examined in a particular reach of river.

Also limiting or in some case prohibiting the seasons for suction dredging activities on reaches of the Klamath and Trinity The actions will go a long way in protecting not only the federally listed coho salmon but also the Forest Service sensitive steelhead, lamprey, and green sturgeon.

In conclusion, thank you for this opportunity to provide information for your consideration. I also want to note the positive continued coordination between our agencies to provide for resource protection. Many policies and regulations have changed since 1994 that could affect suction dredging, such as the Best Management Practices (BMPs), forest plans, 303(d) listed waters, and new or revised TMDLs for several rivers and streams. Most of this information can be found within each individual National Forest website (www.fs.fed.us). For details or further information, please contact Hilton Cass, Regional Locatable Minerals Program Manager, at (707) 562-8967 or e-mail: hcass@fs.fed.us or Travis Coley, Regional Fish Program Manager, at (707) 562-8940 or e-mail: tcoley@fs.fed.us.

Literature Cited

California Department of Fish and Game. 2004. Recovery strategy for California coho salmon. Report to the California Department of Fish and Game Commission. California Dept. of Fish and Game. Sacramento, CA. 594pp.

Haglund, T.R. and J.N. Baskin. 2002. Status of the Santa Ana sucker and Santa Ana Speckled Dace in the U.S. Forest Service San Gabriel River OHV Area, West Fork of the San Gabriel River. Report to the U.S.D.A. Forest Service, Angeles National Forest, Arcadia California. 162 pp.

Hernandez, Juan. 1997. Memorandum to Dr. Dwayne Maxwell, Senior Fisheries Biologist. Region 5-IF. Fish survey on the East Fork of the Gabriel River and Cattle Creek, August 10, 1997. CDFG – Long Beach. 10 pp.

Sincerely,

RANDY MOORE
Regional Forester

Enclosures

cc: Forest Supervisors

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File Code: 2600/2810 **Date:** December 6, 2007
Route To:

Subject: California Fish and Game Suction Dredging Regulations

To: Regional Forester

The following are comments relating to California Department of Fish and Game (CDFG) Suction Dredging Regulations and impacts from resulting mining activities on the Plumas National Forest. Plumas National Forest comments are provided under the categories outlined by your office in the internal memo issued on November 16, 2007.

1) Whether suction dredge mining activities results in adverse impacts to the environment:

- The Plumas NF has documented incidences (see Attachment 1, Figures 2 and 3) where suction dredging has modified in-stream fisheries and amphibian habitat. Based on Regional Office letter dated May 26, 2004, suction dredging is defined as "the excavation of unconsolidated sands and gravels from the streambed with a motorized, hand held device." The movement of large boulders by a winch and chain (Figure 2) and the excavation of streambanks (Figure 3) do not appear to meet the intent of the suction dredging definition.

  The Plumas NF requests that the CDFG clarify in their suction dredging regulations the definition of what constitutes unconsolidated sands and gravels, and whether the movement of large boulders and the excavation of a streambank are compatible with existing or revised suction dredging regulations.

- Of the 1000 estimated mining claims we have on the Mt. Hough and Feather River Ranger Districts, only 3% of the operators submit a notice of intent to operate on Federal lands. Of those 3% that are monitored, the Forest has documented adverse impacts to the environment that include, but are not limited to: high banking, excessive sediment, modification of large in-stream habitat structures (boulders), occupation of federal lands longer than 30 days, and sanitation issues (human waste). The cumulative effects of the other 97% of dredgers operating on the Plumas NF are estimated to be at significant levels and causing adverse impacts to water quality, in-stream fish habitat, streambank stability, and aquatic species survival.

  As a result of the high number of operators that do not submit a notice of intent, the Plumas NF recommends the following courses of action:

  1. Increased cooperative enforcement efforts between CDFG field personnel and Forest Service minerals personnel to monitor a

greater number of the 97% of operators that do not submit Notices of Intent.

2. The CDFG modify their regulations to impose suspension or sanctions on mining operations and claims for up to 3 years for operators that do not file Notices of Intent with the Forest Service.

2) Whether suction dredge mining under CDFG's current regulations governing such activities results in deleterious effects to fish;

- Existing suction dredging operations do appear to have deleterious effects to fish. The suction dredging operation documented in Figure 2 is resulting in the downstream effects to fish and amphibians noted in Figure 1. This level of sediment results in deleterious effects to aquatic species in the form of inhibiting the hatching of eggs, development of fry, fingerlings and tadpoles, as well as the survival of adults. These sediment levels also adversely affect the food source (benthic invertebrates) of trout in our fish bearing streams.

  As a result of these deleterious effects to fish noted above, the Plumas NF recommends that the CDFG consider moving the beginning of dredging season on perennial fish bearing waters from the 4th Saturday in May to the 4th Saturday in June.

3) Whether there are changed circumstances or new information available since 1994 regarding suction dredge mining and the environment generally, and whether changed circumstances or new information available since 1994 indicates suction dredge mining under the CDFG's existing regulations is resulting in new significant or substantially more severe environmental impacts than previously considered by the CDFG.

- Since 1994, the Mountain Yellow-legged Frog (MYLF) has remained on our Regional Forester's Sensitive Species list, but it status has been heightened by the U.S. Fish & Wildlife Service (FWS). The FWS has concluded in its status review of listing proposals that the MYLF is warranted for listing, but precluded by higher priority listings. The FWS fully expects the MYLF to be listed under the Endangered Species Act in the near future (within the next 18 months). The Plumas NF is concerned about suction dredging within occupied MYLF streams, as the effects noted in items 1 and 2 above have been documented in occupied streams.

  1. As impacts continue within occupied MYLF streams, the Plumas NF recommends that the CDFG's suction dredging regulations require that operators to submit a Plan of Operations for any operation occurring within a Critical Aquatic Refuge and/or MYLF occupied stream.

  2. For suction dredging operations within occupied MYLF streams, the Plumas NF recommends that the CDFG's suction dredging regulations require a limited operating period (LOP) from May 1st (or beginning of the suction dredging season) to August 30th. This

LOP would significantly reduce adverse impacts to MYLF while still allowing suction dredging operations to continue during part of the year.

If you have any questions regarding the input provided above, please contact George Garcia, WFRP Program Manager at (530) 283-7828.

/s/Maria T. Garcia (for)
ALICE B. CARLTON
Forest Supervisor

cc: Patricia A Krueger
Hilton Cass

Attachment 1 - Impacts from Suction Dredging Operations on the Plumas NF

Figure 1. Sediment impacts from suction dredging on Hopkins Creek, Plumas NF. Sediment impacts fish reproduction (eggs) development (fry, fingerlings) and survival (adults) on this Trout stream. A food source such as the macroinvertebrate community is also impacted by this level of sediment.

Figure 2. Suction dredging operation on Hopkins Creek, Plumas NF. Note large boulder being moved by chain and winch resulting in modification of fish and amphibian habitat.

Figure 3. Suction Dredging Operation on the Little North Fork Middle Fork Feather River. Operator in this photo cut riparian vegetation (alder) from stream bank and dug out a hole in the stream bank behind large boulder for suction dredging access. Stream bank material excavated was moved into channel, modifying in-stream habitat and flows on this trout bearing stream.

CALIFORNIA TRIBAL
BUSINESS ALLIANCE

November 30, 2009

Mr. Mark Stopher
California Department of Fish and Game
Suction Dredge Program Comments
601 Locust Street
Redding, CA 96001

Dear Mr. Stopher:

I am writing on behalf of the eight member tribes of the California Tribal Business Alliance to submit our comments on the Initial Study for the Subsequent Environmental Impact Report on the Department's Suction Dredge Permitting Program.

The California Tribal Business Alliance was a sponsor of Senate Bill 670 in 2009, and we pushed the budget committees in the Legislature in 2008 to ensure that funding for the SEIR was retained in the state budget.

In particular, we are concerned about the SEIR discussion on Cultural Resources. Potentially significant impacts from suction dredge mining on cultural resources discussed in the initial study are entirely focused on historic objects such as shipwrecks historic structures and archaeological resources.

But mining activities and miners have had a profoundly negative impact on California Indians since the Gold Rush 160 years ago, and they continue to do so into the present time. There is no discussion in the SEIR of the impact of instream suction dredge mining on present-day cultural activities, including traditional ceremonies of Indian people and the use of traditional sites for gathering basketry materials and medicinal plants. Nor is there any discussion of the cultural impact of the loss of salmon runs, which are at the cultural center of some California Indian Tribes.

Indeed, given the history of mining in California, the very presence of miners in the heart of Indian Country is stressful to Indian people, particularly when the miners emulate the historic culture and beliefs of their predecessors. I have enclosed a sampling of comments about Indian people from the suction dredge miners' web pages by way of illustration.

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The schedule for the preparation of the SEIR and the adoption of regulations appears to be on a fast track in order to permit the resumption of dredge mining as quickly as possible. We are requesting that the Department put this process on a timeline that allows enough time for a respectful consultation with the Northwest California Indian Tribes and a careful consideration of the issues they raise.

On behalf of our eight member tribes – the Jackson Band of Miwuk Indians, the Lytton Band of Pomo Indians, the Pala Band of Mission Indians, the Paskenta Band of Nomlaki Indians, the Pauma Band of Luiseño Indians, the Picayune Rancheria of the Chukchansi Indians, the United Auburn Indian Community, and the Viejas Band of Kumeyaay Indians – I appreciate this opportunity to comment.

Sincerely,

Robert H. Smith, Chairman
California Tribal Business Alliance

Since we have brought attention to this issue on both a Federal and State level we have notified our members of both the indian and non-indian community not to approach miners due to the threat of violence. This notification was prompted by certain statements found on various "chat forums", and of shots being fired at tribal members along the Salmon River at a New 49er Claim back in 2004. It is also interesting to note some of the most vocal advocates (Jim Foley, Mike Higbee, Jerry Hobbs) actually are moderators on these forums and allow such nonsense. I've pasted some of them to allow you to get a "feel" of what we are facing here on the Klamath River.

http://www.golddredger.com/cgi-bin/dcforum/dcboard.cgi

- My letter to white chiefs asks them to stop anything that "may" or "may not" cause any harm at all....I want em more fish to gill net!!! I want Big SMOKEHOUSE full...me like um smoked fish. Me hope um gill nets full like many moons ago...me like to fill back of pinto wagon and sell em fish for $8 pound to pale faces...me afford um much firewater. Firewater good.

- "karuks" are not just a name of a band not tribe IMHO , but are people. http://karuk.us/staff/index.php these people are the ones filing these lawsuits. In reality the karuks were hideoutbands that lost many a sqaw to early miners .

- I am having a few pints and throwing a few darts (Below this is a picture of our Vice Chairman Leaf Hillman)

- I doubt anything short of a civil war will dislodge the parasitic organisms.

- No Russ, we need to do a lot more than that. We need to beat the crap out of liberal commie loving anti-American pansies. We need to start breaking legs. They don't fear lawsuits. They have lawyers to protect them and insurance companies to cover the losses. But they will stop when they start feeling the pain. You can have all the lawyers in the world and all the most expensive insuracnes available. It don't matter. Break a leg or two and they'll be fearful of us for a long time. I'd say leg breaking is a great start...hopefully the end is that they are exiled down to Mexico or Belize or some other place where they can do their best to try to screw it up in the name of "protection"...I kind of get the feeling the locals down there are going to be much less tolerant than we have been with this kind of sh*t. See how far legal manuvers take you South of the border ELF and company...I'm laughing just thinking about it. Drive them out and kick'em in the as* as they cross the Rio Grande and season them with a little rock salt.

- Time to break legs? Brother, it was time to do that decades ago!
  Carl

- If you can't appreciate the efforts being made by the groups above and the people that support them, then I suggest that you shut up and go out and get your group of leg breakers and bring them to california or what ever state that is having these problems and start breaking the appropriate legs. Put your words to work and show us how it is done.

  We need your help Happy New Year

  Jerry (Jerry Hobbs of People for Public Lands)

- The way I see it is, if they can use things out of context, then we can too. I'm sure we could render the karuk tribe as a bunch of horse theiving, murderous, money grubbin, savages. Then prove that they have no respect for the laws they are trying to get enforced on everyone else, so they can keep raping the fisheries, environment, and gamblers.

  Trevor

- Time to play cowboys and indians-John -now quote that Leaf ass wipe!!

  Hoser John

- I Agree John but this time lets finish the job. JingleBobs

- It would be more benaficial for the native fish, If America got rid of the Indians. Billions could be saved and spent on Americans rather than a conquered race of leaches. How's that Bruce?

  John Adams

http://www.49ermike.com/ Operated by Mike Higbee Medford, Oregon

- If Mike thinks there are "racist remarks" I am sure he will act accordingly.
  (Jim Foley)

- Those guys going behind our backs was just the only way that those scum of the earth Karuk's could win this. 150 years ago we the miners would have just killed them all for this

- I haven't played cowboys and indians since I was a kid.
  Hummm

- Indians with nets harm fish. It's time to stop the horse$hit we've let the Indians get away with for the last 1oo years.
  They're a citizen, I'm a citizen. NO SPECIAL LAWS OR FAVORS FOR ANY MINORITY!!!!!
  Our forefathers shed their blood to make this country free. Do we need to follow in their footsteps to keep it that way?

- well if past practice is what gives them "the indians" the right to over fish do dope kill animals with out a hunting licence. Why isn't it the whites right to get the gold and take the indians land away from them?HAHA Wyatt

- You guys have the mining laws backing you up and i dont see how a few... what are they? what did you call them?...dont matter. crack smoking, bourbon swilling, leftist, so-called indians who hire a greenpeace lawyer commie to give the land back to them through frivolous litigation a handful of crack head indians that nobody even heard of trying to end mining as we know it is just laughable. We sent ours to Oklahoma in the 1830's.

- This anti-American activity must stop if the indian tribes are to retain any of their honor and respect from other Americans.

Central Sierra Environmental Resource Center
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Visit our website at: www.cserc.org or contact us at: johnb@cserc.org

November 18, 2009

Mark Stopher
CA Department of Fish and Game
601 Locust Street
Redding, CA 96001
(530) 225-2275

Re: Suction Dredging regulatory assessment

Dear Mark:
Our staff apologizes for being unable to personally attend any of the three scoping meetings due to the long travel distance and time conflicts. We have no doubt that ardent suction dredging supporters will attempt to use the scoping meetings to emotionally lobby for relaxed regulations and a quick approval process. They will understandably speak from the heart with strong support for their hobby or part-time enterprise that in many cases is their primary recreational activity. Pro-dredging speakers will likely assure State Fish and Game representatives that the scoping process is biased because the NOP/Initial Study describe so many environmental impacts from suction dredging. And they will profusely complain that any new restrictions are unjustified and unnecessary.

Rather than be swayed by emotions, the DFG should base management of the State's water and wildlife resources on the best available science, on a priority placed on water quality, and on the recognition that pleasing a few thousand dredgers must be compared with pleasing countless thousands of recreational visitors, water users, fishermen, swimmers, and a host of others who will strongly oppose any re-opening of suction dredging use on State streams and rivers.

Our non-profit center's staff urges DFG to carefully and fully consider the following field-based comments and input. Our comments are based upon observations of extensive resource degradation from the use of suction dredges. In the following comments, we will respond to the various areas of scoping issues discussed in the Initial Study and give input towards the draft EIR.

Overall, the NOP and Initial Study are well written, clearly explained, and appropriately broad in assessing the environmental impacts associated with the direct use of suction dredging and indirect impacts that are tied to suction dredging. The documents appear to provide a legally adequate basis for developing an EIR that will analyze the potential impacts of suction dredging and develop an appropriate range of alternatives for management by the State.

BACKGROUND FOR THESE COMMENTS (from John Buckley)

As executive director for CSERC, for 13 years I was a U.S. Forest Service firefighter, forest patrolman, and public contact fire prevention technician. I spent three full years driving daily throughout a vast area of the Stanislaus National Forest, checking fire permits, educating the public about forest regulations, and working to prevent resource damage.

During that time period, I spent a considerable amount of time contacting campers/suction dredging enthusiasts on national forest lands downstream of a private mining camp where suction dredging was also heavily utilized in the search for gold. I discussed suction dredging with many users of the equipment. I observed the visible rewards a few dredgers reaped from their river operations. And I personally was repeatedly appalled by the extensive biological impacts that dredging caused for the North Fork Tuolumne River, the South Fork Stanislaus River and those rivers' natural resources (both aquatic and riparian).

After leaving the U.S. Forest Service, I helped establish a non-profit organization aimed at protecting water and wildlife resources across 2,000,000 acres of the central Sierra Nevada region. Accordingly, for the past 19 years I have not only personally visited local streams and

the past 19 years I have not only personally visited local streams and rivers hundreds and hundreds of times, but I have also watched suction dredging take place on numerous occasions.

The following comments from our CSERC staff are based upon not only past, close-up observations of suction dredging, but also upon conversations I have had with recreational visitors who often were highly offended by the noise, muddy water, and overall disturbance created by dredging.

Specific Scoping Comments

As the State DFG analyzes the environmental impacts of allowing suction dredging to take place in waters of the State, it is important not to be caught up in the incorrect assessment that the current halt to suction dredging in state waters has actually thwarted opportunities for mining and the search for gold by dredging enthusiasts. The current prohibition on the use of suction dredging does NOT fully or even significantly halt mining opportunities because it still allows the use of a suction dredge above the current waterline, because it allows the use of a suction dredge with its intake pipe removed (but still using a pump to move water through a sluice box,) and because it still allows power sluicing for gold.

Thus, to be accurate, any EIR analysis should identify that extensive mining activity is still possible despite the current prohibition against suction dredging below the current waterline or with the intake pipe removed or where miners utilize power sluicing for gold.

Furthermore, in terms of comparing the current period (with the highly publicized prohibition) with past levels of dredging use, **it is critically important for the EIR to acknowledge that enforcement of the prohibition is spotty, at best, and that many prohibitions will routinely be ignored since enforcement is not a top priority.**

Accordingly, in the EIR, it is essential for the document authors to capture the fact that legal methods of suction dredging operation may not be the only methods utilized -- especially in remote areas where

there are no close-at-hand enforcement personnel to monitor and to "catch" miscreants. As an example, in reality, despite the method limits described under 4.2.2 of the Initial Study concerning legal methods of operation, my personal observations of many users of suction dredging equipment is that they routinely suction dredge into the bank. In fact, it is my expectation that dredging into the bank is second only to dredging in the stream/river at the base of submerged boulders or in bars of gravel.

CSERC asks that the EIR fully acknowledge that due to the extremely low level of law enforcement capability of DFG or other associated authorities to monitor and enforce suction dredging regulations, many dredging users will float their pontoon-buoyed dredge into locations where visiblity from roads is limited or impossible. Thus, activities that are not in compliant with dredging regulations are extremely difficult to observe and penalize. Thus, **the EIR alternatives should consider fully the difficulty in enforcing dredging regulations and acknowledge that a reliance on self-enforcement is often the norm, rather than DFG personnel or other agency personnel being in a position to manage/control suction dredging usage.**

In my personal experience, I have observed many other non-compliance actions -- such as suction dredging enthusiasts digging into the riverbank above the stream and shoveling material into the river for suctioning. Unless an enforcement official is literally wading upstream along a river or stream, he or she may never be in a position to observe such violations due to screening of the dredging activities by willows, alders, or other riparian shrub or tree species.

<u>Additional issues of high concern that deserve intensive analysis and consideration in the draft EIR include</u>:

1) As DFG is fully aware, <u>macro-invertebrates are the base of the food chain for aquatic and even for many riparian species</u>. Thus, when macro-invertebrates are negatively affected by suction dredging, they suffer due to significantly degraded water quality, direct entrainment, pollution from petroleum leaks/spills, and the overall alteration of the stream habitat. In particular, it is the high level of sediment that is

stirred up or discharged into the stream that converts an often-clear water body into a brown or reddish brown sludge or milky river of mud.

Impacts to macro-invertebrates in the DEIR should be carefully and fully connected to how those impacts to macro-invertebrates then affect Special Status wildlife species and other aquatic or riparian species that are part of the food chain based on macro-invertebrates.

2) On one hand the DFG is attempting to develop a environmentally-acceptable fish stocking and hatchery program that will not pose significant risk to threatened and declining amphibian species. At the same time, DFG is considering management alternatives that would allow the use of suction dredges -- potentially in streams and rivers in suitable habitat that is valuable or essential for these same threatened and declining amphibian species.

Accordingly, in addition to considering the many obvious and less than obvious impacts that the use of suction dredges causes for at-risk amphibians species, it is essential under CEQA for the DFG to consider the cumulative impacts of suction dredges combined with fish stocking combined with climate change, combined chytridiomycosis, and combined with all the other clearly identified impacts that harm at-risk amphibian species.

While the DFG does not have the ability to manage or control climate change or livestock grazing impacts on amphibian habitat or the chytrid fungus, the DFG does have the capability to control fish stocking and suction dredging. Thus, any risk to Special Status or T&E wildlife species or warranted-but-precluded wildlife species must be considered to be significant in terms of the additive impacts combined with all of the cumulative impacts that DFG does not control.

Please recognize that the above argument will be a key one for groups such as our Center that are certainly ready to litigate against the State if a CEQA-compliant analysis is not the end product for suction dredging management.

In addition to the cumulative impacts to amphibians which suction dredging exacerbates, it is important for the draft EIR to acknowledge that amphibians, similar to macro-invertebrates, also suffer due to significantly degraded water quality, direct entrainment, pollution from petroleum leaks/spills, and the overall alteration of the stream habitat. The high level of sediment that is stirred up or discharged into the stream may significantly interfere with amphibians having successful feeding, breeding, or simply survival. In addition, there is almost always the potential for dredging to suction the egg masses and tadpoles of amphibians.

In the local region of the central Sierra Nevada, foothill yellow-legged frogs and other species may produce eggs masses in the shallow waters along rivers and streams where suction dredging occurs. With such incredibly low numbers of foothill yellow-legged frogs persisting in the local region, the relatively few population pockets of such frogs are especially vulnerable to extirpation if even a small percentage of their eggs are affected.

One of the key research findings of those studying the foothill yellow-legged frogs over recent years is that disturbance by fish or other predators tearing at the sides of egg masses not only consumes some eggs/tadpoles, but it often introduces fungal contamination that wipes out the remaining eggs. Thus, even where suction dredging does not suck in an entire egg mass, there is a potential for the entire egg mass to be lost if intrusion into the mass causes fungal spread through the remaining eggs.

The DEIR should carefully and fully assure that at-risk amphibian populations, both known and not yet discovered, are adequately protected from the negative impacts of suction dredging through appropriate regulatory limits, including a very narrow season of use, elimination of use in all stretches where known populations of at-risk amphibians exist, and in stretches with high suitability for either sustaining at-risk amphibian species or where the suitability can enable restoration or re-colonization to occur.

3) Similar to the effects of suction dredging upon macro-invertebrates and amphibians, <u>it is inarguable that suction dredging creates a significant negative impact overall in the State on a wide variety of fish species</u>. Similar to the problems created for the macro-invertebrates and amphibians, dredging obviously causes intensive alterations in water quality (converting clear to pristine water quality into temporarily mud-laden, silt laden, often contaminated water. The turbidity is frequently intensive, violating State Water Board standards for streams with relatively clear water prior to the dredging.

The DEIR should carefully assess how the State can assure (under any adopted management alternative for suction dredging) that all at-risk fish species (be it a Special Status species, a warranted-but-precluded species, a T&E species, or a Forest Service sensitive species) will be ensured of protection from any significant impact caused by suction dredging -- including temporary water quality turbidity that exceeds State standards, including suctioning of fry and eggs or juveniles, including the disturbance of young fish so that they become more vulnerable to predators, and including the disturbance of the stream/river bottom so that heavy metals are released into the water body and absorbed by the fish.

4) The current Initial Study does not fully describe how extensive impacts the negative impacts from suction dredging can be for downstream water users, including recreational users. **This issue should be expanded upon and underscored in the DEIR as a highly significant negative impact.**

It is my experience from working as a public contact "ranger" for the Forest Service that people who came to the river for a wide range of recreational activities were strongly and adversely opposed to staying in an area close to or downstream from active suction dredging.

The noise of the dredge pump is annoying and the antithesis of what many are traveling so far to attempt to experience -- especially on public lands along flowing rivers. Then the muddy water that moves downstream for hundreds of feet to a quarter mile or further is a direct turn-off to those wanting to swim, wade, fish, or play in the water. In

addition, the presence of dredgers' camps in close proximity to the water often discourages recreational day visitors from feeling comfortable entering an area where they may be accused of intruding into the camping "space" of dredgers.

The result of the above is that when frequent suction dredging takes place, especially in popular areas such as below Italian Bar bridge on public lands downstream of the private mining camp, recreational visitors quickly leave to go elsewhere and over time, most local recreational visitors simply stop coming to that stretch of river.

The noise caused by suction dredging creates such a conflict with quiet recreation that the impact should be considered a highly significant negative impact that cannot be mitigated.

5) **Domestic water supply streams and rivers should not have suction dredging allowed to take place on those waters due to a variety of contamination issues.** First, the direct effects of siltation and turbidity affect water quality for an extensive area. There is an inaccurate statement in the Initial Study on page 43 that states that the effects of dredging are localized in that they do not extend beyond the immediate area dredged. It is my personal conclusion from many observations of suction dredging that the heavily silted water can extend for at least as far as one-quarter mile downstream in low flow rivers such as the South Fork Stanislaus. In higher flow rivers, it may be true that dilution occurs more rapidly, but in many streams and lower flow rivers, the muddy water chokes the river for hundreds and hundreds of yards downstream.

Second, there is the issue of contamination by petroleum products caused by spilling gasoline while filling dredges floating on pontoons or other inflatable rafts while still in the stream. I have personally watched slightly inebriated dredgers fumble with the gas can and pour gas directly into the river by over-filling their dredge pump. Likewise, on at least one occasion, I saw a drizzle of oak dripping into the South Fork Stanislaus as a dredger used a dilapidated dredge set-up on its last legs. **The DEIR should fully acknowledge that while the overall amount of petroleum contamination may not be major, any violation of**

State water quality standards must be considered significant in streams or rivers that are domestic water supplies.

The Initial Study states on page 19 that most dredging takes place during the summer when flows are lower and water temperatures are higher. However, while the document may or may not be accurate in suggesting that water clarity may be the greatest during the popular summer season, there is no arguing with the fact that during periods of very low flows in streams or rivers, the sediment disturbance from dredging makes an even more significant rise in silt content in the water. That immediately degrades significantly the previously clear water quality. This is especially true if the State allows large nozzles and large pumps to be used. In the Initial Study, the document provides information on the amount of sediment moved by a dredge nozzle with a diameter up to 8." At such a large nozzle size, the amount of sediment moved by one suction dredge can be up to nearly 200 cubic yards per day.

All of these ways that suction dredges contaminate water supply streams and rivers should be fully and carefully analyzed in the DEIR. Likewise, any alternative for management should reasonably be designed so that no significant amount of sedimentation into streams and rivers is possibly allowed and that contamination by pumps-petroleum products is not tolerated and is not even potentially able to happen on streams and rivers that serve as domestic water supplies.

6) **It is important for the DEIR to carefully consider the associated impacts that allowing suction dredging will lead to in terms of encampments close to their work site**. Many dredgers do not stay at the privately owned encampments, but take their dredges onto public lands to dredge where they feel less mining disturbance has occurred than at already high graded sites. At both public and private sites, dredgers' encampments will frequently not have adequate sanitation due to being located too close to the stream or river, no bathroom facilities, and river canyon hillsides that are too steep to allow climbing up at least 100' from stream to go to the bathroom. Thus bodily wastes and trash often become an associated impact that may produce less

water contamination than the petroleum pollution or the sedimentation, but which cumulatively adds to water quality problems as well as to disturbance to aquatic wildife species.

7) As noted previously, noise is one of the major ripple effects from suction dredging. Similar to having an ATV whine loudly past non-motorized recreational visitors, having the suction dredge running is highly annoying to humans who are not part of the mining experience. Noise is especially a significant concern in steep river canyons where very low flows of water during the summer season mean minimal natural noise of river flow to help to cover over the sound of the whining pump. Instead, in such low flow river segment areas, the relatively silent seeping flow of the summertime river may provide little to zero river sound to mask the strong echoing noise of the suction dredge. **The significant negative impact of noise for the majority of recreational visitors is a problem that needs to be carefully addressed in all of the action alternatives in the DEIR.**

8) The scenic impacts to visual resources of suction dredging can be relatively minor in some situations to relatively significant in many other situations. **Any alternative brought forward for consideration of adoption by DFG should reasonably ensure that visual resources will not be significantly degraded.** During the summer season, the attraction of streams and rivers is often pivotal to a satisfying tourist or visitor experience in many rural areas. Muddy water that looks like sludge in a narrow, small river or stream can so dramatically appall visitors that they may believe that the local watershed is environmentally unhealthy and even potentially unsafe.

Thus, every alternative brought forward for management approval should carefully ensure that mitigation conditions are in place to require that no significant digging take place along the river's edge, that no suction dredging be allowed where extensive sediment will pollute stream or river segments important for tourism or important for scenic values.

9) As noted in passing in a previous comment, suction dredging disturbance of deposited mercury and other heavy metals often releases these long-held metals into the stream or river -- threatening aquatic species as well as recreational visitors/downstream users.

In stream or river segments where old mercury contaminants are still present, all alternatives should ban any suction dredging until such time that the State can assure that all heavy metals in the water body have been safely removed.

10) Based on the already extensive amount of information in the Initial Study, it is obvious that the use of suction dredging creates an impact of substantial significance. **CSERC's staff scientist and executive director both strongly agree with the mandatory findings of significance on page 96. We believe that under CEQA, the DFG thus has a legal obligation to adopt all feasible mitigation measures that may reasonably be expected to reduce the level of significance of the impact.**

It is essential that in this planning process, the DFG fully complies with CEQA, with state and federal wildlife protection requirements, with Clean Water Act and various state water regulations, and with a wide range of other environmental requirements.

DFG should develop a proposed action alternative that would do all of the following:

a) Ban any use of suction dredging in all streams and rivers in the state that are now designated as State or Congressionally listed Wild and Scenic segments;

b) Ban any use of suction dredging in all streams or river segments where dredging poses any risk to T&E wildlife or plant species, Special Status state-designated species, U.S. Forest Service sensitive species, warranted-but-precluded species, or other highly at-risk wildlife or plant species that would be affected by water quality degradation, active mining activities associated with the

suction dredging, or the wide range of other cumulative impacts that in total add up to affect biological resources.

c) Restrict the use of suction dredging to only those water bodies that are not a domestic water supply.

d) Restrict the use of suction dredging to only those stream reaches or river segments that do not have moderate to high potential to contain mercury deposits or other heavy metals that might be released into the water body by suction dredging.

e) Restrict the use of suction dredging to only water bodies where the use of such equipment and methods will not cause any significant impact to scenic/visual resource values.

f) And finally, in those water bodies that are not eliminated from suction dredging use based on the above criteria, that suction dredging is only allowed to be used where no more than minimal levels of regulatory violations occur. If numerous violations of dredging regulations occurs, the State should include in the proposed action alternative the management authority to close any river or stream segment from dredging use where persistent violations occur.

Thank you for considering these early scoping comments. Please ensure that our Center is made aware of the availability of the DEIR or new public meeting beyond the initial scoping workshops.

Respectfully,

John Buckley, executive director

Lindsey Myers, staff biologist

Friends of the North Fork
2810 Kadema Dr.
Sacramento, CA 95864

December 3, 2009

Mr. Mark Stopher
California Department of Fish and Game
Suction Dredge Program Comments
601 Locust Street
Redding, CA 96001

Dear Mr. Stopher:

I am writing on behalf of Friends of the North Fork to submit our comments on the Initial Study for the Subsequent Environmental Impact Report on the Department's Suction Dredge Permitting Program.

Program Objectives

On page 4, under Program Objectives, one program objective is to promulgate regulations as necessary that effectively implement Fish and Game Code section 5653 and 5653.9 and other applicable legal authorities. This SEIR is partially funded by the State Water Resources Control Board so that the Board can use its findings to determine whether the resulting DFG regulations satisfy the various water quality statutes enforced by the Board. This must be included in the program objectives, including information on how the program would comply with the Clean Water Act and other water quality and beneficial use laws under the Board's jurisdiction. This program objective should specifically cite the Board's compliance duties as an objective.

In addition, the Program Objectives should reflect the Department's obligation to comply with Fish and Game Code Section 1600 et seq, Streambed Alteration Agreements. As Friends of the North Fork noted in its June 21, 2007 letter to then-Department Director Ryan Brodderick, the Department's failure to require suction dredge permittees to comply with the state's Streambed Alteration Agreement statutes violates the courts' long-standing presumption against "implied repeals." The courts have regularly and consistently stated that all laws on a similar subject must be given full force and effect, unless it is impossible to rationally do so. The state's laws regarding suction dredging

and streambed alteration agreements are not so fundamentally incompatible that one must be pre-empted by the other.

We do not find in the initial study any consideration of the Department's enforcement capabilities in the analysis of whether there will be deleterious effects on fish from suction gold dredging activities. This activity has a high percentage of participants who reject compliance with regulations that might prevent harm to fish species. The Department has frequently indicated that it does not have sufficient enforcement personnel to assure compliance. Making matters worse, it is our understanding that the State Water Board, which has no personnel to enforce water quality standards, is contemplating delegating that responsibility to the Department. Program Objectives of this initial study must include the consideration of Department enforcement capabilities and provisions adequate to prevent deleterious effects on fish.

Applicability

On page 5, under Applicability, the initial study has a list of activities not considered suction dredging for purposes of the Proposed Program. These include "high banking" outside the water line and power sluicing. Both of these activities involve the use of engine-powered suction equipment to excavate the stream or river bed. As opposed to an operation in which the entire dredging operation is conducted instream, in high banking and power sluicing, the processing of the suctioned materials is outside the active waterway. However, the processed silt and sediments may not settle out before returning to the river; settling holes can be relatively large and remain after the activity is complete; and the operation can cause serious erosion of the stream bank and adjacent land surface. The initial study adopts these existing exclusions with no consideration of the instream impact of these activities and with no analysis of whether they are not suction dredging as defined by Section 5653. There is nothing in Fish and Game Code section 5653 that limits the definition of suction dredge equipment to only those operations that return the rejected material to the waterway.

On page 7 and 8, the initial study accepts a previously adopted definition of "deleterious effect" to mean (1) Catch, capture, kill, or injure a species listed as candidate, threatened or endangered under the state or federal Endangered Species Act; (2) A substantial reduction in the range of any species, and/or extirpation of a population; (3) A fundamental change to the structure of a community or stream ecosystem, including substantial reductions in biodiversity or resiliency to disturbance, resulting in the reasonably foreseeable consequence of (1) or (2) above."

"Deleterious" means harmful, a far lower standard than disastrous. The Fish and Game Code does not use any wording beyond "deleterious" to describe impact to fish species

sufficient to deny a dredge permit. "Catch, capture or kill," "extirpation," and "substantial reduction" are nowhere to be found in the statute's standard of harm to fish species. Nor does the statute say that only impacts to candidate, threatened or endangered species are to be considered. There is nothing in the statute nor in a common sense plain meaning of the word "deleterious" to support such a dire definition.

CEQA Issues

We are pleased that the Department has determined that the appropriate baseline for purposes of CEQA and the Subsequent EIR is the present situation of no dredging in California.

However, it has long been the position of Friends of the North Fork that the Department's failure to require environmental review of suction dredge permits on a project-by-project basis violates both the state's suction dredging statutes and CEQA.

As we noted in a June 21, 2007 letter to then-Director Ryan Brodderick,

> "...the suction dredge statute, itself, evinces the Legislature's intent that the Department should evaluate the project-specific effects of each suction dredging "operation" before issuing a permit: "If the department determines, pursuant to the regulations adopted pursuant to Section 5653.9, that the operation will not be deleterious to fish, it shall issue a permit to the applicant." The fact that the statute envisions project-specific site inspections and determinations to be made by the Department, at least for some of the suction dredge permits it issues, further indicates the Legislature's intent that the Department consider the impacts of suction dredging on a permit-by-permit basis.
>
> "The substantive law governing any particular agency approval determines whether sufficient agency "discretion" is being exercised to trigger CEQA's environmental review requirements. Thus, the Department's implied conclusion in its 1994 EIR that no further environmental review should be required for individual permits is not dispositive of the question of whether CEQA review is actually required by law. Rather, the question is: does the Department, under the suction dredge permitting statute, have the ability to refuse issuance of the permit due to its adverse environmental effects, or to impose conditions on the permit to reduce or avoid those effects?
>
> "In this case, the Department's apparent reliance on its 1994 EIR to issue suction dredging permits to any and all persons who submit the requisite fee is not consistent with CEQA's or section 5653's requirements. The Department

> clearly has the authority to refuse approval of a suction dredging permit to avoid its adverse environmental effects: section 5653, on its own terms, only authorizes the Department to issue a suction dredging permit upon a finding that the "operation" will not be deleterious to fish."

Friends of the North Fork still believes that if the Department fails to perform a site specific analysis in this new SEIR, then it needs to create a permit system that is site specific and that will condition the issuance of a permit on an analysis of the proposed location of a dredge mining operation. Otherwise, the Department will have no way to make the determination that a particular proposed dredging activity will not have a deleterious effect on fish.

Site specific analysis of the North Fork of the American River

Such a site specific EIR or site specific permit process would take into account the many different natural conditions on the many different California waterways. In the case of the North Fork of the American River, for instance, it would reflect:

1) The Department's own 1998 recommendations for the protections for the foothill yellow-legged frog:

> "The current season for this reach of the North Fork American River is from the last Saturday in May extending thru October 15. In some years the existing season may not be adequate to protect the breeding period (of the yellow-legged frog), e.g. below normal water years. Therefore a modification of the existing season is warranted to allow a majority of the tadpoles to reach sub-adult stage where they would be able to escape any suction dredge activity. This drainage has unique characteristics for both icthyofauna and herpetofauna, evidenced by strong populations of native minnows and amphibians. The development of more restrictive regulations that would protect these resources is warranted."

2) The Department's own conclusions about the possible presence of red-legged frogs in the North Fork Canyon, in which Department biologists noted that there is suitable habitat available and that "the extensive riparian vegetation and cover does not rule out the possibility of red-legged frogs being present in the canyon."

3) That UC Davis biologists now suspect that the trout present in the North Fork (which is not stocked by the Department) are remnant Central Valley steelhead that have adapted under difficult circumstances to the presence of downstream dams.

4) The presence of elemental mercury in the river bed left from historic upstream mining. We know from historical reports on hydraulic mining that some 200,000 pounds of mercury were "lost" into the North Fork American every year for about 10 years from the hydraulic mining activities at Gold Run alone. Mercury is still entrained in the river gravel and is transported downstream during storm events. It is present in pools of elemental mercury, and it is present in the sediments churned up by suction dredging activities. Any stream, the North Fork included, where such quantities of mercury are present must remain closed to suction dredge mining until the mercury has been safely removed.

We appreciate this opportunity to submit our comments on the Initial Study for the Subsequent Environmental Impact Report on the Department's Suction Dredge Permitting Program. We request the incorporation of the following documents already submitted by Friends of the North Fork to the Department and to the State Water Resources Control Board: our comments to the Department dated November 3, 2007 in response to the Department's request for information on the impacts of suction dredge mining; our comments to the SWRCB dated June 12, 2007 in connection with the Board's public hearing on suction dredge mining impacts on water quality; and our letter and legal memorandum to the Department dated June 21, 2007 concerning the Department's permitting of suction dredge mining.

Sincerely,

Alison Harvey

Alison Harvey
On Behalf of Friends of the North Fork

From: scott <scott@icmj.com>
To: <dfgsuctiondredge@dfg.ca.gov>
Date: 12/3/2009 12:27 PM
Subject: Suction Dredging Permitting Program
Attachments: Joseph-Greene-suction-gold-dredge-study.pdf; Joseph-Greene-suction-gold-dredge-study.doc; Claudia Wise on SB 670.pdf; Claudia Wise on SB 670.doc; The Economic Impact of Suction Dredging in California.pdf

**(Peer reviews by Joseph C. Greene and Claudia Wise are provided in both Microsoft Word and Adobe pdf format for your convenience. These documents may also be downloaded from our website at www.icmj.com or by clicking on the links at the bottom of this page.)
December 3, 2009
Mark Stopher
California Department of Fish and Game
601 Locust St
Redding, CA 96001

Mr. Stopher,

Thank you for the opportunity to provide comments on the initial scoping study for the suction dredge permitting program for California.

I have been the editor, publisher and owner of /ICMJ's Prospecting and Mining Journal/ for ten years. The magazine was originally established in 1931 as the /California Mining Journal/ and has been based in California since its inception. I also worked for the magazine prior to purchasing it, beginning in 1982. I began suction gold dredging in 1983, and have used suction gold dredges in both California and Oregon waterways. I believe my personal and professional experience provides valuable expertise in the area of suction gold dredging.

I have spent a considerable amount of time examining the initial study document and summary of available studies recently released for comments. Nowhere in those documents are the overriding laws listed or discussed, including the grants afforded miners by the mining laws from 1866 to present. While I'm sure you are aware that no regulations can be changed or implemented without considering the laws pertaining to mining, I am also aware that the various mining laws and grants are covered in comments submitted by Public Lands for the People and others, so I will not duplicate their efforts here.

The majority of the material cited in the Notice of Preparation was published prior to the original EIR in 1994 and subsequent attempt at a new EIR in 1997. The research material listed after that date is inadequate to support a change from insignificant to deleterious. In fact, I was unable to locate any definitive studies that make this conclusion; rather, the literature cited is ripe with speculation, often using words such as "may" cause or "could" cause harm to fish or their spawning areas.

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dredging as having de minimis effects or no significant effect on the environment they are used in. Nothing has changed in peer-reviewed literature since that time to change this fact."

Page 41 of the scoping literature states that mercury is discharged into our waterways by suction dredges. This is dishonest at best. Mercury is a heavy metal that settles at or near the bedrock due to its high specific gravity so it often gets vacuumed up and entrained in the dredge's riffles along with other heavy metals and minerals. One study cited in the scoping document claimed that approximately 98% of the mercury was recovered during a test. The study went on to claim that the remaining 2% could cause problems through fish contamination and methylation. Claudia Wise addresses this concern in her peer review:

/The mining community of today is, in my opinion, the only group that is in a position with the technology to help with the removal of lead and mercury at a very economical price to the public. Any residual mercury remaining after dredging is that much less to worry about residing in our Nations waterways.

In reviewing Humphrey's (2005) comments regarding possible problems associated with collecting mercury via suction dredging methods, it is right to look to the suction dredge community for help locating hotspots and removing mercury from the river systems. In my opinion the data provided in the report by Humphrey's (2005) did not demonstrate any clear conclusions that would prohibit the State from allowing this activity. On the contrary, in the discussion of results it was stated that a suction dredge in the American River was able to collect 98 percent of the measured mercury processed through the dredge. The amount of mercury collected may have been higher if the investigators had been using a dredge with the modern jet flare design. Even 98 percent is a huge plus for the environment and it would be irresponsible to not allow mercury to be removed from the rivers and streams whenever it is found.

In Humphreys report (2005), the author expressed concern for the loss of a small portion (2%) of the mercury from the back end of the sluice box. In the conclusions it was stated that the amount lost constituted a concentration more than ten times higher than that needed to classify it as hazardous waste. Yet 98 percent of the mercury was now secured and the process did not add any mercury to the system that was not already present. The small fraction lost, because of its density, would relocate back onto the river floor buried in the sediment close to where it was removed while dredging.

Mercury is continuously moved every winter in high storm events. Since the cessation of hydraulic mining, accumulated sediment from hydraulic placer mining has been transported to the Sacramento–San Joaquin Delta and San Francisco Bay by sustained remobilization (James, 1991). Providing a program to collect mercury from miners would aid the Water Board's mission of reducing mercury contamination in the deltas and bays where mercury methylation is a large concern.

In the test described by Humphreys (2005) a small portion of floured mercury was collected in the sediments as it escaped the sluice box. This mercury whether floured before it entered the sluice box, or not, would still be in elemental form. Regardless of surface area it would be no more toxic then the other 98 percent that was suggested to be left in place.

Aside from grossly polluted environments, mercury is normally a problem only where the rate of natural formation of methyl mercury from inorganic mercury is greater than the reverse reaction. Methyl mercury is the only form of mercury that accumulates appreciably in macroinvertebrates and fish. Environments that are known to favor the production of methyl mercury include certain types of wetlands, dilute low-pH lakes in the Northeast and North central United States, parts of the Florida Everglades, newly flooded reservoirs, and coastal wetlands, particularly along the Gulf of Mexico, Atlantic Ocean, and San Francisco Bay (USGS 2000).

If not collected the mercury is guaranteed to end up farther downstream, and eventually in the delta or the bay, where methylation is a real environmental problem. In my opinion it would be a highly irresponsible management practice to leave a large portion of mercury in the rivers and streams because of unrealistic concerns for the lesser amount moving only a short distance away from an operating dredge. Most likely if floured the movement of fine mercury would extend no farther than 50-feet off the end of the sluice box. That would relate to the distance a turbidity plume might extend downstream from a small-scale suction dredge.

However, if the mercury was left in place the next storm event would surely move it downstream closer to, and eventually into, the bay and delta. In fact, according to Humphrey's study in 2005 mercury was seen moving down stream and re-deposited on bedrock already dredge cleaned. The important fact here is mercury was flowing down stream in a suction dredge free zone during lower river flows than what take place under high winter river conditions.

It is most important to reduce the total amount of mercury in the streams and rivers and its transport downstream into the bays and deltas. This is defined as a part of Total Maximum Daily Load ("TMDL") goals.

We know for certain that mercury is transported downstream throughout the winter season during high water events. *Therefore, anytime there is the possibility for the removal of mercury by miners it should be undertaken and supported.* (Emphasis added.)/

Mr. Josiah H. Cornell III is retired from the USDA Forest Service in Oregon. Cornell addressed many of the issues related to spawning of salmon in his own study of suction gold dredging. Cornell stated:

/Salmonids spawned in the vicinity of the previous season's dredging, but, in one study, salmonids redds were not located in tailing piles. The gravels dispersed by the high stream flows, which included dredge tailings, certainly composed a portion of the suitable spawning gravels each year. Dredge tailings have been observed to provide good salmonid spawning ground due to the loose condition of the sand and gravel. In some places, mining debris may provide the best or only habitat.

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Mr. Greene, Ms. Wise and Mr. Cornell have extensive experience relevant to the upcoming EIR on suction gold dredging, including water quality, temperature, turbidity, fish, biota, and related topics. As we have recently learned from the release of emails indicating fraud involving the IPCC's climate change reports, some scientists have a desire to skew results whether it be motivated by continued monetary grants, personal or political agendas. Mr. Greene, Ms. Wise and Mr. Cornell are now retired from their respective government agencies. They are no longer dependant on grant money, nor are they required to adapt to an agency agenda to maintain employment. For these reasons, their opinions should carry a much stronger weight in this process.

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gold will be missed.

Table 1 states a miner utilizing a 4-inch dredge will move 1 to 5 cubic yards per hour. In my experience, I moved approximately 2 cubic yards of material *per day* with a 4-inch dredge averaging 6 hours with the dredge in operation, or 0.333 cubic yards per hour. Based on my personal and professional experience, I believe 0.333 cubic yards per hour is a realistic amount for any miner using a 4-inch dredge. Each miner is looking to recover as much gold as possible, not to just move material. While a dredge can surely move more material, the miner's goal is to clean out the cracks and crevices to recover the gold, which is a time-consuming process. Much of the miner's time is spent cleaning out those cracks and crevices, hence the lower volume of material processed.

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December 3, 2009

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ATTACHMENT A

State Water Resources Control Board
Division of Water Quality
P.O. Box 100
Sacramento, California 95812-0100
Fax: 916-341-5620
email: commentletters@waterboards.ca.gov

June 6, 2007

Subject: **SUCTION DREDGE MINING**

Dear Board Members,

Thank you for allowing me this opportunity to comment on the water quality aspects of small-scale suction dredge mining.

As I have searched the scientific literature for studies on the effects of small-scale suction dredge mining on the environment I have learned that the preponderance of the published research studies have been directed towards assessment of its effect on the biology of the streams and rivers. In nearly every instance the results have concluded that the effects were less than significant.

In water quality terms some studies have discussed turbidity, water temperature, and suspension of heavy metals into the overlying water. I will focus my water quality comments on these three areas. But first I would like to put this issue in to perspective.

GEOGRAPHICAL SCALE OF SMALL-SCALE SUCTION DREDGING

It has been observed that environmentalists opposing suction dredging use data gleaned from reports that studied effects of environmental perturbations that are occurring on a system-wide basis. For example, they would characterize the affects of turbidity from a suction dredge as if it would impact downstream organisms in a manner that system-wide high water flow events might. This approach is entirely inconsistent with the way in which suction dredges operate or generally impact their downstream environment.

The California Department of Fish and Game (1997) described typical dredging activities as follows' "An individual suction dredge operation **affects a relatively small portion of a stream or river**. A recreational suction dredger (representing 90-percent of all dredgers) may spend a total of four to eight hours per day in the water dredging an area of 1 to 10 square meters. The average number of hours is 5.6 hours per day. The remaining time is spent working on equipment and processing dredged material. The area or length of river or streambed worked by a single suction dredger, as compared to total river length, is relatively small compared to the total available area."

In the Oregon Siskiyou National Forest Dredge Study, Chapter 4, Environmental Consequences, some perspective is given to small-scale mining. "The average claim size is 20 acres. The total acreage of all analyzed claims related to the total acres of watershed is about ***0.2 percent***. The average stream width reflected in the analysis is about 20 feet or

less and the average mining claim is 1320 feet in length. The percentage of land area within riparian zones on the Siskiyou National Forest occupied by mining claims is estimated to be only ***0.1 percent***." The report goes on to say, "Over the past 10 years, approximately 200 suction dredge operators per season operate on the Siskiyou National Forest" (SNF, 2001).

A report from the U.S. Forest Service, Siskiyou National Forest (Cooley, 1995) answered the frequently asked question, "How much material is moved by annual mining suction dredge activities and how much does this figure compare with the natural movement of such materials by surface erosion and mass movement?" The answer was that suction dredges moved a total of 2,413 cubic yards for the season. Cooley (1995) used the most conservative values and estimated that the Siskiyou National Forest would move 331,000 cubic yards of material each year from natural causes. Compared to the 2413 (in-stream) cubic yards re-located by suction mining operations the **movement rate by suction dredge mining would equal *about 0.7% of natural rates.***

It has been suggested that a single operating suction dredge may not pose a problem but the operation of multiple dredges would produce a cumulative effect that could cause harm to aquatic organisms. However, "No additive effects were detected on the Yuba River from 40 active dredges on a 6.8 mile (11 km) stretch. The area most impacted was from the dredge to about 98 feet (30 meters) downstream, for most turbidity and settleable solids (Harvey, B.C., K. McCleneghan, J.D. Linn, and C.L. Langley, 1982). In another study, "Six small dredges (<6 inch dredge nozzle) on a 1.2 mile (2 km) stretch had no additive effect (Harvey, B.C., 1986). *Water quality was typically temporally and spatially restricted to the time and immediate vicinity of the dredge* (North, P.A., 1993).

A report on the water quality cumulative effects of placer mining on the Chugach National Forest, Alaska found that, "The results from water quality sampling do not indicate any strong cumulative effects from multiple placer mining operations within the sampled drainages." "Several suction dredges probably operated simultaneously on the same drainage, but did not affect water quality as evidenced by above and below water sample results. *In the recreational mining area of Resurrection Creek, five and six dredges would be operating and not produce any water quality changes* (Huber and Blanchet, 1992).

The California Department of Fish and Game stated in its Draft Environmental Impact Report that "Department regulations do not currently limit dredger densities but the activity itself is somewhat self-regulating. Suction dredge operators must space themselves apart from each other to avoid working in the turbidity plume of the next operator working upstream. *Suction Dredging requires relatively clear water to successfully harvest gold* " (CDFG, 1997).

ELEVATED TURBIDITY AND SUSPENDED

Suction dredging causes less than significant effects to water quality. The impacts include increased turbidity levels caused by re-suspended streambed sediment and pollution caused by spilling of gas and oil used to operate suction dredges (CDFG, 1997).

"Suction dredges, powered by internal combustion engines of various sizes, operate while floating on the surface of streams and rivers. As such, oil and gas may leak or spill onto the water's surface. ***There have not been any observed or reported cases of harm to plant or wildlife as a result of oil or gas spills associated with suction dredging***" (CDFG, 1997).

The impact of turbidities on water quality caused by suction dredging can vary considerably depending on many factors. Factors which appear to influence the degree and impact of turbidity include the amount and type of fines (fine sediment) in the substrate, the size and number of suction dredges relative to stream flow and reach of stream, and background turbidities (CDFG, 1997).

Because of low ambient levels of turbidity on Butte Creek and the North Fork American River, California, Harvey (1986) easily observed increases of 4 to 5 NTU from suction dredging. Turbidity plumes created by suction dredging in Big East Fork Creek were visible in Canyon Creek 403 feet (123 meters) downstream from the dredges (Somer and Hassler, 1992).

In contrast, Thomas (1985), using a dredge with a 2.5-inch diameter nozzle on Gold Creek, Montana, found that suspended sediment levels returned to ambient levels 100 feet below the dredge. Gold Creek is a relatively undisturbed third order stream with flows of 14 cubic feet per second. A turbidity tail from a 5-inch (12.7 cm) dredge on Clear Creek, California was observable for only 200 feet downstream. Water velocity at the site was about 1 foot per second (Lewis, 1962).

Turbidity below a 2.5 inch suction dredge in two Idaho streams was nearly undetectable even though fine sediment, less than 0.5 mm in diameter, made up 13 to 18 percent, by weight, of substrate in the two streams (Griffith and Andrews, 1981).

"During a dredging test carried out by the California Department of Fish and Game on the north fork of American River, it was concluded that turbidity was greatest immediately downstream, returning to ambient levels within 100 feet. Referring to 52 dredges studied, Harvey (1982) stated "...generally rapid recovery to control levels in both turbidity and settable solids occurred below dredging activity."

Hassler (1986) noted "...during dredging, suspended sediment and turbidity were high immediately below the dredge, but diminished rapidly within distance downstream." He measured 20.5 NTU 4 meters below a 5-inch dredge that dropped off to 3.4 NTU 49 meters below the dredge. Turbidity from a 4-inch dredge dropped from 5.6 NTU 4 meters below to 2.9 NTU 49 meters below with 0.9 NTU above. He further noted "...water

quality was impacted only during the actual operation of the dredge...since a full day of mining by most Canyon Creek operators included only 2 to 4 hours of dredge running time, water quality was impacted for a short time." Also "...the water quality of Canyon Creek was very good and only affected by suction dredging near the dredge when it was operated."

The US Geological Survey and the Alaska Department of Natural Resources conducted a survey into dredging on Alaska's Fortymile River, which is a river designated as a wild and scenic corridor. The study stated, "One dredge had a 10-inch diameter intake hose and was working relatively fine sediment on a smooth but fast section of the river. The other dredge had an 8-inch intake and was working coarser sediments in a shallower reach of the river. State regulations require that suction dredges may not increase the turbidity of the river by more than 5 nephelometric turbidity units (NTU), 500 feet (=150m) downstream. In both cases, the dredges were well within compliance with this regulation."

Figure 2. Results of turbidity survey behind an operating 10-inch suction dredge (site #1 on fig. 1). All numbers shown are in NTU, or nephelometric turbidity units; the standard unit of turbidity. The right bank of the river is off the edge of the figure. The approximate shape of the plume is shown in gray. Note that the figure is exaggerated 5x horizontally, so the plume is actually much narrower than it appears in the figure. To comply with State regulations, dredges may not increase the turbidity of the river by more than 5 NTU, 500 feet behind the dredge.

http://www.akmining.com/mine/usgs1.htm

Samples were collected on a grid extending downstream from the dredges as they were operating and compared to measurements made upstream of the dredges. One dredge had a 10-inch diameter intake hose and was working relatively fine sediments on a smooth but fast section of the river. The results of the turbidity survey for the 10-inch dredge are shown on figure 2. Turbidity values behind the 8-inch dredge were lower, because the smaller intake was moving less sediment material, and because the coarser sediments being worked by the 8-inch dredge settled more rapidly

The turbidity values found in the dredge studies fall within the range of turbidity values found for currently mined areas of the Fortymile River and many of its un-mined tributaries. Figure 3 shows the ranges of turbidity values observed along the horizontal axis, and the number of samples that fall within each of those ranges. For example, 25 samples had turbidity between 1.0 and 1.5 NTU, 22 of which were in a dredged area. The

highest turbidity value was from an un-mined tributary to Uhler Creek; the lowest from a number of different tributaries to the North Fork. As seen on the figure, there is no appreciable difference in the distribution of turbidity values between mined and un-mined areas.

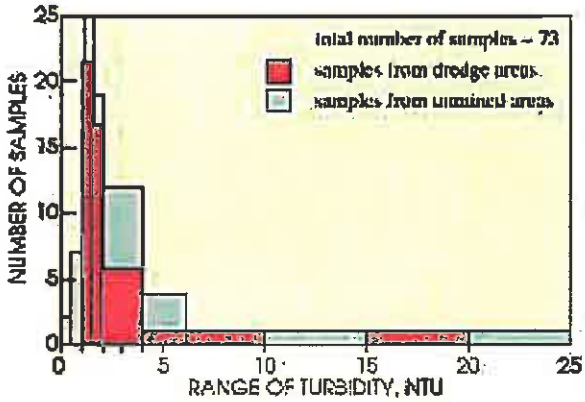

Figure 3. A comparison of turbidity values between mined and unmined areas shows that the suction dredge mining does not affect the turbidity of the Fortymile River system under the conditions studied. The highest turbidity values from the dredge areas are within 200 feet (60 m) of the back of the two operating dredges which were studied.

http://www.akmining.com/mine/usgs1.htm

In American studies, average turbidity levels have been shown to be between 5 and 15 NTU 5 meters below dredges. But even the maximum turbidity level measured in a clay pocket (51 NTU) fell below 10 NTU within 45 meters. Turbidity increases, from even large dredges on moderate sized streams, have shown to be fairly low, usually 25 NTU or less, and to return to background within 30 meters. The impact is localized and short lived; indicating minimum impact on moderate and larger waterways.

Within any waterway, sediment is primarily carried in suspension during periods of rainfall and high flow. This is an important point, as it indicates that a dredging operation has less, or at least no greater effect on sediment mobilization and mobility than a rain storm."

All of these research studies have concluded that only a local significant effect occurs, with it decreasing rapidly downstream. The studies have been wide spread, having been undertaken in Alaska, Idaho, California, Montana and Oregon.

The science supports *de minimus* status for $\leq$ 6-inch suction dredges. Turbidity is *de minimus* according to the U.S. Army Corps of Engineers.

"Effects from elevated levels of turbidity and suspended sediment normally associated with ***suction dredging as regulated in the past in California appear to be less than significant with regard to impacts to fish and other river resources*** because of the level of turbidity created and the short distance downstream of a suction dredge where turbidity levels return to normal" (CDFG, 1997).

Furthermore, individuals that have not, in fact, operated suction dredges may not realize that it is a self-limiting operation. The dredge operator must be able to see his work area to operate safely and manage the intake of the dredge nozzle. ***If high levels of turbidity***

were to flood the dredger's work area and render him "blind" he would have to move the operation to another location.

INCREASING WATER TEMPERATURE

Responsible suction dredge miners do not dredge stream banks (it is illegal). Dredging occurs only in the wetted perimeter of the stream. Therefore, it is unlikely suction dredging will cause a loss of cover adjacent to the stream.

Solar radiation is the single most important energy source for the heating of streams during daytime conditions. The loss or removal of riparian vegetation can increase solar radiation input to a stream increasing stream temperature. ***Suction dredge operations are confined to the existing stream channel and do not affect riparian vegetation or stream shade*** *(SNF, 2001).*

Suction dredging could alter pool dimensions through excavation, deposition of tailings, or by triggering adjustments in channel morphology. Excavating pools could substantially increase their depth and increase cool groundwater inflow. This could reduce pool temperature. If pools were excavated to a depth greater than three feet, salmonid pool habitat could be improved. In addition, ***if excavated pools reduce pool temperatures, they could provide important coldwater habitats for salmonids living in streams with elevated temperatures*** *(SNF, 2001).*

Dredge mining had little, if any, impact on water temperature (Hassler, T.J., W.L. Somer and G.R. Stern, 1986). In addition, the Oregon Siskiyou Dredge Study states, "***There is no evidence that suction dredging affects stream temperature***" *(SNF, 2001).*

Increases in sediment loading to a stream can result in the stream aggrading causing the width of the stream to increase. This width increase can increase the surface area of the water resulting in higher solar radiation absorption and increased stream temperatures. ***Suction dredge operations are again confined to the existing stream channel and do not affect stream width*** *(SNF, 2001).*

Stream temperature can also increase from increasing the stream's width to depth ratio. The suction dredge operation creates piles in the stream channel as the miner digs down into the streambed. The stream flow may split and flow around the pile decreasing or increasing the wetted surface for a few feet. However, within the stream reach that the miner is working in, the change is so minor that the overall wetted surface area can be assumed to be the same so the total solar radiation absorption remains unchanged. ***Suction Dredging results in no measurable increase in stream temperature*** *(SNF, 2001).*

"Small streams with low flows may be significantly affected by suction dredging, particularly when dredged by larger dredges (Larger than 6 inches) (Stern, 1988). However, the California Department of Fish and Game concluded, "current regulations *restrict the maximum nozzle size to 6 inches on most rivers and streams which, in*

conjunction with riparian habitat protective measures, results in ***a less than significant impact to channel morphology***" (CDFG, 1997).

WATER CHEMISTRY

Concern has been raised that small-scale dredge operations may increase the metal load of the surface waters. Whereas dredge operations do re-suspend the bottom sediment, the magnitude of this disturbance on stream metal loading was unknown. It was unknown what affect the dredge operations may have on the transport and redistribution of metals—some of which (for example, arsenic, copper, and zinc) have environmental importance.

The U.S. Geological Survey and the Alaska Department of Natural Resources cooperated in a project, on Fortymile River, to provide scientific data to address these questions. This river is designated a Wild and Scenic Corridor by the Alaska National Interest Lands Conservation Act. Current users of the river include placer mine operators, as well as boaters and rafters. Along the North Fork Fortymile River, and just below its confluence with the South Fork, mining is limited to a few small suction dredges which, combined, produce as much as a few hundred ounces of gold per year. In this area, some potential environmental concerns have been raised associated with the mining activities, including increased turbidity of the river water; adverse impact on the overall chemical quality of the river water; and potential additions of specific toxic elements, such as arsenic, to the river during mining operations.

Field measurements were made for pH, turbidity, electrical conductivity (a measure of the total dissolved concentrations of mineral salts), and stream discharge for the Fortymile River and many of its tributaries. Samples were collected at the same time for chemical analyses, including trace-metal analyses

Water-quality samples were collected at three points 200 feet behind each of the two operating suction dredges. One sample was collected on either side of the plume, and one in the center of the plume. The samples were passed through a filter with a nominal pore size of 0.45 micrometers and acidified to a pH less than about 2. Results are shown in the following table. Samples 1A, 1C, 2A, and 2C are from either side of the plume behind dredges 1 and 2, respectively. Samples 1B and 2B are from the center of each plume. All concentrations given are in micrograms per liter, except pH, which is expressed in standard units.

The data show similar water-quality values for samples collected within and on either side of the dredge plumes. Further, the values shown in the table are roughly equal to or lower than the regional average concentrations for each dissolved metal, based on the analyses of 25 samples collected throughout the area. Therefore, ***suction dredging appears to have no measurable effect on the chemistry of the Fortymile River*** within this study area. We have observed greater variations in the natural stream chemistry in the region than in the dredge areas (Wanty, R.B., B. Wang, and J. Vohden. 1997).

		Side 1	Dredge 1	Side 2		Side 1	Dredge 2	Side 2
		1A	**1B**	**1C**		**2A**	**2B**	**2C**
pH		7.7	7.6	7.8		7.0	7.5	7.5
Arsenic		0.3	0.3	0.3		0.3	0.3	0.3
Iron		110.	110.	110.		100	97	100
Chromium		2	2	3		3	3	3
Cadmium	all less than 0.02 micrograms per liter							
Cobalt		0.07	0.07	0.06		0.06	0.05	0.05
Zinc		0.8	0.6	0.8		1.0	1.0	1.0
Lead	all less than 0.05 micrograms per liter							

A final report from an EPA contract for analysis of the effects on mining in the Fortymile River, Alaska stated, "This report describes the results of our research during 1997 and 1998 into the effects of commercial suction dredging on the water quality, habitat, and biota of the Fortymile River.... The focus of our work on the Fortymile in 1997 was on an 8-inch suction dredge (Site 1), located on the mainstem... At Site 1, dredge operation had no discernable effect on alkalinity, hardness, or specific conductance of water in the Fortymile. Of the factors we measured, the primary effects of suction dredging on water chemistry of the Fortymile River were increased turbidity, total filterable solids, and copper and zinc concentrations downstream of the dredge. These variables returned to upstream levels within 80-160 m downstream of the dredge. The results from this sampling revealed a relatively intense, but localized, decline in water clarity during the time the dredge was operating" (Prussian, A.M., T.V. Royer and G.W. Minshall, 1999).

"The data collected for this study help establish regional background geochemical values for the waters in the Fortymile River system. As seen in the chemical and turbidity data **any variations in water quality due to the suction dredging activity fall within the natural variations in water quality**" (Prussian, A.M., T.V. Royer and G.W. Minshall, 1999).

REMOVAL OF MERCURY FROM THE ENVIRONMENT

Looking for gold in California streams and rivers is a recreational activity for thousands of state residents. As these miners remove sediments, sands, and gravel from streams and former mine sites to separate out the gold, they are also removing mercury. This mercury

is the remnant of millions of pounds of pure mercury that was added to sluice boxes used by historic mining operations between 1850 and 1890. Modern day small-scale gold suction dredgers do not use mercury to recover gold during the operation of the dredge. Therefore, any gold that would be found in their possession would be that which was extracted from the stream or river they are working.

Taking mercury out of streams benefits the environment. Efforts to collect mercury from recreational gold miners in the past, however, have been stymied due to perceived regulatory barriers. Disposal of mercury is normally subject to all regulations applicable to hazardous waste.

In 2000, EPA and California's Division of Toxic Substance Control worked in concert with other State and local agencies to find the regulatory flexibility needed to collect mercury in a simple and effective manner. In August and September, 2000 the first mercury "milk runs" collected 230 pounds of mercury. A Nevada County household waste collection event held in September 2000 collected about 10 pounds of mercury. The total amount of mercury collected was equivalent to the mercury load in 47 years worth of wastewater discharge from the city of Sacramento's sewage treatment plant or the mercury in a million mercury thermometers. This successful pilot program demonstrates how recreational gold miners and government agencies can work together to protect the environment (US EPA, 2001).

Mercury occurs in several different geochemical forms, including elemental mercury, ionic (or oxidized) mercury, and a suite of organic forms, the most important of which is methylmercury. Methylmercury is the form most readily incorporated into biological tissues and is most toxic to humans. The process of mercury removal by suction dredging does not contaminate the environment because small-scale suction dredging removes elemental mercury. Removal of elemental mercury before it can be converted, by bacteria, to methylmercury is a very important component of environmental and human health protection provided as a secondary benefit of suction dredging..

THE REAL ISSUE

The issue of localized conflict with suction dredgers and other outdoor recreational activities can be put into a more reasonable perspective using the data provided at the beginning of this report. For example, the total acreage of all analyzed claims related to the total acres of watershed is about *0.2 percent.* The percentage of land area within riparian zones on the Siskiyou National Forest occupied by mining claims is estimated to be only *0.1 percent.*" The report goes on to say, "Over the past 10 years, approximately 200 suction dredge operators per season operate on the Siskiyou National Forest (SNF, 2001).

The issue against suction dredge operations in the streams of the United States appears to be less an issue of environmental protection and more of an issue of certain organized individuals and groups being unwilling to share the outdoors with others without like interests.

Management of the Fortymile River region (a beautiful, wild and scenic river in the remote part of east-central Alaska) and its resources is complex due to the many diverse land-use options. Small-scale, family-owned gold mining has been active on the Fortymile since the "gold rush" days of the late 1880's. However, in 1980, the Fortymile River and many of its tributaries received Wild and Scenic River status. Because of this status, mining along the river must compete with recreational usage such as rafting, canoeing, and fishing.

A press release from the U. S. Geological Survey stated, in part, the following, "The water quality of the Fortymile River-a beautiful, ...has not been adversely impacted by gold placer mining operations according to an integrated study underway by the U.S. Geological Survey and the Alaska Department of Natural Resources.

Violation of mining discharge regulations would close down the small-scale mining operations. No data existed before this study to establish if the mining was degrading the water quality. **However, even with the absence of data, environmental groups were active to close down mining on the river citing unsubstantiated possible discharge violations.**

This study has found no violations to date to substantiate closure of the small-scale mining operations. The result is a continuance of a way of life on the last American frontier." (U.S. Geological Survey October 27, 1998). I have no doubt that this is the real issue currently facing small-scale gold suction dredgers in California.

Suction dredges do not add pollution to the aquatic environment. They merely re - suspend and re-locate the bottom materials (overburden) within the river or stream.

I hope this scientific research information I have provided will be helpful in your efforts regarding suction dredge mining and water quality. I thank you for this opportunity to submit this data.

Respectfully Yours,

Joseph C. Greene
Research Biologist, U.S. EPA **Retired**

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ATTACHMENT B

The Honorable Governor Arnold Schwarzenegger
State Capitol Building
Sacramento, CA 95814
Fax: 916-558-3160

Dear Governor Schwarzenegger,

PLEASE VETO BILL SB670 (anti-suction dredging legislation)

My name is Claudia Wise; I retired in 2006 after 32 years of civil service with the U.S.EPA as a physical scientist/chemist. I have been a member of many scientific projects over the years starting my federal career in the Fish Toxicology arena and ending it with the Salmon Restoration division. I have worked on projects ranging from urban fish populations and fish avoidance testing to eelgrass habitat and global climate change. I have been and remain to be a strong proponent of protecting the environment.

On October 11, 2007 in regards to AB 1032 I wrote to you regarding another attempt by the legislature to get around a court order and unnecessarily put a large group of miners and businesses out of work with no scientific evidence to support their claims.

Dozens of peer-reviewed journal articles some commissioned by the USEPA, USGS, CDFG, Corp of Engineers, and many more from universities support suction dredging as having *de minimis* effects or no significant effect on the environment they are used in. Nothing has changed in peer-reviewed literature since that time to change this fact.

Suction dredge mining has little impact on the areas fish and biota. In relation to natural occurrences suction dredge mining is insignificant. To put the impact of suction dredge mining into perspective it was calculated that suction dredge mining disturbs only 0.7% of the sediment that is moved naturally in a year. The Siskiyou National Forest (SNF), where this study occurred, is a very prominent mining area in California.

According to the U. S. Forest Service, SNF, "There are 1,092,302 acres on the Siskiyou Natural Forest. Using a factor of 0.33 cubic yards per acre per year times 1,092,302 acres will produce a very conservative estimate that 331,000 cubic yards of material move each year from natural causes compared to the 2413 cubic yards that was moved by suction dredge mining operations in 1995. This would be a movement rate by suction dredge mining that equals about 0.7% of natural rates." (Cooley 1995).

California Department of Fish and Game already regulates the miners out of the waterways during important life events for the Salmon. That includes during spawning season when redds are present.

It is well known that suction dredging causes little or no environmental harm to fish and biota what many overlook are the many benefits that dredging provides such as increased spawning gravels, dredge made refugia, and yes, mercury remediation to name a few.

Suction dredging breaks up cemented riverbeds providing fish with loose gravel for future spawning grounds in areas fish presently are not able to use for spawning. Between 1996 and 1998, Quihillalt (1999) found 4% of redds where located on or within 1000 m of dredge tailings. He theorized that dredge tailings may be attractive sites for redd construction because tailings are often located near riffle crests where fish frequently spawn, and they provide loose, appropriately sized substrate. However, embryos in tailings may suffer high mortality during years of high river flows (1998) and be of no concern during years of low river flows (1996 & 1997).

During a later survey on the Klamath River during 2002 only one redd was observed on suction dredge tailings. Recreational suction dredge mining was present throughout the survey from the Highway I-5 Bridge to Happy Camp (Schuyler and Magneson. 2006).

Even with scouring effects to redds reported in scientific literature this gravel provides areas to spawn that would not otherwise be available to them. Any added benefit to increasing salmon productivity, using suction dredging, is a benefit to fish numbers. Even during years of high mortality due to high flow events if only a few of the embryos survive that may be more than would be expected without the benefit of added spawning gravels provide by the tailings.

I have been involved in temperature surveys on the Klamath River in California in regards to suction dredge activity and existing conditions of refugia. We have found natural refugia to be no better in many cases to that of dredge made refugia.

Dredge holes can provide a holding place for fish as they pass up the waterway on their migration path to and from the ocean providing a place to get out of the faster currents to rest. Some of these dredge holes may also be cooler due to ground water seepage if the holes are deep enough. This leads to development of additional areas of needed refugia.

Another Benefit the suction dredge community could provide the state with is mercury remediation. In talking with miners, the majority typically do not run into large pools or hot spots of mercury. However, their concerned for the environment is the same as other citizens. Miners have shown the willingness to hand over collected mercury to a collection facility if such a facility exists. The California State Water Board's Water Quality Division report (Humphreys, 2005) suggested the idea of paying the miner's for their efforts would help facilitate this plan. Collection facilities have been provided in the past with great response.

The California Water Board has spent a lot of time and money on mercury remediation projects with limited success, though in 2001 EPA Region 9 located in San Francisco, California did collect mercury from miners very effectively. Collections of mercury has been happening in Oregon and Washington through the states respective Division's of Ecology and with even greater success at miner's rallies.

Even though EPA Region 9 has ended this program and removed it's existence from the website EPA, Region 9 had a mercury "milk run" in 2000. Agency personnel were able to collect 230 pounds of mercury from miners and local dentists. The total amount of mercury collected was equivalent to the mercury load in 47 years worth of wastewater discharge from the city of Sacramento's sewage treatment plant or the mercury in a million mercury thermometers. (US EPA, 2001.)

Over the past four years, the Resources Coalition and other small-scale miners associations in Washington have turned in 127 pounds of mercury and eight pounds of lead for safe disposal with the help from the Washington Department of Ecology. Ecology staff attended miners' rallies in Oroville and Monroe, explaining the state's program for proper disposal of lead and mercury. (ENS 2007).

The mining community of today is, in my opinion, the only group that is in a position with the technology to help with the removal of lead and mercury at a very economical price to the public. Any residual mercury remaining after dredging is that much less to worry about residing in our Nations waterways.

In reviewing Humphrey's (2005) comments regarding possible problems associated with collecting mercury via suction dredging methods, it is right to look to the suction dredge community for help locating hotspots and removing mercury from the river systems. In my opinion the data provided in the report by Humphrey's (2005) did not demonstrate any clear conclusions that would prohibit the State from allowing this activity. On the contrary, in the discussion of results it was stated that a suction dredge in the American River was able to collect 98 percent of the measured mercury processed through the dredge. The amount of mercury collected may have been higher if the investigators had been using a dredge with the modern jet flare design. Even 98 percent is a huge plus for the environment and it would be irresponsible to not allow mercury to be removed from the rivers and streams whenever it is found.

In Humphreys report (2005), the author expressed concern for the loss of a small portion (2%) of the mercury from the back end of the sluice box. In the conclusions it was stated that the amount lost constituted a concentration more than ten times higher than that needed to classify it as hazardous waste. Yet 98 percent of the mercury was now secured and the process did not add any mercury to the system that was not already present. The small fraction lost, because of its density, would relocate back onto the river floor buried in the sediment close to where it was removed while dredging.

Mercury is continuously moved every winter in high storm events. Since the cessation of hydraulic mining, accumulated sediment from hydraulic placer mining has been transported to the Sacramento–San Joaquin Delta and San Francisco Bay by sustained remobilization (James, 1991). Providing a program to collect mercury from miners would aid the Water Board's mission of reducing mercury contamination in the deltas and bays where mercury methylation is a large concern.

In the test described by Humphreys (2005) a small portion of floured mercury was collected in the sediments as it escaped the sluice box. This mercury whether floured before it entered the sluice box, or not, would still be in elemental form. Regardless of surface area it would be no more toxic then the other 98 percent that was suggested to be left in place.

Aside from grossly polluted environments, mercury is normally a problem only where the rate of natural formation of methyl mercury from inorganic mercury is greater than the reverse reaction. Methyl mercury is the only form of mercury that accumulates appreciably in macroinvertebrates and fish. Environments that are known to favor the production of methyl mercury include certain types of wetlands, dilute low-pH lakes in the Northeast and North central United States, parts of the Florida Everglades, newly flooded reservoirs, and coastal wetlands, particularly along the Gulf of Mexico, Atlantic Ocean, and San Francisco Bay (USGS 2000).

If not collected the mercury is guaranteed to end up farther down stream, and eventually in the delta or the bay, where methylation is a real environmental problem. In my opinion it would be a highly irresponsible management practice to leave a large portion of mercury in the rivers and streams because of unrealistic concerns for the lesser amount moving only a short distance away from an operating dredge. Most likely if floured the movement of fine mercury would extend no farther than 50-feet off the end of the sluice box. That would relate to the distance a turbidity plume might extend downstream from a small-scale suction dredge.

However, if the mercury was left in place the next storm event would surely move it downstream closer to, and eventually into, the bay and delta. In fact, according to Humphrey's study in 2005 mercury was seen moving down stream and re-deposited on bedrock already dredge cleaned. The important fact here is mercury was flowing down stream in a suction dredge free zone during lower river flows than what take place under high winter river conditions.

It is most important to reduce the total amount of mercury in the streams and rivers and its transport downstream into the bays and deltas. This is defined as a part of Total Maximum Daily Load ("TMDL") goals.

We know for certain that mercury is transported downstream throughout the winter season during high water events. Therefore, anytime there is the possibility for the removal of mercury by miners it should be undertaken and supported.

You justifiably vetoed that last bill because it was unnecessary and suction dredge mining is already regulated by the Department of Fish and Game. But here we are again....

There was no reason, last year, to sign AB1032 into law and there is no reason to sign Bill 670 into law this year. I respectfully ask that you not add further to the problems related to increased government regulation where none is warranted. Please allow

California Fish and Game to do their job. They are already regulating suction dredging adequately to protect fish. The court has ordered California Department of Fish and Game to prove suction dredging creates significant harm before changing the mining regulations.

I respectfully ask that you VETO bill 670.

Sincerely,

Claudia Wise
34519 Riverside Dr SW
Albany, Oregon 97321
541-990-7009

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ATTACHMENT C

The Economic Impact of Suction Dredging in California

It Starts With the Statistical Analysis Completed by the State of California

An Environmental Impact Report on suction gold dredging was completed by the State of California in 1994. As part of this process, the State sent out two survey questionnaires. The first questionnaire was sent to over 4,000 individuals. Nearly 2,000 were returned completed. The surveys covered dredge locations, annual spending activity, amount invested in dredging equipment, nozzle size and related questions. The second survey was sent to county Boards of Supervisors, Chambers of Commerce and mining businesses to determine the importance of suction gold dredging on local economies. A sample of 1,257 of the individual surveys was used by the State to complete a statistical analysis.

The State of California determined, "Suction dredging is an activity that requires a substantial investment."

According to the State, each dredger spent approximately $6,250 on expenses, which included groceries, restaurants, motels, camp fees and other living expenses. In addition, they reported spending about $3,000 each on gas, oil, equipment maintenance and repairs to suction dredge equipment.

The surveys also found that each permit holder spent an additional $6,000 to purchase a suction dredge and related equipment.

It Includes the Number of Suction Dredge Permits

According to the California Department of Fish & Game, 3,523 permits (2,966 resident and 557 non-resident) were issued in 2008. The State of California collected $126,055 in resident permit fees, and $93,158 in non-resident fees in 2008, for a total of $219,213.

Adjusted for Inflation

Using the CPI to adjust for inflation, suction dredge miners spent approximately $8,967 each on expenses including groceries, restaurants, camp fees and other living expenses in 2008; and $4,304 each on gas, oil, equipment maintenance and repairs to suction dredge equipment in 2008. These two expense categories combined amount to $13,271 for each permit holder.

Using the CPI to adjust for inflation, each permit holder spends approximately $8,608 on a suction dredge and related equipment.

Property Tax Collected

The County Assessors official assessment of mining claims in 6 of the 58 counties is $170,108,821. Mining claim property taxes collected in these counties in 2008 was $1,701,088.

Property tax revenue generated from mining claims was not included in the State's statistical analysis completed in 1994, though it is a matter of fact and is included in our economic impact report.

Known Economic Impacts

- A total of 3,523 suction dredge permit holders spent approximately

$8,967 on expenses including groceries, restaurants, camp fees and other living expenses in 2008, for a total of $31,590,741.

• A total of 3,523 suction dredge permit holders spent approximately $4,304 on gas, oil, equipment maintenance and repairs in 2008, for a total of $15,162,992.

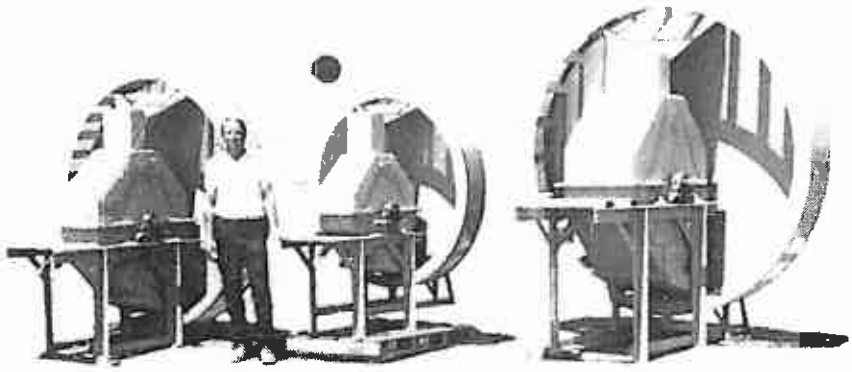
• A total of 3,523 suction dredge permit holders spend approximately $8,608 on a suction dredge and related equipment every four years for a total of $7,581,496 per year.

• Six out of 58 California counties collected $1,701,088 in property taxes.

• The State of California collected $219,213 in dredge permit fees.

The known expenditures by suction dredge permit holders in 2008 amounted to approximately $56,255,530.

Production Impact Mills



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Additional Economic Impacts

• Gold averaged $871.86 per troy ounce in 2008. Just three troy ounces recovered per dredger in 2008 added $9.21 million to the economy.

• Commercial retail rents for manufacturers of suction dredges, such as Keene Engineering, and suppliers and retailers of mining equipment should be added.

• Payroll and property taxes for the above business sectors should be added.

• Suction dredging is regularly conducted by more than just the license holder, but in this report only the permit holder's contributions are included.

• Three of the largest small-scale mining associations are located in California, with a combined membership of over 30,000 paying members and should be added.

• The two largest trade magazines marketed toward small-scale mining are located in California, with a combined circulation of 65,000 and should be added.

• Professional service providers; including geologists, refiners, assayers and mining lawyers should be added.

• Recreational vehicles; including RV's, 4x4's, trailers, all-terrain vehicles and motorcycles should be added.

Conclusion

The 1994 Environmental Impact Report, along with additional information provided here, proves without a doubt that suction dredge miners contribute significant wealth to the economy of California.

These conservative figures demonstrate the economic impact of suction dredging at $65,465,530 million in 2008. The Additional Economic Impacts cited above obviously increases the total to well above $65.46 million.

(The report was authored by Rachel Dunn of Gold Pan California, Pat Keene of Keene Engineering, and Scott Harn of ICMJ's Prospecting and Mining Journal, with the assistance of over 100 additional businesses and individuals who provided supporting documentation.)

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June 6, 2007

Subject: **SUCTION DREDGE MINING**

Dear Board Members,

Thank you for allowing me this opportunity to comment on the water quality aspects of small-scale suction dredge mining.

As I have searched the scientific literature for studies on the effects of small-scale suction dredge mining on the environment I have learned that the preponderance of the published research studies have been directed towards assessment of its effect on the biology of the streams and rivers. In nearly every instance the results have concluded that the effects were less than significant.

In water quality terms some studies have discussed turbidity, water temperature, and suspension of heavy metals into the overlying water. I will focus my water quality comments on these three areas. But first I would like to put this issue in to perspective.

GEOGRAPHICAL SCALE OF SMALL-SCALE SUCTION DREDGING

It has been observed that environmentalists opposing suction dredging use data gleaned from reports that studied effects of environmental perturbations that are occurring on a system-wide basis. For example, they would characterize the affects of turbidity from a suction dredge as if it would impact downstream organisms in a manner that system-wide high water flow events might. This approach is entirely inconsistent with the way in which suction dredges operate or generally impact their downstream environment.

The California Department of Fish and Game (1997) described typical dredging activities as follows' "An individual suction dredge operation **affects a relatively small portion of a stream or river**. A recreational suction dredger (representing 90-percent of all dredgers) may spend a total of four to eight hours per day in the water dredging an area of 1 to 10 square meters. The average number of hours is 5.6 hours per day. The remaining time is spent working on equipment and processing dredged material. The area or length of river or streambed worked by a single suction dredger, as compared to total river length, is relatively small compared to the total available area."

In the Oregon Siskiyou National Forest Dredge Study, Chapter 4, Environmental Consequences, some perspective is given to small-scale mining. "The average claim size is 20 acres. The total acreage of all analyzed claims related to the total acres of watershed is about ***0.2 percent***. The average stream width reflected in the analysis is about 20 feet or

less and the average mining claim is 1320 feet in length. The percentage of land area within riparian zones on the Siskiyou National Forest occupied by mining claims is estimated to be only ***0.1 percent***." The report goes on to say, "Over the past 10 years, approximately 200 suction dredge operators per season operate on the Siskiyou National Forest" (SNF, 2001).

A report from the U.S. Forest Service, Siskiyou National Forest (Cooley, 1995) answered the frequently asked question, "How much material is moved by annual mining suction dredge activities and how much does this figure compare with the natural movement of such materials by surface erosion and mass movement?" The answer was that suction dredges moved a total of 2,413 cubic yards for the season. Cooley (1995) used the most conservative values and estimated that the Siskiyou National Forest would move 331,000 cubic yards of material each year from natural causes. Compared to the 2413 (in-stream) cubic yards re-located by suction mining operations the **movement rate by suction dredge mining would equal *about 0.7% of natural rates***.

It has been suggested that a single operating suction dredge may not pose a problem but the operation of multiple dredges would produce a cumulative effect that could cause harm to aquatic organisms. However, "No additive effects were detected on the Yuba River from 40 active dredges on a 6.8 mile (11 km) stretch. The area most impacted was from the dredge to about 98 feet (30 meters) downstream, for most turbidity and settleable solids (Harvey, B.C., K. McCleneghan, J.D. Linn, and C.L. Langley, 1982). In another study, "Six small dredges (<6 inch dredge nozzle) on a 1.2 mile (2 km) stretch had no additive effect (Harvey, B.C., 1986). *Water quality was typically temporally and spatially restricted to the time and immediate vicinity of the dredge* (North, P.A., 1993).

A report on the water quality cumulative effects of placer mining on the Chugach National Forest, Alaska found that, "The results from water quality sampling do not indicate any strong cumulative effects from multiple placer mining operations within the sampled drainages." "Several suction dredges probably operated simultaneously on the same drainage, but did not affect water quality as evidenced by above and below water sample results. *In the recreational mining area of Resurrection Creek, five and six dredges would be operating and not produce any water quality changes* (Huber and Blanchet, 1992).

The California Department of Fish and Game stated in its Draft Environmental Impact Report that "Department regulations do not currently limit dredger densities but the activity itself is somewhat self-regulating. Suction dredge operators must space themselves apart from each other to avoid working in the turbidity plume of the next operator working upstream. *Suction Dredging requires relatively clear water to successfully harvest gold* " (CDFG, 1997).

ELEVATED TURBIDITY AND SUSPENDED

Suction dredging causes less than significant effects to water quality. The impacts include increased turbidity levels caused by re-suspended streambed sediment and pollution caused by spilling of gas and oil used to operate suction dredges (CDFG, 1997).

"Suction dredges, powered by internal combustion engines of various sizes, operate while floating on the surface of streams and rivers. As such, oil and gas may leak or spill onto the water's surface. ***There have not been any observed or reported cases of harm to plant or wildlife as a result of oil or gas spills associated with suction dredging***" (CDFG, 1997).

The impact of turbidities on water quality caused by suction dredging can vary considerably depending on many factors. Factors which appear to influence the degree and impact of turbidity include the amount and type of fines (fine sediment) in the substrate, the size and number of suction dredges relative to stream flow and reach of stream, and background turbidities (CDFG, 1997).

Because of low ambient levels of turbidity on Butte Creek and the North Fork American River, California, Harvey (1986) easily observed increases of 4 to 5 NTU from suction dredging. Turbidity plumes created by suction dredging in Big East Fork Creek were visible in Canyon Creek 403 feet (123 meters) downstream from the dredges (Somer and Hassler, 1992).

In contrast, Thomas (1985), using a dredge with a 2.5-inch diameter nozzle on Gold Creek, Montana, found that suspended sediment levels returned to ambient levels 100 feet below the dredge. Gold Creek is a relatively undisturbed third order stream with flows of 14 cubic feet per second. A turbidity tail from a 5-inch (12.7 cm) dredge on Clear Creek, California was observable for only 200 feet downstream. Water velocity at the site was about 1 foot per second (Lewis, 1962).

Turbidity below a 2.5 inch suction dredge in two Idaho streams was nearly undetectable even though fine sediment, less than 0.5 mm in diameter, made up 13 to 18 percent, by weight, of substrate in the two streams (Griffith and Andrews, 1981).

"During a dredging test carried out by the California Department of Fish and Game on the north fork of American River, it was concluded that turbidity was greatest immediately downstream, returning to ambient levels within 100 feet. Referring to 52 dredges studied, Harvey (1982) stated "...generally rapid recovery to control levels in both turbidity and settable solids occurred below dredging activity."

Hassler (1986) noted "...during dredging, suspended sediment and turbidity were high immediately below the dredge, but diminished rapidly within distance downstream." He measured 20.5 NTU 4 meters below a 5-inch dredge that dropped off to 3.4 NTU 49 meters below the dredge. Turbidity from a 4-inch dredge dropped from 5.6 NTU 4 meters below to 2.9 NTU 49 meters below with 0.9 NTU above. He further noted "...water

quality was impacted only during the actual operation of the dredge...since a full day of mining by most Canyon Creek operators included only 2 to 4 hours of dredge running time, water quality was impacted for a short time." Also "...the water quality of Canyon Creek was very good and only affected by suction dredging near the dredge when it was operated."

The US Geological Survey and the Alaska Department of Natural Resources conducted a survey into dredging on Alaska's Fortymile River, which is a river designated as a wild and scenic corridor. The study stated, "One dredge had a 10-inch diameter intake hose and was working relatively fine sediment on a smooth but fast section of the river. The other dredge had an 8-inch intake and was working coarser sediments in a shallower reach of the river. State regulations require that suction dredges may not increase the turbidity of the river by more than 5 nephelometric turbidity units (NTU), 500 feet (=150m) downstream. In both cases, the dredges were well within compliance with this regulation."

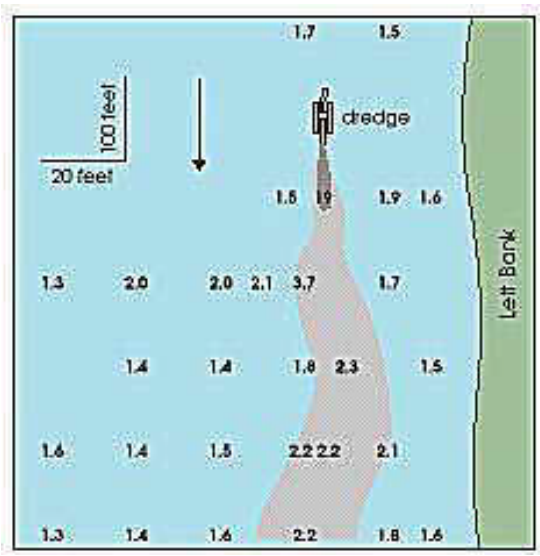

Figure 2. Results of turbidity survey behind an operating 10-inch suction dredge (site #1 on fig. 1). All numbers shown are in NTU, or nephelometric turbidity units; the standard unit of turbidity. The right bank of the river is off the edge of the figure. The approximate shape of the plume is shown in gray. Note that the figure is exaggerated 5x horizontally, so the plume is actually much narrower than it appears in the figure. To comply with State regulations, dredges may not increase the turbidity of the river by more than 5 NTU, 500 feet behind the dredge.

http://www.akmining.com/mine/usgs1.htm

Samples were collected on a grid extending downstream from the dredges as they were operating and compared to measurements made upstream of the dredges. One dredge had a 10-inch diameter intake hose and was working relatively fine sediments on a smooth but fast section of the river. The results of the turbidity survey for the 10-inch dredge are shown on figure 2. Turbidity values behind the 8-inch dredge were lower, because the smaller intake was moving less sediment material, and because the coarser sediments being worked by the 8-inch dredge settled more rapidly

The turbidity values found in the dredge studies fall within the range of turbidity values found for currently mined areas of the Fortymile River and many of its un-mined tributaries. Figure 3 shows the ranges of turbidity values observed along the horizontal axis, and the number of samples that fall within each of those ranges. For example, 25 samples had turbidity between 1.0 and 1.5 NTU, 22 of which were in a dredged area. The

highest turbidity value was from an un-mined tributary to Uhler Creek; the lowest from a number of different tributaries to the North Fork. As seen on the figure, there is no appreciable difference in the distribution of turbidity values between mined and un-mined areas.

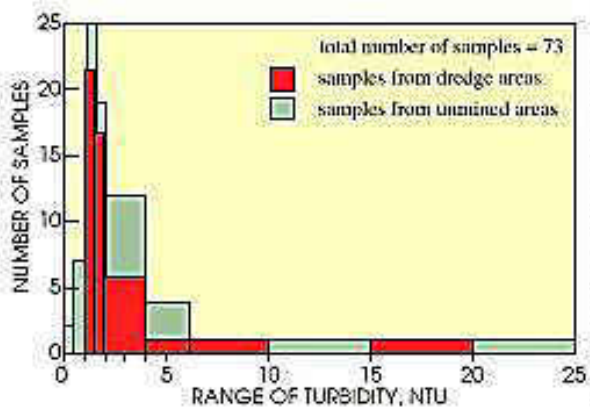

Figure 3. A comparison of turbidity values between mined and unmined areas shows that the suction dredge mining does not affect the turbidity of the Fortymile River system under the conditions studied. The highest turbidity values from the dredge areas are within 200 feet (60 m) of the back of the two operating dredges which were studied.

http://www.akmining.com/mine/usgs1.htm

In American studies, average turbidity levels have been shown to be between 5 and 15 NTU 5 meters below dredges. But even the maximum turbidity level measured in a clay pocket (51 NTU) fell below 10 NTU within 45 meters. Turbidity increases, from even large dredges on moderate sized streams, have shown to be fairly low, usually 25 NTU or less, and to return to background within 30 meters. The impact is localized and short lived; indicating minimum impact on moderate and larger waterways.

Within any waterway, sediment is primarily carried in suspension during periods of rainfall and high flow. This is an important point, as it indicates that a dredging operation has less, or at least no greater effect on sediment mobilization and mobility than a rain storm."

All of these research studies have concluded that only a local significant effect occurs, with it decreasing rapidly downstream. The studies have been wide spread, having been undertaken in Alaska, Idaho, California, Montana and Oregon.

The science supports *de minimus* status for $\leq$ 6-inch suction dredges. Turbidity is *de minimus* according to the U.S. Army Corps of Engineers.

"Effects from elevated levels of turbidity and suspended sediment normally associated with ***suction dredging as regulated in the past in California appear to be less than significant with regard to impacts to fish and other river resources*** because of the level of turbidity created and the short distance downstream of a suction dredge where turbidity levels return to normal" (CDFG, 1997).

Furthermore, individuals that have not, in fact, operated suction dredges may not realize that it is a self-limiting operation. The dredge operator must be able to see his work area to operate safely and manage the intake of the dredge nozzle. ***If high levels of turbidity***

were to flood the dredger's work area and render him "blind" he would have to move the operation to another location.

INCREASING WATER TEMPERATURE

Responsible suction dredge miners do not dredge stream banks (it is illegal). Dredging occurs only in the wetted perimeter of the stream. Therefore, it is unlikely suction dredging will cause a loss of cover adjacent to the stream.

Solar radiation is the single most important energy source for the heating of streams during daytime conditions. The loss or removal of riparian vegetation can increase solar radiation input to a stream increasing stream temperature. ***Suction dredge operations are confined to the existing stream channel and do not affect riparian vegetation or stream shade*** *(SNF, 2001).*

Suction dredging could alter pool dimensions through excavation, deposition of tailings, or by triggering adjustments in channel morphology. Excavating pools could substantially increase their depth and increase cool groundwater inflow. This could reduce pool temperature. If pools were excavated to a depth greater than three feet, salmonid pool habitat could be improved. In addition, ***if excavated pools reduce pool temperatures, they could provide important coldwater habitats for salmonids living in streams with elevated temperatures*** *(SNF, 2001).*

Dredge mining had little, if any, impact on water temperature (Hassler, T.J., W.L. Somer and G.R. Stern, 1986). In addition, the Oregon Siskiyou Dredge Study states, "***There is no evidence that suction dredging affects stream temperature***" *(SNF, 2001).*

Increases in sediment loading to a stream can result in the stream aggrading causing the width of the stream to increase. This width increase can increase the surface area of the water resulting in higher solar radiation absorption and increased stream temperatures. ***Suction dredge operations are again confined to the existing stream channel and do not affect stream width*** *(SNF, 2001).*

Stream temperature can also increase from increasing the stream's width to depth ratio. The suction dredge operation creates piles in the stream channel as the miner digs down into the streambed. The stream flow may split and flow around the pile decreasing or increasing the wetted surface for a few feet. However, within the stream reach that the miner is working in, the change is so minor that the overall wetted surface area can be assumed to be the same so the total solar radiation absorption remains unchanged. ***Suction Dredging results in no measurable increase in stream temperature*** *(SNF, 2001).*

"Small streams with low flows may be significantly affected by suction dredging, particularly when dredged by larger dredges (Larger than 6 inches) (Stern, 1988). However, the California Department of Fish and Game concluded, "current regulations *restrict the maximum nozzle size to 6 inches on most rivers and streams which, in*

conjunction with riparian habitat protective measures, results in ***a less than significant impact to channel morphology***" (CDFG, 1997).

WATER CHEMISTRY

Concern has been raised that small-scale dredge operations may increase the metal load of the surface waters. Whereas dredge operations do re-suspend the bottom sediment, the magnitude of this disturbance on stream metal loading was unknown. It was unknown what affect the dredge operations may have on the transport and redistribution of metals—some of which (for example, arsenic, copper, and zinc) have environmental importance.

The U.S. Geological Survey and the Alaska Department of Natural Resources cooperated in a project, on Fortymile River, to provide scientific data to address these questions. This river is designated a Wild and Scenic Corridor by the Alaska National Interest Lands Conservation Act. Current users of the river include placer mine operators, as well as boaters and rafters. Along the North Fork Fortymile River, and just below its confluence with the South Fork, mining is limited to a few small suction dredges which, combined, produce as much as a few hundred ounces of gold per year. In this area, some potential environmental concerns have been raised associated with the mining activities, including increased turbidity of the river water; adverse impact on the overall chemical quality of the river water; and potential additions of specific toxic elements, such as arsenic, to the river during mining operations.

Field measurements were made for pH, turbidity, electrical conductivity (a measure of the total dissolved concentrations of mineral salts), and stream discharge for the Fortymile River and many of its tributaries. Samples were collected at the same time for chemical analyses, including trace-metal analyses

Water-quality samples were collected at three points 200 feet behind each of the two operating suction dredges. One sample was collected on either side of the plume, and one in the center of the plume. The samples were passed through a filter with a nominal pore size of 0.45 micrometers and acidified to a pH less than about 2. Results are shown in the following table. Samples 1A, 1C, 2A, and 2C are from either side of the plume behind dredges 1 and 2, respectively. Samples 1B and 2B are from the center of each plume. All concentrations given are in micrograms per liter, except pH, which is expressed in standard units.

The data show similar water-quality values for samples collected within and on either side of the dredge plumes. Further, the values shown in the table are roughly equal to or lower than the regional average concentrations for each dissolved metal, based on the analyses of 25 samples collected throughout the area. Therefore, ***suction dredging appears to have no measurable effect on the chemistry of the Fortymile River*** within this study area. We have observed greater variations in the natural stream chemistry in the region than in the dredge areas (Wanty, R.B., B. Wang, and J. Vohden. 1997).

		Side 1	Dredge 1	Side 2		Side 1	Dredge 2	Side 2
		1A	**1B**	**1C**		**2A**	**2B**	**2C**
pH		7.7	7.6	7.8		7.0	7.5	7.5
Arsenic		0.3	0.3	0.3		0.3	0.3	0.3
Iron		110.	110.	110.		100	97	100
Chromium		2	2	3		3	3	3
Cadmium	all less than 0.02 micrograms per liter							
Cobalt		0.07	0.07	0.06		0.06	0.05	0.05
Zinc		0.8	0.6	0.8		1.0	1.0	1.0
Lead	all less than 0.05 micrograms per liter							

A final report from an EPA contract for analysis of the effects on mining in the Fortymile River, Alaska stated, "This report describes the results of our research during 1997 and 1998 into the effects of commercial suction dredging on the water quality, habitat, and biota of the Fortymile River…. The focus of our work on the Fortymile in 1997 was on an 8-inch suction dredge (Site 1), located on the mainstem… At Site 1, dredge operation had no discernable effect on alkalinity, hardness, or specific conductance of water in the Fortymile. Of the factors we measured, the primary effects of suction dredging on water chemistry of the Fortymile River were increased turbidity, total filterable solids, and copper and zinc concentrations downstream of the dredge. These variables returned to upstream levels within 80-160 m downstream of the dredge. The results from this sampling revealed a relatively intense, but localized, decline in water clarity during the time the dredge was operating" (Prussian, A.M., T.V. Royer and G.W. Minshall, 1999).

"The data collected for this study help establish regional background geochemical values for the waters in the Fortymile River system. As seen in the chemical and turbidity data **any variations in water quality due to the suction dredging activity fall within the natural variations in water quality**" (Prussian, A.M., T.V. Royer and G.W. Minshall, 1999).

REMOVAL OF MERCURY FROM THE ENVIRONMENT

Looking for gold in California streams and rivers is a recreational activity for thousands of state residents. As these miners remove sediments, sands, and gravel from streams and former mine sites to separate out the gold, they are also removing mercury. This mercury

is the remnant of millions of pounds of pure mercury that was added to sluice boxes used by historic mining operations between 1850 and 1890. Modern day small-scale gold suction dredgers do not use mercury to recover gold during the operation of the dredge. Therefore, any gold that would be found in their possession would be that which was extracted from the stream or river they are working.

Taking mercury out of streams benefits the environment. Efforts to collect mercury from recreational gold miners in the past, however, have been stymied due to perceived regulatory barriers. Disposal of mercury is normally subject to all regulations applicable to hazardous waste.

In 2000, EPA and California's Division of Toxic Substance Control worked in concert with other State and local agencies to find the regulatory flexibility needed to collect mercury in a simple and effective manner. In August and September, 2000 the first mercury "milk runs" collected 230 pounds of mercury. A Nevada County household waste collection event held in September 2000 collected about 10 pounds of mercury. The total amount of mercury collected was equivalent to the mercury load in 47 years worth of wastewater discharge from the city of Sacramento's sewage treatment plant or the mercury in a million mercury thermometers. This successful pilot program demonstrates how recreational gold miners and government agencies can work together to protect the environment (US EPA, 2001).

Mercury occurs in several different geochemical forms, including elemental mercury, ionic (or oxidized) mercury, and a suite of organic forms, the most important of which is methylmercury. Methylmercury is the form most readily incorporated into biological tissues and is most toxic to humans. The process of mercury removal by suction dredging does not contaminate the environment because small-scale suction dredging removes elemental mercury. Removal of elemental mercury before it can be converted, by bacteria, to methylmercury is a very important component of environmental and human health protection provided as a secondary benefit of suction dredging..

THE REAL ISSUE

The issue of localized conflict with suction dredgers and other outdoor recreational activities can be put into a more reasonable perspective using the data provided at the beginning of this report. For example, the total acreage of all analyzed claims related to the total acres of watershed is about *0.2 percent*. The percentage of land area within riparian zones on the Siskiyou National Forest occupied by mining claims is estimated to be only *0.1 percent*." The report goes on to say, "Over the past 10 years, approximately 200 suction dredge operators per season operate on the Siskiyou National Forest (SNF, 2001).

The issue against suction dredge operations in the streams of the United States appears to be less an issue of environmental protection and more of an issue of certain organized individuals and groups being unwilling to share the outdoors with others without like interests.

Management of the Fortymile River region (a beautiful, wild and scenic river in the remote part of east-central Alaska) and its resources is complex due to the many diverse land-use options. Small-scale, family-owned gold mining has been active on the Fortymile since the "gold rush" days of the late 1880's. However, in 1980, the Fortymile River and many of its tributaries received Wild and Scenic River status. Because of this status, mining along the river must compete with recreational usage such as rafting, canoeing, and fishing.

A press release from the U. S. Geological Survey stated, in part, the following, "The water quality of the Fortymile River-a beautiful, …has not been adversely impacted by gold placer mining operations according to an integrated study underway by the U.S. Geological Survey and the Alaska Department of Natural Resources.

Violation of mining discharge regulations would close down the small-scale mining operations. No data existed before this study to establish if the mining was degrading the water quality. **However, even with the absence of data, environmental groups were active to close down mining on the river citing unsubstantiated possible discharge violations.**

This study has found no violations to date to substantiate closure of the small-scale mining operations. The result is a continuance of a way of life on the last American frontier." (U.S. Geological Survey October 27, 1998). I have no doubt that this is the real issue currently facing small-scale gold suction dredgers in California.

Suction dredges do not add pollution to the aquatic environment. They merely re - suspend and re-locate the bottom materials (overburden) within the river or stream.

I hope this scientific research information I have provided will be helpful in your efforts regarding suction dredge mining and water quality. I thank you for this opportunity to submit this data.

Respectfully Yours,

Joseph C. Greene
Research Biologist, U.S. EPA **Retired**

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June 6, 2007

Subject: **SUCTION DREDGE MINING**

Dear Board Members,

Thank you for allowing me this opportunity to comment on the water quality aspects of small-scale suction dredge mining.

As I have searched the scientific literature for studies on the effects of small-scale suction dredge mining on the environment I have learned that the preponderance of the published research studies have been directed towards assessment of its effect on the biology of the streams and rivers. In nearly every instance the results have concluded that the effects were less than significant.

In water quality terms some studies have discussed turbidity, water temperature, and suspension of heavy metals into the overlying water. I will focus my water quality comments on these three areas. But first I would like to put this issue in to perspective.

GEOGRAPHICAL SCALE OF SMALL-SCALE SUCTION DREDGING

It has been observed that environmentalists opposing suction dredging use data gleaned from reports that studied effects of environmental perturbations that are occurring on a system-wide basis. For example, they would characterize the affects of turbidity from a suction dredge as if it would impact downstream organisms in a manner that system-wide high water flow events might. This approach is entirely inconsistent with the way in which suction dredges operate or generally impact their downstream environment.

The California Department of Fish and Game (1997) described typical dredging activities as follows' "An individual suction dredge operation **affects a relatively small portion of a stream or river**. A recreational suction dredger (representing 90-percent of all dredgers) may spend a total of four to eight hours per day in the water dredging an area of 1 to 10 square meters. The average number of hours is 5.6 hours per day. The remaining time is spent working on equipment and processing dredged material. The area or length of river or streambed worked by a single suction dredger, as compared to total river length, is relatively small compared to the total available area."

In the Oregon Siskiyou National Forest Dredge Study, Chapter 4, Environmental Consequences, some perspective is given to small-scale mining. "The average claim size is 20 acres. The total acreage of all analyzed claims related to the total acres of watershed is about ***0.2 percent***. The average stream width reflected in the analysis is about 20 feet or

less and the average mining claim is 1320 feet in length. The percentage of land area within riparian zones on the Siskiyou National Forest occupied by mining claims is estimated to be only ***0.1 percent***." The report goes on to say, "Over the past 10 years, approximately 200 suction dredge operators per season operate on the Siskiyou National Forest" (SNF, 2001).

A report from the U.S. Forest Service, Siskiyou National Forest (Cooley, 1995) answered the frequently asked question, "How much material is moved by annual mining suction dredge activities and how much does this figure compare with the natural movement of such materials by surface erosion and mass movement?" The answer was that suction dredges moved a total of 2,413 cubic yards for the season. Cooley (1995) used the most conservative values and estimated that the Siskiyou National Forest would move 331,000 cubic yards of material each year from natural causes. Compared to the 2413 (in-stream) cubic yards re-located by suction mining operations the **movement rate by suction dredge mining would equal *about 0.7% of natural rates***.

It has been suggested that a single operating suction dredge may not pose a problem but the operation of multiple dredges would produce a cumulative effect that could cause harm to aquatic organisms. However, "No additive effects were detected on the Yuba River from 40 active dredges on a 6.8 mile (11 km) stretch. The area most impacted was from the dredge to about 98 feet (30 meters) downstream, for most turbidity and settleable solids (Harvey, B.C., K. McCleneghan, J.D. Linn, and C.L. Langley, 1982). In another study, "Six small dredges (<6 inch dredge nozzle) on a 1.2 mile (2 km) stretch had no additive effect (Harvey, B.C., 1986). *Water quality was typically temporally and spatially restricted to the time and immediate vicinity of the dredge* (North, P.A., 1993).

A report on the water quality cumulative effects of placer mining on the Chugach National Forest, Alaska found that, "The results from water quality sampling do not indicate any strong cumulative effects from multiple placer mining operations within the sampled drainages." "Several suction dredges probably operated simultaneously on the same drainage, but did not affect water quality as evidenced by above and below water sample results. *In the recreational mining area of Resurrection Creek, five and six dredges would be operating and not produce any water quality changes* (Huber and Blanchet, 1992).

The California Department of Fish and Game stated in its Draft Environmental Impact Report that "Department regulations do not currently limit dredger densities but the activity itself is somewhat self-regulating. Suction dredge operators must space themselves apart from each other to avoid working in the turbidity plume of the next operator working upstream. *Suction Dredging requires relatively clear water to successfully harvest gold* " (CDFG, 1997).

ELEVATED TURBIDITY AND SUSPENDED

Suction dredging causes less than significant effects to water quality. The impacts include increased turbidity levels caused by re-suspended streambed sediment and pollution caused by spilling of gas and oil used to operate suction dredges (CDFG, 1997).

"Suction dredges, powered by internal combustion engines of various sizes, operate while floating on the surface of streams and rivers. As such, oil and gas may leak or spill onto the water's surface. ***There have not been any observed or reported cases of harm to plant or wildlife as a result of oil or gas spills associated with suction dredging"*** (CDFG, 1997).

The impact of turbidities on water quality caused by suction dredging can vary considerably depending on many factors. Factors which appear to influence the degree and impact of turbidity include the amount and type of fines (fine sediment) in the substrate, the size and number of suction dredges relative to stream flow and reach of stream, and background turbidities (CDFG, 1997).

Because of low ambient levels of turbidity on Butte Creek and the North Fork American River, California, Harvey (1986) easily observed increases of 4 to 5 NTU from suction dredging. Turbidity plumes created by suction dredging in Big East Fork Creek were visible in Canyon Creek 403 feet (123 meters) downstream from the dredges (Somer and Hassler, 1992).

In contrast, Thomas (1985), using a dredge with a 2.5-inch diameter nozzle on Gold Creek, Montana, found that suspended sediment levels returned to ambient levels 100 feet below the dredge. Gold Creek is a relatively undisturbed third order stream with flows of 14 cubic feet per second. A turbidity tail from a 5-inch (12.7 cm) dredge on Clear Creek, California was observable for only 200 feet downstream. Water velocity at the site was about 1 foot per second (Lewis, 1962).

Turbidity below a 2.5 inch suction dredge in two Idaho streams was nearly undetectable even though fine sediment, less than 0.5 mm in diameter, made up 13 to 18 percent, by weight, of substrate in the two streams (Griffith and Andrews, 1981).

"During a dredging test carried out by the California Department of Fish and Game on the north fork of American River, it was concluded that turbidity was greatest immediately downstream, returning to ambient levels within 100 feet. Referring to 52 dredges studied, Harvey (1982) stated "...generally rapid recovery to control levels in both turbidity and settable solids occurred below dredging activity."

Hassler (1986) noted "...during dredging, suspended sediment and turbidity were high immediately below the dredge, but diminished rapidly within distance downstream." He measured 20.5 NTU 4 meters below a 5-inch dredge that dropped off to 3.4 NTU 49 meters below the dredge. Turbidity from a 4-inch dredge dropped from 5.6 NTU 4 meters below to 2.9 NTU 49 meters below with 0.9 NTU above. He further noted "...water

quality was impacted only during the actual operation of the dredge...since a full day of mining by most Canyon Creek operators included only 2 to 4 hours of dredge running time, water quality was impacted for a short time." Also "...the water quality of Canyon Creek was very good and only affected by suction dredging near the dredge when it was operated."

The US Geological Survey and the Alaska Department of Natural Resources conducted a survey into dredging on Alaska's Fortymile River, which is a river designated as a wild and scenic corridor. The study stated, "One dredge had a 10-inch diameter intake hose and was working relatively fine sediment on a smooth but fast section of the river. The other dredge had an 8-inch intake and was working coarser sediments in a shallower reach of the river. State regulations require that suction dredges may not increase the turbidity of the river by more than 5 nephelometric turbidity units (NTU), 500 feet (=150m) downstream. In both cases, the dredges were well within compliance with this regulation."

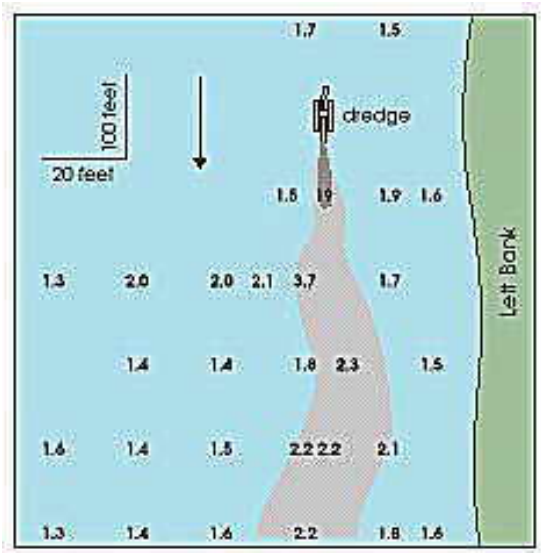

Figure 2. Results of turbidity survey behind an operating 10-inch suction dredge (site #1 on fig. 1). All numbers shown are in NTU, or nephelometric turbidity units; the standard unit of turbidity. The right bank of the river is off the edge of the figure. The approximate shape of the plume is shown in gray. Note that the figure is exaggerated 5x horizontally, so the plume is actually much narrower than it appears in the figure. To comply with State regulations, dredges may not increase the turbidity of the river by more than 5 NTU, 500 feet behind the dredge.

http://www.akmining.com/mine/usgs1.htm

Samples were collected on a grid extending downstream from the dredges as they were operating and compared to measurements made upstream of the dredges. One dredge had a 10-inch diameter intake hose and was working relatively fine sediments on a smooth but fast section of the river. The results of the turbidity survey for the 10-inch dredge are shown on figure 2. Turbidity values behind the 8-inch dredge were lower, because the smaller intake was moving less sediment material, and because the coarser sediments being worked by the 8-inch dredge settled more rapidly

The turbidity values found in the dredge studies fall within the range of turbidity values found for currently mined areas of the Fortymile River and many of its un-mined tributaries. Figure 3 shows the ranges of turbidity values observed along the horizontal axis, and the number of samples that fall within each of those ranges. For example, 25 samples had turbidity between 1.0 and 1.5 NTU, 22 of which were in a dredged area. The

highest turbidity value was from an un-mined tributary to Uhler Creek; the lowest from a number of different tributaries to the North Fork. As seen on the figure, there is no appreciable difference in the distribution of turbidity values between mined and un-mined areas.

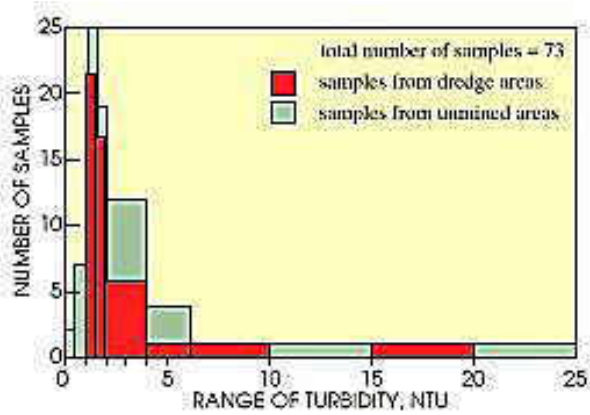

Figure 3. A comparison of turbidity values between mined and unmined areas shows that the suction dredge mining does not affect the turbidity of the Fortymile River system under the conditions studied. The highest turbidity values from the dredge areas are within 200 feet (60 m) of the back of the two operating dredges which were studied.

http://www.akmining.com/mine/usgs1.htm

In American studies, average turbidity levels have been shown to be between 5 and 15 NTU 5 meters below dredges. But even the maximum turbidity level measured in a clay pocket (51 NTU) fell below 10 NTU within 45 meters. Turbidity increases, from even large dredges on moderate sized streams, have shown to be fairly low, usually 25 NTU or less, and to return to background within 30 meters. The impact is localized and short lived; indicating minimum impact on moderate and larger waterways.

Within any waterway, sediment is primarily carried in suspension during periods of rainfall and high flow. This is an important point, as it indicates that a dredging operation has less, or at least no greater effect on sediment mobilization and mobility than a rain storm."

All of these research studies have concluded that only a local significant effect occurs, with it decreasing rapidly downstream. The studies have been wide spread, having been undertaken in Alaska, Idaho, California, Montana and Oregon.

The science supports *de minimus* status for $\leq$ 6-inch suction dredges. Turbidity is *de minimus* according to the U.S. Army Corps of Engineers.

“Effects from elevated levels of turbidity and suspended sediment normally associated with ***suction dredging as regulated in the past in California appear to be less than significant with regard to impacts to fish and other river resources*** because of the level of turbidity created and the short distance downstream of a suction dredge where turbidity levels return to normal” (CDFG, 1997).

Furthermore, individuals that have not, in fact, operated suction dredges may not realize that it is a self-limiting operation. The dredge operator must be able to see his work area to operate safely and manage the intake of the dredge nozzle. ***If high levels of turbidity***

were to flood the dredger's work area and render him "blind" he would have to move the operation to another location.

INCREASING WATER TEMPERATURE

Responsible suction dredge miners do not dredge stream banks (it is illegal). Dredging occurs only in the wetted perimeter of the stream. Therefore, it is unlikely suction dredging will cause a loss of cover adjacent to the stream.

Solar radiation is the single most important energy source for the heating of streams during daytime conditions. The loss or removal of riparian vegetation can increase solar radiation input to a stream increasing stream temperature. ***Suction dredge operations are confined to the existing stream channel and do not affect riparian vegetation or stream shade*** *(SNF, 2001).*

Suction dredging could alter pool dimensions through excavation, deposition of tailings, or by triggering adjustments in channel morphology. Excavating pools could substantially increase their depth and increase cool groundwater inflow. This could reduce pool temperature. If pools were excavated to a depth greater than three feet, salmonid pool habitat could be improved. In addition, ***if excavated pools reduce pool temperatures, they could provide important coldwater habitats for salmonids living in streams with elevated temperatures*** *(SNF, 2001).*

Dredge mining had little, if any, impact on water temperature (Hassler, T.J., W.L. Somer and G.R. Stern, 1986). In addition, the Oregon Siskiyou Dredge Study states, "***There is no evidence that suction dredging affects stream temperature***" *(SNF, 2001).*

Increases in sediment loading to a stream can result in the stream aggrading causing the width of the stream to increase. This width increase can increase the surface area of the water resulting in higher solar radiation absorption and increased stream temperatures. ***Suction dredge operations are again confined to the existing stream channel and do not affect stream width*** *(SNF, 2001).*

Stream temperature can also increase from increasing the stream's width to depth ratio. The suction dredge operation creates piles in the stream channel as the miner digs down into the streambed. The stream flow may split and flow around the pile decreasing or increasing the wetted surface for a few feet. However, within the stream reach that the miner is working in, the change is so minor that the overall wetted surface area can be assumed to be the same so the total solar radiation absorption remains unchanged. ***Suction Dredging results in no measurable increase in stream temperature*** *(SNF, 2001).*

"Small streams with low flows may be significantly affected by suction dredging, particularly when dredged by larger dredges (Larger than 6 inches) (Stern, 1988). However, the California Department of Fish and Game concluded, "current regulations *restrict the maximum nozzle size to 6 inches on most rivers and streams which, in*

conjunction with riparian habitat protective measures, results in ***a less than significant impact to channel morphology***" (CDFG, 1997).

WATER CHEMISTRY

Concern has been raised that small-scale dredge operations may increase the metal load of the surface waters. Whereas dredge operations do re-suspend the bottom sediment, the magnitude of this disturbance on stream metal loading was unknown. It was unknown what affect the dredge operations may have on the transport and redistribution of metals—some of which (for example, arsenic, copper, and zinc) have environmental importance.

The U.S. Geological Survey and the Alaska Department of Natural Resources cooperated in a project, on Fortymile River, to provide scientific data to address these questions. This river is designated a Wild and Scenic Corridor by the Alaska National Interest Lands Conservation Act. Current users of the river include placer mine operators, as well as boaters and rafters. Along the North Fork Fortymile River, and just below its confluence with the South Fork, mining is limited to a few small suction dredges which, combined, produce as much as a few hundred ounces of gold per year. In this area, some potential environmental concerns have been raised associated with the mining activities, including increased turbidity of the river water; adverse impact on the overall chemical quality of the river water; and potential additions of specific toxic elements, such as arsenic, to the river during mining operations.

Field measurements were made for pH, turbidity, electrical conductivity (a measure of the total dissolved concentrations of mineral salts), and stream discharge for the Fortymile River and many of its tributaries. Samples were collected at the same time for chemical analyses, including trace-metal analyses

Water-quality samples were collected at three points 200 feet behind each of the two operating suction dredges. One sample was collected on either side of the plume, and one in the center of the plume. The samples were passed through a filter with a nominal pore size of 0.45 micrometers and acidified to a pH less than about 2. Results are shown in the following table. Samples 1A, 1C, 2A, and 2C are from either side of the plume behind dredges 1 and 2, respectively. Samples 1B and 2B are from the center of each plume. All concentrations given are in micrograms per liter, except pH, which is expressed in standard units.

The data show similar water-quality values for samples collected within and on either side of the dredge plumes. Further, the values shown in the table are roughly equal to or lower than the regional average concentrations for each dissolved metal, based on the analyses of 25 samples collected throughout the area. Therefore, ***suction dredging appears to have no measurable effect on the chemistry of the Fortymile River*** within this study area. We have observed greater variations in the natural stream chemistry in the region than in the dredge areas (Wanty, R.B., B. Wang, and J. Vohden. 1997).

		Side 1	Dredge 1	Side 2		Side 1	Dredge 2	Side 2
		1A	**1B**	**1C**		**2A**	**2B**	**2C**
pH		7.7	7.6	7.8		7.0	7.5	7.5
Arsenic		0.3	0.3	0.3		0.3	0.3	0.3
Iron		110.	110.	110.		100	97	100
Chromium		2	2	3		3	3	3
Cadmium	all less than 0.02 micrograms per liter							
Cobalt		0.07	0.07	0.06		0.06	0.05	0.05
Zinc		0.8	0.6	0.8		1.0	1.0	1.0
Lead	all less than 0.05 micrograms per liter							

A final report from an EPA contract for analysis of the effects on mining in the Fortymile River, Alaska stated, "This report describes the results of our research during 1997 and 1998 into the effects of commercial suction dredging on the water quality, habitat, and biota of the Fortymile River…. The focus of our work on the Fortymile in 1997 was on an 8-inch suction dredge (Site 1), located on the mainstem… At Site 1, dredge operation had no discernable effect on alkalinity, hardness, or specific conductance of water in the Fortymile. Of the factors we measured, the primary effects of suction dredging on water chemistry of the Fortymile River were increased turbidity, total filterable solids, and copper and zinc concentrations downstream of the dredge. These variables returned to upstream levels within 80-160 m downstream of the dredge. The results from this sampling revealed a relatively intense, but localized, decline in water clarity during the time the dredge was operating" (Prussian, A.M., T.V. Royer and G.W. Minshall, 1999).

"The data collected for this study help establish regional background geochemical values for the waters in the Fortymile River system. As seen in the chemical and turbidity data **any variations in water quality due to the suction dredging activity fall within the natural variations in water quality**" (Prussian, A.M., T.V. Royer and G.W. Minshall, 1999).

REMOVAL OF MERCURY FROM THE ENVIRONMENT

Looking for gold in California streams and rivers is a recreational activity for thousands of state residents. As these miners remove sediments, sands, and gravel from streams and former mine sites to separate out the gold, they are also removing mercury. This mercury

is the remnant of millions of pounds of pure mercury that was added to sluice boxes used by historic mining operations between 1850 and 1890. Modern day small-scale gold suction dredgers do not use mercury to recover gold during the operation of the dredge. Therefore, any gold that would be found in their possession would be that which was extracted from the stream or river they are working.

Taking mercury out of streams benefits the environment. Efforts to collect mercury from recreational gold miners in the past, however, have been stymied due to perceived regulatory barriers. Disposal of mercury is normally subject to all regulations applicable to hazardous waste.

In 2000, EPA and California's Division of Toxic Substance Control worked in concert with other State and local agencies to find the regulatory flexibility needed to collect mercury in a simple and effective manner. In August and September, 2000 the first mercury "milk runs" collected 230 pounds of mercury. A Nevada County household waste collection event held in September 2000 collected about 10 pounds of mercury. The total amount of mercury collected was equivalent to the mercury load in 47 years worth of wastewater discharge from the city of Sacramento's sewage treatment plant or the mercury in a million mercury thermometers. This successful pilot program demonstrates how recreational gold miners and government agencies can work together to protect the environment (US EPA, 2001).

Mercury occurs in several different geochemical forms, including elemental mercury, ionic (or oxidized) mercury, and a suite of organic forms, the most important of which is methylmercury. Methylmercury is the form most readily incorporated into biological tissues and is most toxic to humans. The process of mercury removal by suction dredging does not contaminate the environment because small-scale suction dredging removes elemental mercury. Removal of elemental mercury before it can be converted, by bacteria, to methylmercury is a very important component of environmental and human health protection provided as a secondary benefit of suction dredging..

THE REAL ISSUE

The issue of localized conflict with suction dredgers and other outdoor recreational activities can be put into a more reasonable perspective using the data provided at the beginning of this report. For example, the total acreage of all analyzed claims related to the total acres of watershed is about *0.2 percent*. The percentage of land area within riparian zones on the Siskiyou National Forest occupied by mining claims is estimated to be only *0.1 percent*." The report goes on to say, "Over the past 10 years, approximately 200 suction dredge operators per season operate on the Siskiyou National Forest (SNF, 2001).

The issue against suction dredge operations in the streams of the United States appears to be less an issue of environmental protection and more of an issue of certain organized individuals and groups being unwilling to share the outdoors with others without like interests.

Management of the Fortymile River region (a beautiful, wild and scenic river in the remote part of east-central Alaska) and its resources is complex due to the many diverse land-use options. Small-scale, family-owned gold mining has been active on the Fortymile since the "gold rush" days of the late 1880's. However, in 1980, the Fortymile River and many of its tributaries received Wild and Scenic River status. Because of this status, mining along the river must compete with recreational usage such as rafting, canoeing, and fishing.

A press release from the U. S. Geological Survey stated, in part, the following, "The water quality of the Fortymile River-a beautiful, …has not been adversely impacted by gold placer mining operations according to an integrated study underway by the U.S. Geological Survey and the Alaska Department of Natural Resources.

Violation of mining discharge regulations would close down the small-scale mining operations. No data existed before this study to establish if the mining was degrading the water quality. **However, even with the absence of data, environmental groups were active to close down mining on the river citing unsubstantiated possible discharge violations.**

This study has found no violations to date to substantiate closure of the small-scale mining operations. The result is a continuance of a way of life on the last American frontier." (U.S. Geological Survey October 27, 1998). I have no doubt that this is the real issue currently facing small-scale gold suction dredgers in California.

Suction dredges do not add pollution to the aquatic environment. They merely re - suspend and re-locate the bottom materials (overburden) within the river or stream.

I hope this scientific research information I have provided will be helpful in your efforts regarding suction dredge mining and water quality. I thank you for this opportunity to submit this data.

Respectfully Yours,

Joseph C. Greene
Research Biologist, U.S. EPA **Retired**

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California Department of Fish and Game already regulates the miners out of the waterways during important life events for the Salmon. That includes during spawning season when redds are present.

It is well known that suction dredging causes little or no environmental harm to fish and biota what many overlook are the many benefits that dredging provides such as increased spawning gravels, dredge made refugia, and yes, mercury remediation to name a few.

Suction dredging breaks up cemented riverbeds providing fish with loose gravel for future spawning grounds in areas fish presently are not able to use for spawning. Between 1996 and 1998, Quihillalt (1999) found 4% of redds where located on or within 1000 m of dredge tailings. He theorized that dredge tailings may be attractive sites for redd construction because tailings are often located near riffle crests where fish frequently spawn, and they provide loose, appropriately sized substrate. However, embryos in tailings may suffer high mortality during years of high river flows (1998) and be of no concern during years of low river flows (1996 & 1997).

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Dredge holes can provide a holding place for fish as they pass up the waterway on their migration path to and from the ocean providing a place to get out of the faster currents to rest. Some of these dredge holes may also be cooler due to ground water seepage if the holes are deep enough. This leads to development of additional areas of needed refugia.

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The mining community of today is, in my opinion, the only group that is in a position with the technology to help with the removal of lead and mercury at a very economical price to the public. Any residual mercury remaining after dredging is that much less to worry about residing in our Nations waterways.

In reviewing Humphrey's (2005) comments regarding possible problems associated with collecting mercury via suction dredging methods, it is right to look to the suction dredge community for help locating hotspots and removing mercury from the river systems. In my opinion the data provided in the report by Humphrey's (2005) did not demonstrate any clear conclusions that would prohibit the State from allowing this activity. On the contrary, in the discussion of results it was stated that a suction dredge in the American River was able to collect 98 percent of the measured mercury processed through the dredge. The amount of mercury collected may have been higher if the investigators had been using a dredge with the modern jet flare design. Even 98 percent is a huge plus for the environment and it would be irresponsible to not allow mercury to be removed from the rivers and streams whenever it is found.

In Humphreys report (2005), the author expressed concern for the loss of a small portion (2%) of the mercury from the back end of the sluice box. In the conclusions it was stated that the amount lost constituted a concentration more than ten times higher than that needed to classify it as hazardous waste. Yet 98 percent of the mercury was now secured and the process did not add any mercury to the system that was not already present. The small fraction lost, because of its density, would relocate back onto the river floor buried in the sediment close to where it was removed while dredging.

Mercury is continuously moved every winter in high storm events. Since the cessation of hydraulic mining, accumulated sediment from hydraulic placer mining has been transported to the Sacramento–San Joaquin Delta and San Francisco Bay by sustained remobilization (James, 1991). Providing a program to collect mercury from miners would aid the Water Board’s mission of reducing mercury contamination in the deltas and bays where mercury methylation is a large concern.

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The Economic Impact of Suction Dredging in California

It Starts With the Statistical Analysis Completed by the State of California

An Environmental Impact Report on suction gold dredging was completed by the State of California in 1994. As part of this process, the State sent out two survey questionnaires. The first questionnaire was sent to over 4,000 individuals. Nearly 2,000 were returned completed. The surveys covered dredge locations, annual spending activity, amount invested in dredging equipment, nozzle size and related questions. The second survey was sent to county Boards of Supervisors, Chambers of Commerce and mining businesses to determine the importance of suction gold dredging on local economies. A sample of 1,257 of the individual surveys was used by the State to complete a statistical analysis.

The State of California determined, "Suction dredging is an activity that requires a substantial investment."

According to the State, each dredger spent approximately $6,250 each on expenses which included groceries, restaurants, motels, camp fees and other living expenses. In addition, they reported spending about $3,000 each on gas, oil, equipment maintenance and repairs to suction dredge equipment.

The surveys also found that each person permit holder spent an additional $6,000 to purchase a suction dredge and related equipment.

It Includes the Number of Suction Dredge Permits

According to the California Department of Fish & Game, 3,523 permits (2,966 resident and 557 non-resident) were issued in 2008. The State of California collected $126,055 in resident permit fees, and $93,158 in non-resident fees in 2008, for a total of $219,213.

Adjusted for Inflation

Using the CPI to adjust for inflation, suction dredge miners spent approximately $8,967 each on expenses including groceries, restaurants, camp fees and other living expenses in 2008; and $4,304 each on gas, oil, equipment maintenance and repairs to suction dredge equipment in 2008. These two expense categories combined amount to $13,271 for each permit holder.

Using the CPI to adjust for inflation, each permit holder spends approximately $8,608 on a suction dredge and related equipment.

Property Tax Collected

The County Assessors official assessment of mining claims in 6 of the 58 counties is $170,108,821. Mining claim property taxes collected in these counties in 2008 was $1,701,088.

Property tax revenue generated from mining claims was not included in the State's statistical analysis completed in 1994, though it is a matter of fact and is included in our economic impact report.

Known Economic Impacts

• A total of 3,523 suction dredge permit holders spent approximately $8,967 on expenses including groceries, restaurants, camp fees and other living expenses in 2008, for a total of $31,590,741.

• A total of 3,523 suction dredge permit holders spent approximately $4,304 on gas, oil, equipment maintenance and repairs in 2008, for a total of $15,162,992.

• A total of 3,523 suction dredge permit holders spend approximately $8,608 on a suction dredge and related equipment every four years for a total of $7,581,496 per year.

• Six out of 58 California counties collected $1,701,088 in property taxes.

• The State of California collected $219,213 in dredge permit fees.

The known expenditures by suction dredge permit holders in 2008 amounted to approximately $56,255,530.

Additional Economic Impacts

• Gold averaged $871.86 per troy ounce in 2008. Just three troy ounces recovered per dredger in 2008 added $9.21 million to the economy.

• Commercial retail rents for manufacturers of suction dredges, such as Keene Engineering, and suppliers and retailers of mining equipment should be added.

• Payroll and property taxes for the above business sectors should be added.

• Suction dredging is regularly conducted by more than just the license holder, but in this report only the permit holder's contributions are included.

• Three of the largest small-scale mining associations are located in California, with a combined membership of over 30,000 paying members and should be added.

• The two largest trade magazines marketed toward small-scale mining are located in California, with a combined circulation of 65,000 and should be added.

• Professional service providers; including geologists, refiners, assayers and mining lawyers should be added.

• Recreational vehicles; including RV's, 4x4's, trailers, all-terrain vehicles and motorcycles should be added.

Conclusion

The 1994 Environmental Impact Report, along with additional information provided here, proves without a doubt that suction dredge miners contribute significant wealth to the economy of California.

These conservative figures demonstrate the economic impact of suction dredging at $65,465,530 million in 2008. The Additional Economic Impacts cited above obviously increase the total well above the $60 million assertion.

(*The report was authored by Rachel Dunn of Gold Pan California, Pat Keene of Keene Engineering, and Scott Harn of ICMJ's Prospecting and Mining Journal, with the assistance of over 100 additional businesses and individuals who provided supporting documentation.*)

Karuk Tribe • Yurok Tribe • Klamath Riverkeeper • Pacific Coast Federation of Fishermen's Associations • Institute for Fisheries Resources • Center for Biological Diversity • California Trout • American Whitewater • Friends of the River • Environmental Law Foundation • Friends of Trinity River • The Butte Environmental Council • Northern California Council, Federation of Fly Fishers • The Sierra Fund • California Tribal Business Alliance • California Association of Tribal Governments • Environmental Justice Coalition for Water • Klamath-Siskiyou Wildlands Center • Rogue Riverkeeper • Environmental Protection and Information Center • Northcoast Environmental Center • California Sportfishing Protection Alliance

December 3, 2009

Mark Stopher
California Department of Fish and Game
601 Locust Street
Redding, CA 96001

Dear Mr. Stopher:

The Commenters who worked collaboratively on this document appreciate the opportunity to submit these written comments. We look forward to working with the Department to revise suction dredge mining rules in order to ensure that the activity has no deleterious affect on fish and wildlife and meets all applicable laws.

These comments should be considered as additions to comments submitted by the Karuk Tribe and others in response to the October, 2007 Public Notice by the Department (submitted on December 17, 2007) and comments submitted by the Karuk Tribe and others to the State Water Resources Control Board in June 2007 regarding suction dredge impacts on water quality.

These comments are submitted on behalf of the following groups and governments: Karuk Tribe, Yurok Tribe, Klamath Riverkeeper, Pacific Coast Federation of Fishermen's Associations, Institute for Fisheries Resources , Center for Biological Diversity, California Trout, Friends of the River, Environmental Law Foundation, Friends of Trinity River, The Butte Environmental Council, California Associations of Tribal Governments, Northern California Council of the Federation of Fly Fishers, The Sierra Fund, California Tribal Business Alliance, Environmental Justice Coalition for Water, American Whitewater, Klamath-Siskiyou Wildlands Center, Environmental Protection Information Center, Northcoast Environmental Center, Rogue Riverkeeper, and California Sportfishing Protection Alliance.

Sincerely,

S. Craig Tucker, Ph.D.
Klamath Coordinator
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I. BACKGROUND

California's native fish and wildlife populations are in steep decline and the majority of the state's waterways are suffering from poor water quality. The factors contributing to these declines are varied and range from activities such as urban development, irresponsible resource extraction practices, agricultural operations, global warming, and more.

Declines in fish and wildlife populations and impairments to water quality have a broad range of negative impacts to Californians' quality of life. For example, all Californians are dependant on naturally clean waterways for fisheries, recreation, and affordable drinking water. For others, declines in commercially valuable fish stocks have led to fisheries closures and concomitant losses in jobs and associated economic hardships. For others, the loss of a particular species of plant or animal and degradation of water quality in specific waterways affect religious and spiritual practices or otherwise affect cultural traditions. The latter is particularly true of California's Indigenous Tribes.

Indeed, many activities contribute to the aforementioned negative impacts to the environment, economy, and culture of Californians for many diverse walks of life. Many local, state, and federal laws are designed to evaluate many of these factors individually and establish rules and regulations as appropriate.

The current process governing the revision of rules regulating suction dredge mining dates back to a 2005 complaint filed by the Karuk Tribe against the Department. The Department's failure to act on a court order to revise suction dredge rules pursuant to CEQA and applicable provisions of the Fish and Game Code in a timely manner led the Karuk Tribe to collaborate with others including the Pacific Coast Federation of Fishermen's Associations, Klamath Riverkeeper, the Sierra Fund, Friends of the North Fork, Friends of the River, California Trout, the California Tribal Business Alliance and more to support legislation resulting in a statewide moratorium on suction dredge mining until the court order was fulfilled (SB 670, Wiggins).

II. COMMENTS

COMMENT # 1: THE DEPARTMENT MUST ASSURE THAT AN APPROPRIATE CEQA ANALYSIS OCCURS WHEN ISSUING PERMITS

Reasoning

The stated intent of the Initial Study is to develop suction dredge mining regulations that comply with the 2006 Order and Consent Judgment (*Karuk Tribe v. California Department of Fish and Game,* Alameda Superior Court, Case No. 05211597, dated December 20, 2006) and Fish and Game Code §§5653(b) and 5653.9. The commenters unequivocally contend that compliance with Fish and Game Code §§5653, 5653.9 and CEQA require two discretionary acts: (1) the adoption of regulations that comply with CEQA and the APA, and (2) a determination upon the issuance of each permit that the permitted activity will not cause deleterious impacts to fish.

In addition to amending the regulations for the suction dredge mining program pursuant to Fish and Game Code sections 5653 and 5653.9, the Department must assure that the future issuance of suction dredge permits complies with individual CEQA review. The SEIR and regulations must be explicit in requiring CEQA review for each individual permit issued under the new regulations for the suction dredge mining program.

As recognized by the legislature and the courts, each individual permit issued by the Department is subject to independent CEQA review and must be analyzed independently due to the unique circumstances that surround each permit. The Supreme Court has repeatedly held that CEQA must be interpreted to "afford the fullest possible protection to the environment.[1]" In order to carry out that objective CEQA applies to all "discretionary projects proposed to be carried out or approved by public agencies.[2]"

The issuance of individual suction dredge permits constitutes a project requiring review under CEQA. "CEQA defines a 'project' extremely broadly.[3]" The issuance of a permit by the Department to conduct mining operations in jurisdictional waterways that results in potentially significant environmental impacts falls within CEQA's statutory purview. Importantly, the legislature has specifically recognized that individual suction dredge permits are subject to CEQA.[4]

The Department's issuance of a suction dredge permit is a discretionary act. A discretionary action is one that "requires the exercise of judgment or deliberation" on the part of a public agency in deciding whether "to approve or disapprove a particular activity."[5] In determining whether to issue a suction dredge mining permit the Department must make an individual determination on permit applications that "the operation will not be deleterious to fish."[6] In ruling on the Department's decision making under Fish and Game Code § 5653, the Alameda County Superior Court found:

> "...that issuance of a suction dredge permit without a discretionary determination that the operation proposed by the license applicant is not deleterious to fish is a direct violation of the duty imposed on the DFG."[7]

Thus, each permit requires the Department's discretion. This requirement is independent from the requirement to issue regulations under Fish and Game Code § 5653.9 and assures that the regulations implementing the program comply with CEQA.

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[1] *Wildlife Alive v. Chickering*, 18 Cal. 3d 190, 206 (1976)

[2] Pub. Res. Code § 21080(a).

[3] *Azusa Land Reclamation Co. v. State of California*, 52 Cal. App 3d 415, 434 (1988).

[4] Fish and Game Code § 5653.1(a), "The issuance of permits to operate vacuum or suction dredge equipment is a project pursuant to the California Environmental Quality Act."

[5] CEQA Guidelines § 15357.

[6] Fish and Game Code § 5653(b).

[7] Order Granting Plaintiff's Preliminary Injunction, *Hillman v. Department of Fish and Game*, Alameda County Superior Court, Case No. 09434444 at 10 (July 10, 2009).

The courts have further determined that the issuance of individual suction dredge permits is an independent discretionary project triggering CEQA. Looking specifically at whether the Department was violating CEQA in issuing suction dredge permits the Honorable Frank Roesch found that:

> "...each permit granted by the DFG involves a discretionary approval triggering a CEQA review. The DFG must exercise its discretion each time it issues a suction dredge permit"[7]

Moreover, the unique factual circumstances of each suction dredge mining application and permit require an independent review of the environmental effects of issuing the permit. Each permit constitutes a different set of site specific conditions involving, but not limited to, differences in ecology, biology, hydrology, water quality, and geology. The range of suction dredges with varying levels of impacts requires a unique analysis of each dredge's potential to cause environmental impacts.[8] Also, the extent, duration, and variability of the suction dredge activity will vary by permit and individual and must be considered. A weekend miner, who only deploys his dredge over a limited time period, will have a different impact than a full-time miner who runs a dredge over a long period.

Within this complex factual environment the Department must make an individualized showing that the permit will not have deleterious effects on fish.[9] As the legislature and courts have made clear this determination must be made in concert with the CEQA process for each permit.

Recommendation

The Amended Regulations and EIR must make clear that each individual permit is subject to separate CEQA review in order to analyze the potentially significant impacts o the Department's issuance of a permit and to assure that "the operation will not be deleterious to fish."

COMMENT # 2: THE SCOPE OF THE REVIEW SHOULD FOCUS ON WHICH RIVER SEGMENTS THE DEPARTMENT CAN AFFIRMATIVELY PROVE THAT ANY SUCTION DREDGE MINING WILL NOT CAUSE DELETERIOUS IMPACTS TO FISH.

Reasoning

As stated above, the Commenters contend that the Department must review each individual permit to determine that the permit applicant's suction dredge mining operation will not cause deleterious impacts to fish. However, from the Department's description of its obligations in the Initial Study, it appears the Department is taking the position that the adoption of new regulations is the only discretionary act required under the Fish and Game Code and CEQA.

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[8] Initial Study, pps 12-16.

[9] Fish and Game Code § 5653(b).

While the Commenters do not sanction the Department's interpretation of its duties, we suggest the following alternative approach because we believe it could provide an equivalent level of protection to California's rivers and wildlife that was intended when the Legislature amended the Fish and Game suction dredge mining statutes in the early 1990s.

Commenters believe that the permitting program should be limited to include only those rivers in which the Department can affirmatively prove that no deleterious impacts will occur to fish. This position is consistent with the baseline established by the Department for the review; specifically that it "is one that assumes no suction dredging in California."[10] Commenters are pleased that the Department adopted this baseline and agree that it is appropriate.

Under the approach, a river segment would not be allowed to be dredged if, after the Department considers the body of literature and any other evidence, it finds either: (1) that suction dredge mining would result in negative impacts to fish and their habitat, (2) the evidence fails to conclusively determine that no negative impacts would occur, yet suggests such impacts are likely or possible; or (3) there simply is a lack of evidence or other data regarding a particular river segment.

The Department would not be allowed to make a determination that suction dredge mining would be allowed on large sections of rivers, particularly where no studies have been conducted or no other evidence exists to definitively establish a no deleterious impact result.

Recommendation:

As an initial matter, Commenters believe the following rivers should be excluded from the suction dredge mining program because dredging is particularly likely to result in deleterious effects:

1. All river segments with historical gold mining activities in which mercury was utilized;

2. River segments listed as impaired under 303(d) of the Clean Water Act due to turbidity, water temperature, sediment, or mercury;

3. All river or stream segments designated as components of the National Wild and Scenic Rivers System or deemed eligible for protection by federal agencies. Federal rivers are to be managed to protect their specific outstandingly remarkable scenic, recreation, historical/cultural, fish/wildlife, ecological, geological, and other values. In addition, water quality on federally protected rivers must meet or exceed federal criteria or federally approved state standards for aesthetics, fish and wildlife propagation, and primary contact recreation[11]

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[10] Initial Study, p. 22.

[11] Public Resources Code, Chapter 1.4 (commencing with Section 5093.50) of Division 5.

(Commenters note that the Initial Study contains an incomplete list of State and Federal Wild and Scenic Rivers on page 7);

4. All rivers protected pursuant to provisions of the California Wild and Scenic Rivers Act (Chapter 1.4 (commencing with Section 5093.50) of Division 5 of the Public Resources Code). DFG has a responsibility in its permitting process to protect the free flowing character and extraordinary values of state designated rivers;[12]

5. All river or stream segments designated by the Fish and Game Commission as Wild Trout Waters or Heritage Trout Waters, or deemed suitable for designation pursuant to Section 1727 of the Fish and Game Code;

6. All river segments that provide critical, potential, and historical habitat for federally or state listed threatened species or endangered species, "Special Animals" (e.g. species at risk, special status species, species of special concern) and candidate/proposed species;

7. Rivers in Key Watersheds as identified by the Northwest Forest Plan;

8. All stretches of rivers in which miners' off-river activities (hauling supplies, camping, taking dredges on or off river, refueling, emptying sluices, sorting concentrates, etc.) will likely cause negative impacts to the immediate environment because it results in activities such as trampling of sensitive or culturally significant plants, fuel spillages, or handling of hazardous materials.

In addition, the Department's regulations must clearly state that the Department has the right to revoke, suspend, or refuse to be renew a permit should it discovery evidence showing that deleterious impacts will occur to fish.

Lastly, since the CEQA review includes a review of water quality issues (and, particularly because the State Water Board is likely to use the findings for its own permitting program), Commenters believe that the Department should conduct an anti-degradation analysis. This would require a river-by-river analysis of the baseline water quality, a study of the impacts from suction dredge mining, and the requisite analysis to determine whether any degradation will occur to water quality from suction dredging activity. If the answer is in the affirmative, suction dredge mining cannot be allowed. The point of this analysis is determine *beforehand* whether suction dredging in a particular area will degrade water quality – rather than have it occur and try to fix it later. (*See, also,* Comments #4 and #5 below.)

COMMENT # 3: THE INITIAL PLAN FAILS TO DESCRIBE HOW THE DEPARTMENT WILL LIMIT THE SUCTION DREDGE PROGRAM BASED ON FINANCIAL CONSTRAINTS ON ENFORCEMENT AND MANAGEMENT

Reasoning

[12] Public Resources Code Section 5093.61.

The Department should limit the scope of its suction dredge program on the basis of what its finances allow under the current fee structure. In other words, it should limit the program to what it can honestly and pragmatically enforce and manage. If the Department only has the means to monitor the impacts of suction dredge mining on a limited number of river segments and streams throughout the state, then it must limit the river segments and streams in which it allows suction dredge mining to occur. This is the only approach allowable in order for the Department to be able to conclude that each operation will not cause deleterious impacts to fish.

Recommendation

The SEIR should provide an economic analysis and policy proposal based on what river segments the Department can afford to adequately manage and enforce regulations.

COMMENT #4: THE EIR MUST COMPLY WITH THE DEPARTMENT'S DUTY UNDER CEQA TO INFORM THE PUBLIC OF HOW THE REVIEW WILL NOT CONFLICT WITH EXISTING LAWS AND THE FACILITATION OF OTHER PERMITTING PROGRAMS

Reasoning

The EIR must fully disclose and analyze the Project's potential conflicts with existing laws and regulatory programs. An EIR is required to be an informational document from which the public can properly weigh any adverse effects presented by a project.[13] .In conducting this analysis, the agency "must use its best efforts to find out and disclose all that it reasonably can" and cannot simply hide behind its failure to gather and analyze the necessary information.[14]

Recommendation

A key component of the informational requirements of CEQA is the full disclosure and analysis of conflicts with other environmental laws. Indeed, CEQA requires the EIR to analyze whether the Project will "[v]iolate any water quality standards or waste discharge requirements."[15] These standards promulgated under the Clean Water Act and administered by the State Water Quality Control Board are crucial for a determination of the Project's impacts on hydrology and water quality. To that end the EIR must analyze any potential conflicts with the achievement of Clean Water Act standards under §§ 303(d), 401, 402; the Porter-Cologne Act, and any other relevant provisions of applicable law such as the California Endangered Species Act and the national Endangered Species Act.

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[13] Pub. Res. Code §§ 21061; 21005(a) states that, "noncompliance with the information disclosure provisions of this division which precludes relevant information from being presented" violates CEQA.

[14] Guidelines § 15144.

[15] Appendix G § VIII, relied upon in the Initial Study at p. 70.

COMMENT # 5: THE INITIAL STUDY IS NOT CLEAR AS TO WHAT LEGAL AUTHORITIES ARE APPLICABLE.

Reasoning

On page 4 of the Initial Study one stated program objective is to:
"Promulgate regulations as necessary that effectively implement Fish and Game Code section 5653 and 5653.9 and other applicable legal authorities."

The Commenters assert that "other applicable legal authorities" must include compliance with the Clean Water Act and any additional applicable laws typically enforced by the California State Water Resources Control Board (Water Board) such as the Porter-Cologne Act. According to the Water Board:

"The Water Boards are currently working with the CDFG to include water quality protection measures in its regulatory program."[16]

Furthermore, it is the understanding of the Commenters that this SEIR is partially funded by the State Water Quality Control Board so that the Board can use its findings to determine whether the resulting DFG regulations satisfy the various water quality statutes enforced by the Board.

In addition, the Program Objectives fail to reflect the Department's obligation to comply with Fish and Game Code Section 1600 regarding Streambed Alteration Agreements. As noted by the Friends of the North Fork, the Department's failure to require suction dredge permittees to comply with the state's Streambed Alteration Agreement statutes violates the courts' long-standing presumption against "implied repeals."[17] The courts have regularly and consistently stated that all laws on a similar subject must be given full force and effect, unless it is impossible to rationally do so. The state's laws regarding suction dredging and streambed alteration agreements are not so fundamentally incompatible that one must be preempted by the other.

Recommendation

The SEIR should specifically describe how the project will comply with the Clean Water Act and all rules and regulations of the Water Board as well as those of Cal EPA. These agencies should be listed as additional legal authorities for the purposes of this rule making process. In addition, Cal EPA should be added to the list of "Other Public Agencies whose Approval or Input May be needed."[18]

Furthermore, the program objectives should include compliance with Fish and Game Code Section 1600 regarding Streambed Alteration Agreements as well as the California Endangered Species Act and the national Endangered Species Act.

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[16] http://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/suctiondredge/2008_faq.pdf

[17] Letter to Department Director Ryan Brodderick from Friends of the North Fork, June 21, 2007.

[18] Initial Study, p. 28.

COMMENT # 6: DESCRIPTION OF UPDATED REGULATIONS DOES NOT ADEQUATELY EVALUATE THE FULL RANGE OF ACTIVITIES TO WHICH NEW REGULATIONS MAY APPLY.

Reasoning

The Initial Study provides a list of activities not considered suction dredging for purposes of the Proposed Program, as they are not subject to the Department's permitting authority under Fish and Game Code section 5653, subdivision (b). These activities include high banking outside of the existing water line; use of a suction dredge with its intake pipe removed but still using a pump to move water through the sluice box; and power sluicing for gold.[19]

The initial study adopts these existing exclusions with no consideration of the in-stream impact of these activities and with no analysis of whether or not these activities meet the definition of suction dredging as defined by Fish and Game Code Section 5653 or California Code of Regulations Section 228. Indeed, California Code of Regulations Section 228 states:

> *"For purposes of these regulations, suction dredging (also called vacuum dredging) is defined as the use of a suction system to remove and return material at the bottom of a stream, river, or lake for the extraction of minerals."*

The Commenters note that this definition does not define suction dredges as having gas or diesel powered vacuum pumps or motors or any particular type. Commenters therefore assert that many of the activities listed on page 5 of the Initial Study may meet this definition. After all, many of these activities involve sucking up the river bottom and there is nothing in the statute that justifies the narrow definition assumed in the Initial Study.

Nor does CCR 14 Section 228 define a suction dredge by specifying any particular type of pump technology or vacuum system design. The Initial Study, however, limits the definition of a suction dredge to those devices utilizing a vacuum hose operating through the Venturi effect. [20] The Initial Study's definition is erroneously inconsistent and narrower than that of Section 228's superseding definition. By requiring a Venturi jet in order to be considered a suction dredge pursuant to the regulations, the Department is creating an incentive to switch to a different type of pump jet to avoid regulation.

The SEIR must also fully disclose and analyze the reasonably foreseeable direct and indirect environmental effects of the activities associated with suction dredge mining. CEQA requires that the Department analyze "the whole of an action" directly undertaken, supported, or authorized by a public agency "which may cause either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment."[21] As noted above, and in the Initial Study at 17-20, there is a range of

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[19] Initial Study, pps. 6-7.

[20] Initial Study, p. 5.

[21] Pub. Res. Code § 21065; CEQA Guidelines § 15378(a).

reasonably foreseeable activities that result from suction dredge mining that have potentially significant environmental effects.

Recommendation

The SEIR should consider and evaluate the entire range of activities and technologies that meet the definition of suction dredging under California Code of Regulations Section 228 that should be governed by the new regulations. The SEIR must also fully disclose and analyze the reasonably foreseeable direct and indirect environmental effects of the activities associated with suction dredge mining.

COMMENT # 7: THE INITIAL STUDY INAPPROPRIATELY DEFINES "DELETERIOUS EFFECT."

Reasoning

The Initial Study defines 'deleterious effect' as follows:

> *"...the Department is guided by a common sense plain meaning of the word deleterious such that deleterious effect generally means a wide-ranging or long-lasting consequence for a fish population that extends beyond the temporal or special context of a specific direct impact. Such deleterious effects could include the following: (1) Catch, capture, kill, or injure a species listed as candidate, threatened or endangered under the state or federal Endangered Species Act; (2) A substantial reduction in the range of any species, and/or extirpation of a population; (3) A fundamental change to the structure of a community or stream ecosystem, including substantial reductions in biodiversity or resiliency to disturbance, resulting in the reasonably foreseeable consequence of (1) or (2) above."*[22]

Commenters contend that the Department's definition of "deleterious" is not based on 'common sense' as it purports. It should be noted that the statute does not define 'deleterious'. Therefore, basic cannons of statutory interpretation require the Department to adopt the common, lay definition – such as that found in the dictionary. The very high standard referenced in the Initial Study is not supported by the statute, case law, or common usage.

Webster's Dictionary defines deleterious as *harmful often in a subtle or unexpected way.*[23]

Recommendation

Adopt a definition for phrase 'deleterious effect' that is consistent with the legally acceptable definition of the word 'deleterious.'

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[22] Initial Study, pps. 7-8.

[23] http://www.merriam-webster.com/dictionary/deleterious

COMMENT # 8: DREDGING IMPACTS ON FISH'S ACCESS TO COLD WATER REFUGIAL AREAS JUSTIFIES A COMPLETE BAN ON DREDGING IN THESE AREAS

Reasoning

In many salmonid bearing streams, migrating fish, both out-migrating juveniles and returning adults, rely heavily on thermal refugia to survive. Thermal refugia are river zones characterized by water temperatures measurably lower than the main channel or surrounding area. The lower temperature of the refugial area results from inflow from a colder tributary or an underwater spring.

Given that these areas are of monumental importance for fish survival (both juveniles and adults), we urge a very thorough analysis and river by river identification of thermal refugia. For a recent evaluation of the importance of thermal refugia in the Klamath system and a brief preliminary analysis of dredging impacts of such areas, please see Chapter 4 of the North-coast Regional Water Quality Control Board's Staff *Report for the Klamath River Total Maximum Daily Loads (TMDLs) and Action Plan Addressing Temperature, Dissolved Oxygen, Nutrient, and Microcystin Impairments in California.*[24]

Recommendation

The SEIS should thoroughly characterize the location of thermal refugia in each river where dredging occurs and disallow dredge mining in these zones and adjacent buffer zones. Many thermal refugial areas and associated buffer zones have been documented in various Biological Opinions and TMDLs. This evaluation could be included in the section with the heading 'Effects from Habitat Alteration' on page 46 as well as 'Impacts on Juveniles and Adults' subheading 'Behavioral effects' page 41.

COMMENT # 9: THE HYDROLOGY AND WATER QUALITY SECTION FAILS TO ADEQUATELY ADDRESS THE MANY HAZARDS ASSOCIATED WITH MERCURY AND SUCTION DREDGE MINING

Reasoning

Under the Clean Water Act, states adopt water quality standards for their rivers, streams, lakes, and wetlands. These standards identify levels for pollutants, including mercury, which must be met in order to protect human health, fish, and wildlife. No person may discharge pollutants, including mercury, into waters unless the person has a permit.

The National Pollutant Discharge Elimination System (NPDES) is the permit system established by the Clean Water Act (CWA) to regulate direct wastewater discharges from wastewater treatment plants and industry. Wastewater dischargers may be required to comply with a specific mercury discharge limit (concentration and/or mass limit) or may only be required to monitor their discharges for mercury. Local discharge limits in California for mercury range from 0 to 0.1 ppm (or mg/l). The Total Maximum Daily Load is a calculation of the maximum amount of a pollutant that a water body can receive

[24] http://www.swrcb.ca.gov/northcoast/water_issues/programs/tmdls/klamath_river/, particularly Chapter 4.

and still meet water quality standards. TMDLs determine what level of pollutant load would be consistent with meeting water quality standards. The TMDL regulatory process also allocates acceptable loads among sources of the relevant pollutant.

A single recreational such dredge operating at 8 hours per days for 30 days disturbing 1-10sq/meters of stream bed in an area with a background concentration of mercury in the stream bed of 30ppb-1ppm would be responsible for mobilizing more mercury than the amount of mercury mobilized over the course of an entire year for an entire watershed. NPDES permits have not been given to recreational suction dredgers nor have TMDL's been developed for the waterways in which recreation suction dredging currently takes place in California. As such, recreational suction dredging in areas with mercury contamination is likely in violation of the Clean Water Act.

Recreational suction dredging exacerbates the existing mercury contamination problems in water bodies and increase the levels of mercury contamination in fish:

- **Recreational suction dredging takes place during the warm summer months of heightened biological activity**. Recreational suction dredges disturb and release mercury primarily in the summer months when the water is warm and the flows are low and there are an abundance of bacteria rich environments where mercury methylation is likely to occur. Once mercury gets into fish it can result in impaired water body listings or 303d listings, and fish consumption advisories. There are numerous fish consumption advisories for fish in mercury impaired water bodies in the Sierra as a result of mercury contamination. [25]

- **Floured mercury is released back into the water body.** The project description of recreational suction dredging acknowledges the fact that miners encounter mercury when operating dredges and begs the question about the mercury that is not captured by the dredge but is instead floured by the dredge and re-released back into the water-body in a form that is more likely to methylate and be incorporated into the food chain.[26] The floured mercury that is released back into the water body has been changed by the dredging activity and is considered more likely to methylate because as it travels through the intake hose, educator, and header box the mercury is disturbed and broken up into very small pieces. These small pieces, or floured mercury, are readily available to bacteria because it is small (high surface area to volume ratio), oxygenated and dispersed.

- **Mercury travels downstream.** The mercury that is not captured by the dredge but is instead discharged into the water-body travels downstream through any number of varied and divers habitats where it can be taken up by bacteria that live on the banks of the river and form floodplain wetland environments. The floodplain environment of upland rivers includes the entire 100 year floodplain because this is the area that gets inundated by storm events when the rivers swell and overtop the banks. It follows that, as long as the dredge is operating within

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[25] OEHHA, 2009 2009 Update of California Sport Fishing Advisories. http://oehha.ca.gov/fish/so_cal/index.html.

[26] Humphreys, R. 2005, RWQCB Staff Report, Mercury Losses and Recovery During a Suction Dredge Test in the South Fork of the American River.

the 100 year floodplain the dredge effluent that contains mercury is likely to contaminate the aquatic food chain. The literature review states that:

"Dissolved Hg, floured liquid Hg, and fine particle/colloid bound Hg may be transported long distances to environments favorable to methylation, e.g. wetlands, Yolo Bypass, or the Delta. It is well-known that methylation occurs in these environments."[27]

It is important to note that mercury may not need to travel long distances to be methylated, in fact methylation is likely to occur in the hyphoric zone, in backwater channels and as benthic exchange in many carbon rich low oxygen environments. The different environments, times of year and extent of mercury methylation has not been studied, nor has the effect of recreational suction dredging on methylation in these different environments occurred. Until the areas with the greatest mercury contamination and methylation potential are known it is prudent to not operate recreational suction dredges, otherwise the mercury contamination problem in California may worsen.

Recommendation: The effect of recreational suction dredging to water quality should be considered first and foremost among the impacts of the project. The impacts of disturbing and re-distributing mercury in the environment, on water quality, wildlife and human health and fish populations need to be fully analyzed in the SEIR.

COMMENT # 10: THE SEIR SHOULD PROPOSE A MANDATORY PROTOCOL FOR THE TRANSPORT, USE, AND DISPOSAL OF HAZARDOUS MATERIALS INCLUDING BUT NOT LIMITED TO MERCURY, NITRIC ACID, GASOLINE, AND DIESEL FUEL.

Reasoning

Page 19 of the Initial Plan describes the process by which gold can be extracted from ore using mercury and nitric acid. Additionally, the Initial Plan describes the need for miners to refuel mechanized dredges and change the oil.

All of the chemicals used in these activities are hazardous, some such as mercury, dramatically hazardous.

Recommendation

The SEIR should propose a mandatory protocol miners must adhere to when transporting, using, dispensing, or disposing toxic chemicals. The Commenters urge the Department to ban the use of mercury and nitric acid in mining camps and instead require that the extraction of gold from ore be done off site in a controlled environment.

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[27] Churchill, R. K. (2000). Contributions of Mercury to California's Environment from Mercury and Gold Mining Activities–Insights from the Historical Record. Extended abstracts for the U.S. EPA-sponsored meeting, Assessing and Managing Mercury from Historic and Current Mining.

COMMENT # 11: RULES REGULATING DREDGE MINING SHOULD CONSIDER RISKS TO MINERS' HEALTH WHEN DREDGING DURING TOXIC ALGAE BLOOMS

Reasoning

In water bodies throughout California, blooms of toxic blue green algae constitute a potent public health risk. In response to the threat, the California State Water Resources Control Board has organized a Blue Green Algae working group to develop guidelines and recommendations *"to provide guidance to local, state, and tribal regulators to protect people, pets, and livestock from the effects of toxic cyanobacteria in non-marine water bodies."*[28]

On the Klamath in particular, blooms of the blue green algae *Microcystis aeruginosa* has led to intensive monitoring for the algae and its associated toxin, microcystin. Microcystin is a potent liver toxin. According to the Blue Green Algae Working Group's Voluntary Guidance Document:

> *"Exposure to microcystins has the potential to cause acute and chronic injury, depending on the dose and duration of exposure. Sub-acute damage to the liver is likely to go unnoticed up to levels that are near severe acute damage (Chorus et al., 2000). Two aspects of chronic damage include progressive injury to the liver and tumor-promoting capacity. The International Agency for Research on Cancer found there was inadequate evidence for carcinogenicity of microcystin LR or Microcystis extracts (WHO, 2006). However like several other liver toxins, microcystins have been shown to promote liver tumors (Falconer & Buckley, 1989)."*[4]

Dredge miners spend hours in the Klamath and other rivers in the summer when algae blooms are at their peak and hours more in camp wearing damp wet suits. This means that as a user group, miners are extremely susceptible to the negative health affects of algal toxins.

Recommendation

In order to protect the health of miners, the Commenters urge the Department to evaluate the unique risks that toxic algae blooms pose to miners' health and consider steps to discourage or limit dredging when algal toxin concentrations exceed guidelines developed by the Blue Green Algae working group.

COMMENT # 12: THE SEIR SHOULD INCLUDE A SECTION ON ENVIRONMENTAL JUSTICE

Reasoning

[28] http://www.waterboards.ca.gov/water_issues/programs/bluegreen_algae/docs/bga_volguidance.pdf

Several California laws require that state agencies, and California EPA in particular, to consider how rules and regulations affect minority communities. These laws include SB 828, AB 1360, SB 89, and more.

Environmental justice (EJ) is defined in California law as *"the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws and policies."*[29]

Indeed, Public Resources Code sections 71110-71113 charges Cal/EPA with the mandate to conduct its programs, policies, and activities that substantially affect human health or the environment in a manner that ensures the fair treatment of people of all races, cultures, and income levels, including minority populations and low-income populations of the state.[30]

Commenters have already asserted that the California Water Board and Cal EPA should be included as legal authorities for the purposes of this rule making process due in large part to the intrinsic connection the practice of suction dredging has on water quality.

The Karuk Tribe has described the cultural beneficial uses of the Klamath River. These uses are described and documented in some detail in Chapter 2 of the North-coast Regional Water Quality Control Board's *Staff Report for the Klamath River Total Maximum Daily Loads (TMDLs) and Action Plan Addressing Temperature, Dissolved Oxygen, Nutrient, and Microcystin Impairments in California.*[31]

Recommendation

Commenters urge the Department to thoroughly describe the impacts suction dredging has on the cultural beneficial uses of the Klamath River as identified by the Karuk Tribe as well as the cultural beneficial uses identified by other Indian Tribes and affected communities in other watersheds. Note that these affected beneficial uses pertain not only to anadromous fish, but to mussels, various riparian plants, mollusks, and more. In general, the SEIR should fully evaluate whether the proposed actions are consistent with California's stated commit to the principles of environmental justice.

COMMENT # 13: PUBLIC MEETINGS SHOULD BE HELD IN AREAS THAT ENCOURAGE PARTICIPATION BY AFFECTED PARTIES THAT HAVE DIFFICULTY TRAVELLING LONG DISTANCES DUE TO ECONOMIC HARDSHIP

Reasoning

As noted previously, the Karuk Tribe is one of the key parties forcing a re-evaluation of suction dredge rules and the Tribe asserts that it is one of the parties suffering most from the adverse impacts of suction dredging. In addition, it should be recognized that Karuk

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[29] Government Code section 65040.12

[30] http://www.calepa.ca.gov/EnvJustice/Documents/2004/Strategy/Final.pdf

[31] http://www.swrcb.ca.gov/northcoast/water_issues/programs/tmdls/klamath_river/090619/Ch_2_PS_090619.pdf

Tribal members most reliant on the described cultural beneficial uses of the Klamath River experience poverty rates of 90%.[32]

The closest scoping meeting to Orleans, the town nearest the Karuk Tribe's dip net fishery, was in Redding California over 3 hours drive away and in the evening. This means that overnight accommodations were necessary in order to attend.

Recommendation

Hold a public comment meeting on the draft SEIS in Orleans in order to allow a relevant, but economically disadvantaged community to participate in the public process. Hold public meetings in coastal fishing communities such as Eureka to allow commercial fishing families to attend.

COMMENT # 14: THE ODOR EMITTED FROM SUCTION DREDGES SHOULD BE CONSIDERED A 'POTENTIALLY SIGNIFICANT IMPACT.'

Reasoning

One of the most common complaints Commenters receive from the local public regarding suction dredges concerns the odor and fumes emitted. In small rural river communities, summer means hot afternoons spent beside a favorite swimming hole. Nothing ruins the experience quite like the noise and fumes produced by a dredge. The Commenters assert that this is likely an experience shared by recreational river users statewide whether they are swimmers, boaters, or hikers.

For Tribes, many areas and river reaches utilized by dredge miners are also near prayer spots and ceremonial grounds. The fumes and noise generated by dredges therefore infringe on Tribal members' ability to freely and meaningfully engage in religious and cultural practices.

Recommendation

In the Air Quality section, page 34, consider 'create objectionable odors affecting a substantial number of people" to be a 'Potentially Significant Impact.'

COMMENT # 15: NOISE AND CHEMICAL IMPACTS TO JUVENILE SALMON SHOULD BE THOROUGLY EVALUATED

Rationale

The Initial Plan fails to include an evaluation of the impacts to juvenile salmonids by: (1) petroleum fuel spillage into the river from dredging engines; and (2) noise pollution from these engines and the impacts of this noise on the homing and tracking as well as predator avoidance and other survival traits of juvenile salmonids in the water near these in-river dredge operations. Noise alone, being a violent vibration of water in this case for long periods of time, can adversely affect the highly sensitive sound-receptive membranes of

[32] http://karuk.us/press/2005/Health%20Effects%20of%20Altered%20Diet.pdf (see page 36).

juvenile salmonids in many ways, potentially undermining their ability to hear and avoid predators and thus reducing their survival rates. Noise pollution and its disturbing influence on aquatic life generally is a factor that may represent a "potentially significant impact." Indeed, studies of fish response to loud underwater noises in the ocean show that noise can rupture these delicate auditory membranes, making the fish deaf to predators or the signaling from their own kind for mating. Similar deleterious affects could result from suction dredges.

Recommendation

The commenters believe that without any evidence to the contrary, suction dredge mining should not be allowed during times when juvenile salmonids are out-migrating. We note that the timing is different watershed to watershed and species to species. The scope of the EIR should include identifying all those time periods in which salmonids are likely to be present in those areas (as juveniles and spawning adults), and allowing suction dredge operations ONLY in those narrow time periods during which salmonids are least likely to be impacted due to not being present.

COMMENT # 15: A CONSIDERATION OF THE EFFECTS ON RIPARIAN HABITATS AND SENSITIVE NATURAL COMMUNITIES (PAGE 57) SHOULD THOROUGHLY CONSIDER IMPACTS TO PLANTS WITH CULTURAL AND MEDICINAL USES.

Reasoning

As noted earlier, the Karuk Tribe has provided to the Water Board a report on the cultural beneficial uses of the Klamath River and associated flora and fauna. Many plants found within the riparian zone of the Klamath River have value as basket materials or are used in traditional medicines. This is true for other watersheds and resident Tribes as well.

Recommendation

Consider the impacts suction dredging has on riparian zone plants that have been identified as having particular uses in basketry and traditional medicines.

COMMENT # 16: THE INITIAL PLAN FAILS TO ADEQUATELY ASSESS LOCAL TRAFFIC IMPACTS

Reasoning

In rural areas such as the Klamath River corridor, there are a limited number of pull outs and the shoulders of roads can be non-existent. In the summer, at the height of the tourist season, we observe groups of miners camped in these limited small pull outs along the road. The result is that locals are unable to find safe parking to access the river, and miners maneuver RV's with dredges in tow awkwardly in these turn outs which often are flanked by blind curves. The result is a dangerous traffic situation.

Recommendation

Consider under the section for Transportation/Traffic (page 87), that the project constitutes a 'Potentially Significant Impact' for subheadings (a), (d), (e), and (f).

COMMENT #17: THE INITIAL PLAN DOES NOT ADDRESS AESTHETIC IMPACTS AFTER DREDGING HAS OCCURRED

Reasoning

The Initial Study's identification of aesthetic impacts is limited to those impacts while suction dredge mining is actually taking place or while dredges are in rivers and streams. The study does not identify aesthetic impacts that exist *after* the mining activity has taken place. These include ropes and cables left attached to trees and rocks on the banks, abandoned mining equipment, trash such as discarded vacuum hoses, and the dredge holes and tailings piles in the river itself.

Recommendation

Analyze residual aesthetic impacts in the SEIR and issue regulations to reduce these impacts.

COMMENT #18: THE EFFECTS OF INCREASED TURBIDITY ON WATER TEMPERATURE ARE NOT CONSIDERED

Reasoning

Turbid water absorbs more solar radiation than clear water and, resultantly, reaches higher temperatures given the same amount of solar input. Increased turbidity can dramatically raise water temperatures on streams with relatively low flow. Suction dredge mining takes place primarily in summer during periods of the lowest annual flow on many rivers. It is reasonable to expect that increased turbidity from suction dredge mining may be artificially increasing water temperatures, negatively impacting fish that are already temperature stressed.

Recommendation

Analyze the impacts of increased turbidity on water temperature and subsequently on fisheries. Do not allow suction dredge mining on streams already experiencing temperatures stressful to fish or that are listed as temperature impaired pursuant to section 303(d) of the Clean Water Act.

COMMENT #19: CUMULATIVE IMPACTS OF THE PROGRAM MUST BE VERY THOROUGHLY EVALUATED AND CONSIDER EFFECTS OF RISING GOLD PRICES ON SUCTION DREDGING'S POPULARITY

Reasoning

The given impacts of a single dredge are multiplied when other dredges operate either concurrently or successively on a stream. The increasing price of gold is likely to result in an increase in the popularity of suction dredge mining as it did in the late 1970's and early 1980's[33]. Although the number of permitted suction dredges in the state has been relatively steady (around 3,200 annually), this must not be considered to necessarily indicate the future situation. An increased number of dredges operating on the state's rivers will magnify their cumulative impact.

Recommendation

Provide a thorough analysis of cumulative impacts through time and consider the likelihood of another spike in the popularity of suction dredging and its significance to cumulative impacts. Cap the number of dredges allowed on any given stream reach to reduce their cumulative impacts.

COMMENT # 20: THE INITIAL PLAN FAILS TO ADEQUATELY ASSESS THE IMPACT ON OTHER RECREATIONAL ACTIVITIES.

Reasoning

The environmental check list considers recreation impacts to be less than significant. It further states that since suction dredgers appear to be a "very small proportion" to total recreation use, the Proposed Program is not anticipated to impact recreational use or facilities. This reasoning ignores the fact that on some specific segments of the Klamath and East Fork San Gabriel Rivers (for example), suction dredging has become the primary use, dominating and creating significant conflict with other uses, and, in some cases, forcing other users out of the river segments.

Recommendation

Identify river and stream segments where the sheer density of suction dredging impacts and conflicts with other uses and adopt appropriate regulations to mitigate and reduce this impact to insignificant levels.

[33] Initial Study, p. 10.

KEENE ENGINEERING COMPANY INC.

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December 3, 2009

Dear Mark Stopher,

I would first like to say that I appreciate your unbiased views and hope we can work together with you and the department to get dredging open again.

As per our discussion at the Fresno scoping meeting about average yardages and capabilities of suction dredges. We have spent much time to give you realistic figures based on river conditions. These are good figures that we can all work with. I am sure if you check with any dredgers you will find that these formulas are true and correct. We made two different charts to represent both rocky type areas, such as the Yuba River and large gravel bars as found on the Klammath River. Please feel free to ca me if you have any questions.

Sincerely,

Patrick Keene

Keene Engineering

Dredge Study

Typical California type conditions. Such as River Gravel on the Klamath River

All test are based on a 1 to 1 flow ratio. Hose length not to exceed 20 feet or less material will be moved.

Dredge Size hose Diameter	Engine horse power	Water flow GPM through the Suction hose	Total water discharge through Sluice	Average % of solids in slurry	Gallons of solids per minute	Cubic feet of solids per minute	Cubic feet of solids per hour	Cubic yard of solids per hour
2 inch	2.5 hp	40	80	1.5	0.6	0.08	4.93	0.18
2.5 inch	3.5 hp	50	100	1.5	0.75	0.10	6.17	0.23
3 inch	4 hp	100	200	1.5	1.5	0.21	12.33	0.46
4 inch	6 hp	150	300	1.5	2.25	0.31	18.50	0.69
5 inch	9 hp	300	600	1.5	4.5	0.62	36.99	1.37
6 inch	14 hp	350	700	1.5	5.25	0.72	43.16	1.60
8 inch	46 hp	750	1500	1.5	11.25	1.54	92.48	3.43
10 inch	95 hp	1600	3200	1.5	24	3.29	197.28	7.31

Typical California type conditions. Such as dredging on the North fork of Yuba River

All test are based on a 1 to 1 flow ratio. Hose length not to exceed 20 feet or less material will be moved.

Dredge Size hose Diameter	Engine horse power	Water flow GPM through the Suction hose	Total water discharge through Sluice	Average % of solids in slurry	Gallons of solids per minute	Cubic feet of solids per minute	Cubic feet of solids per hour	Cubic yard of solids per hour
2 inch	2.5 hp	40	80	1	0.4	0.05	3.29	0.12
2.5 inch	3.5 hp	50	100	1	0.5	0.07	4.11	0.15
3 inch	4 hp	100	200	1	1	0.14	8.22	0.30
4 inch	6 hp	150	300	1	1.5	0.21	12.33	0.46
5 inch	9 hp	300	600	1	3	0.41	24.66	0.91
6 inch	14 hp	350	700	1	3.5	0.48	28.77	1.07
8 inch	46 hp	750	1500	1	7.5	1.03	61.65	2.28
10 inch	95 hp	1600	3200	1	16	2.19	131.52	4.87

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November 20, 2009

Mark Stopher
California Department of Fish and Game
601 Locust Street
Redding, CA 96001

RE: Suction Dredge SEIR Meeting in Klamath River Region & Extension of NOP Comment Period

We are writing to respectfully request that the California Department of Fish and Game hold a public meeting on the Notice of Preparation for the suction dredge Subsequent EIR in the Klamath River region. While we understand that the Department is obligated to hold only one such meeting and that three meetings have been held, it is a glaring oversight for a meeting to not be held on the Klamath.

As you know, the legal decisions that precipitated the development of the SEIR arose from suction dredge activities in the Klamath watershed. Perhaps more than anywhere else in the state, the current suction dredging issue and debate has originated on the Klamath River. We believe that this fact alone justifies the addition of a public meeting in this area.

Further, residents of the Klamath River region are more likely than most other Californians to have low incomes that preclude expensive travel to a faraway meeting in Redding at a time of day that would likely require an overnight stay. For example, Siskiyou County has 17.7% of residents below the poverty line, compared to 12.4% for the state as a whole. Unemployment rates in Siskiyou County are also disproportionately high. As such, holding a meeting only so close as Redding (a 3 hour drive from Happy Camp, CA) precludes participation by a segment of the population most affected by the issues under consideration in the SEIR and NOP. The environmental justice provisions of CEQA strongly suggest that a meeting in the Klamath area should be held. We suggest a meeting in Happy Camp or Orleans.

Due to the coincidence of the NOP scoping period with two federal holidays and Election Day, it makes common sense to extend the comment period beyond the current December 3 deadline. This will also help facilitate the addition of a meeting on the Klamath.

We appreciate your thoughtful consideration and response to these requests.

Sincerely,

Scott Harding

Scott Harding
Executive Director

From: Charles Wickman <crwickman@yahoo.com>
To: <dfgsuctiondredge@dfg.ca.gov>
Date: 12/3/2009 3:03 PM
Subject: Suction Dredge Program Comments
Attachments: DFG Comments_12-03-09.doc

Dear Mr. Stopher,

We appreciate your acceptance of our comments. If you have any questions please contact either myself or Will Harling. As an organization that works closely with a broad cross section of Klamath River stakeholders, and invests a significant amount of time and resources monitoring Klamath River fisheries and implementing restoration projects on the river, we are more than happy to assist where we can.

Sincerely,

Charles Wickman

Fisheries Program Coordinator
Mid Klamath Watershed Council
Orleans, CA
(530) 627-3202

Mid Klamath Watershed Council

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California Department of Fish and Game

Attn: Mark Stopher

Suction Dredge Program Comments

601 Locust Street

Redding, CA 96001

Introduction

Since 2001, the Mid Klamath Watershed Council (MKWC) has been working to restore the threatened Klamath River in Northern California, and the upslope habitats upon which the river depends.

The Klamath River and its tributaries, including the Salmon and Trinity rivers, have some of the largest remaining wild salmon runs in the lower 48 States and hold the promise of significant ecological improvement through restoration programs.

MKWC's programs in the Middle Klamath subbasin include Watershed Education, Invasive Weed Management, Monitoring, Riparian Restoration, Fire and Fuels, Water Conservation, Roads, Fisheries, and Native Plants.

We wish to thank the California Department of Fish and Game for the opportunity to submit written comments regarding suction dredge mining. Your request is seeking information regarding the scope and content of the SEIR and associated regulatory updates, including:

- Potential impacts of suction dredging
- Scope and range of alternatives
- Types or approaches to the regulatory updates
- Information regarding deleterious effects to fish, if any; and
- Types of activities to be regulated under the Department's suction dredge permit program

Background

In compliance with the court order issued in December 2006 as a result of a lawsuit brought against the California Department of Fish and Game by the Karuk Tribe of California (Karuk Tribe et al. v. California Department of Fish and Game, Superior Court of Alameda Case Number RG05211597), CDFG is currently preparing a subsequent environmental impact report (SEIR). As of the August 5th, 2009 passage of Senate Bill 670 all suction dredge activity in the state of California has been halted until CDFG completes the further environmental review mandated under the 2006 court order.

CDFG has already admitted additional restrictions will benefit and protect coho salmon, steelhead, green sturgeon and lamprey. "The Department believes suction dredge mining under the existing regulations in the Klamath, Scott and Salmon River watersheds is resulting in deleterious impacts on coho salmon (*Oncorhaynchus kisutch*), a species currently protected by the California Endangered Species Act ("CESA") (Fish and G. Code, § 2050 et seq.). (See Cal. Code Regs., tit. 14, § 670.5, subd. (b)(2)(E).) Because of this, the Department also believes its current suction dredge permitting program is not in compliance with California Fish and Game Code section 5653, subdivision (b), and section 5653.9." (Declaration of Banky E. Curtis CDFG Deputy Director of Regional Operations Case # 05211597 10/17/06).

Comment #1

- The State's 1994 final environmental impact report titled Adoption of Regulations for Suction Dredging is outdated.

Reasoning

A 1998 report by US Forest Service researchers, Dr. Bret Harvey and Dr. Tom Lisle, reviews the effects of suction dredging and gives an evaluation strategy. The report recommends a careful analysis of watersheds where suction dredging is being permitted such as the Klamath River and its tributaries. The 1998 report states "We recommend that managers carefully analyze each watershed so regulations can be tailored to particular issues and effects" (Harvey and Lisle 1998). The report supports our recommendations for updated suction dredging regulations which incorporate new information. Considering the uncertainty surrounding dredging effects, declines in many aquatic animal populations, and increasing public scrutiny of management decisions, the cost of assuming that human activities such as dredging cause no harm deserves strong consideration by decision makers (Mapstone 1995). Where threatened or endangered species exist, managers would be prudent to assume activities such as dredging are harmful unless proven otherwise (Dayton 1998). The impacts of suction dredging vary according to size of water body, fish species present, season of dredging, frequency and intensity of dredging. Cumulative impacts can result from small-scale mining in the same location for multiple years or from multiple mining operations occurring within an area (Washington Dept. of Fish and Wildlife Small Scale Mineral Prospecting White Paper Dec. 2006)

Recommendations
New information including scientific reports and studies should be incorporated into the Environmental Impact Report (EIR). An updated EIR should be concurrent with State and Federal Laws and Policies.

Comment #2

- The State does not protect State and Federal ESA listed species, and Species of Special Concern.

Reasoning
The risk of aquatic species becoming extinct has increased due to degraded habitat conditions. Distinct populations of Klamath River fish including, salmon, sturgeon and lamprey are at risk of extinction, while the 1994 EIR does not provide special protection for these at risk species.

Protection needs of Coho salmon were elevated due to the 1997 Federal ESA and 2003 State ESA listing of the Northern California Southern Oregon Coho Salmon ESU (NAS Report 2003 report pg 216). Coho Salmon were not listed as endangered or threatened under the states CESA or the federal ESA when the 1994 EIR was released. Other fish in the Klamath River have been petitioned to be listed since the 1994 EIR. They include green sturgeon, pacific lamprey and Klamath Mountain Province steelhead trout.

Dr. Peter B. Moyle has stated. "All anadromous fishes in the Klamath basin should be considered to be in decline and ultimately threatened with extirpation as wild populations because of the long history of decline and the multiple threats to the river system. Suction dredging, through a combination of disturbances of resident fish, alteration of substrates, and indirect effects of heavy human uses of small areas, especially thermal refugia, will further contribute to the decline of the fishes." (Declaration of Dr. Peter Moyle Case # 05211597 01/26/06)

The State Biological Opinion (SBO) in Appendix I of the 1994 EIR describes listed fish species and actions taken to protect those species. Specific reasons for actions, such as dredging closures were given for each listed species. Winter-run Chinook salmon in the Sacramento and San Joaquin River are listed as a State Endangered and Federal Threatened species and thus the entire geographic range of the species in those rivers are closed to suction dredging. Reasons for the closure are given on page 129 and 130 of the 1994 EIR. The same reasons for closure should apply equally to the Klamath River and all steams with ESA listed species.

Expert briefs from British Columbia, Canada court cases provide expert testimony regarding effects of suction dredging (Expert Brief of F.N. Leone Canada Dept. of Fisheries and Oceans Prince George, British Columbia 01/14/07 and Expert Brief of L.B. Mac Donald Canada Dept. of Fisheries and Oceans Prince George, British Columbia 09/22/98). The testimony states numerous direct and indirect effects on fish from suction dredging actions. The testimony concluded direct effects of sediment discharge from dredging operations can cause low fitness levels in fish making them more susceptible to disease. Furthermore, dredging sediments discharged can cause tissue damage to fish thereby increasing susceptibility to disease. In recent years fish disease levels in the Klamath River have reached epidemic type levels. According to U.S. Fish and Wildlife reports from 2004-2006, as much as 90 percent of the juvenile Chinook out-migrant fish were infected by lethal disease pathogens during spring and summer months (Nichols and Foott 2007, Nichols and Foott 2006, Foott et al 2007).

We can assume that actions allowed by current suction dredge regulations increase stress to fish therefore increasing susceptibility to lethal disease outbreaks.

Recommendations
The 1997 Federal ESA Coho listing and 2003 State ESA Coho listings have elevated the protection status of Coho salmon. A new "Biological Opinion" should be incorporated into a new updated EIR which ensures protection of ESA listed Coho.

Comment #3

- Cumulative impacts from suction dredging concurrent with other watershed degradations.

Reasoning
Current and historic anthropogenic disturbances to the river system include; dam construction, mining, agriculture, timber extraction, urbanization and excessive fish harvest (2003 NAS, Kier Associates 1991). These human caused disturbances are blamed for rivers degradation and fisheries losses. The 2003 National Academy of Sciences (NAS) report titled Endangered and Threatened Fishes in the Klamath River Basin: Causes of decline and strategies for recovery describes the environmental conditions of the Klamath Basin and the challenges to fisheries. The report states, "The mainstem Klamath River has become a challenging environment for anadromous fishes because of decreased flows and increased summer water temperatures" (NAS Report 2003 pg 242). The NAS report strongly suggests Klamath Basin fish populations are under considerable stress because of historic and continuing human caused degradation to the river environment, including mining. Mining is referenced many times in this report as a major contributing factor to the decline of fish in the Klamath Basin. The report in Chapter 4 on the topic of current and historic conditions in reference to the Salmon River states "Historical and continuing placer mining has reduced riparian cover and disturbed spawning and holding sites within the basin" (2003 NAS Report pg 143). The report further states "If habitat degradation continues, the Klamath River and its main tributaries will probably favor non-anadromous native and nonnative fishes increasingly at the expense of anadromous fishes" (2003 NAS Report pg 242-243).

Fish kills affecting adult and juvenile salmon occurred in 2000 and 2002 in the Klamath River (CDFG 2000, Gullian 2003). Based on anecdotal information there have been many "fish kills" in the main-stem Klamath River during the 1990's (NMFS Biological Opinion 2002). The CDFG documented a large juvenile fish kill in the Klamath River during late June and into late July of 2000 where "tens of thousands" of juvenile salmon were estimated to have died in the river (CDFG 2000, NMFS Biological Opinion 2002). A major adult fish kill occurred during September of 2002 where an estimated 60,000+ fish died (in the most recent DFG report) (DFG Fish Kill Report 2003, Guillen, 2003, Yurok Tribe 2002 Fish Kill Report). Actions allowed by the 1994 EIR degrade water quality and increase stress to fish therefore potentially increasing susceptibility to lethal disease outbreaks.

Recommendations
We recommend that no suction dredging permits are issued within the Klamath River or any other stream until cumulative impacts of suction dredging are fully assessed and understood. Furthermore, impacts should be considered concurrently with other watershed impacts.

Comment #4

- The State provides no protection measures for habitats critical to fish for daily survival and seasonal reproduction.

Reasoning
Current regulations require a "seasonal closure" on many streams to protect spawning fish and incubating eggs. Under current 1994 EIR regulations in and around fish spawning habitats, these requirements do not provide adequate protection from degradation of the physical condition of the

spawning habitat and integrity during the incubation period. Excavation of gravels, wood and other debris during the dredging process causes channel destabilization and ultimately degrades spawning habitat (Harvey and Lisle 1998). Unstable channels where spawning occurs are more prone to bed scour and subsequent spawning redds scour, and egg mortality during winter storm freshets and other high water events that salmon redds routinely endure (Harvey and Lisle 1999).

Recent reports (see Harvey and Lisle 1998, Harvey and Lisle 1999 and Science Applications International Corporation, March 2004, USFS Technical Memo from the Washington Office 1995) suggest suction dredging causes negative impacts to spawning habitat and spawning success of salmon. Harvey and Lisle in their 1999 report state, "Our results show that fisheries managers should consider the potential negative effects of dredge tailings on spawning success of fall-spawning fishes such as Chinook salmon and Coho salmon *O. kisutuch*."

Thermal refugia sites in the Klamath River are characterized as cold-water areas created by coldwater tributary inflow, seeps, springs, upwelling and groundwater in an otherwise warm water channel (US BOR 2004). Fish congregate at thermal refugia areas to avoid otherwise lethal temperature conditions in the mainstem river during the summer months when water temperatures are typically high in the Klamath River. Cold-water areas associated with tributary mouths are documented and recognized in recent reports as being important habitats for salmon during the summer months in the Klamath River. Thermal refugia sites in the Klamath River are important areas where salmonids avoid lethal conditions during warm periods when fish are exposed to high water temperatures. Suction dredging near and in thermal refugia sites subjects fish to physiological stresses compounded by the existing poor water quality conditions.

Recommendations

On-the-ground biological assessment should be preformed by a DFG biologist or otherwise qualified fisheries biologist to identify spawning habitat types and recommend site-specific closures. In the Clearwater National Forest suction dredge operations are only allowed to be located in areas of large substrate not preferred for spawning steelhead trout and bull trout (Science Applications International Corporation. March 2004).

It is further recommended that habitats critical for daily survival, such as thermal refugia areas, are protected under any proposed regulations regarding habitat protection.

Comment #5

- The State provides no special protection measures for non-fish aquatic species or non-salmonid species.

Reasoning

Aquatic species such as fresh water mussels and other non- salmonid fish species are not protected and are being harmed under current suction dredging regulations. A recent study that occurred in Washington State suggests that considerable mortality could be occurring where suction dredge tailing are dumped on mussel colonies (Krueger 2007) Freshwater mussels form immobile beds or colonies. They are susceptible to smothering by sediments released from suction dredge tailings.

Furthermore, the 1994 EIR does not protect non-salmonid fish species including green sturgeon and pacific lamprey. Both species are benthic type fish and sensitive to benthic disturbance caused by suction dredging. In addition, Foothill Yellow-Legged Frogs are State Listed Species of Special Concern and were not evaluated during the 1994 EIR.

Recommendations

It is recommended that deleterious dredging effects on non-salmonid or other aquatic species be fully evaluated and understood, and that affected species be afforded appropriate protections.

Sincerely,

Will C.S. Harling

Will Harling, Executive Director
Mid Klamath Watershed Council

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Miners Alliance
P.O. Box 531 Big Bar Ca.96010
530-623-1623

Mark Stopher
California Department of Fish and Game
Redding, Ca.

Dear Sirs,

Our first response to the SEIR,

pg.2

Please bring forward the "new and substantially more severe environmental impacts" so that Miners Alliance may examine this evidence. The Program does not present any new biological evidence. It is hard to comment on a document that uses the words may, could ' can result, probably, is believed, suggests and likely to describe damages from suction dredge mining. .It would appear that only peoples opinions and not facts are generating the new EIR. From your own chart on pg. 10 we see that dredge mining since the 1994 EIR has declined a substantial amount. In other words the "impact" from dredges has decreased and that the impacts from dredges are less than substantial. The Army Corp of Engineers found dredge mining to be deminimus, the 1999 Roger, Marshall dredge study in Alaska found no accumulative effects from 8&10 inch dredges on the 40 mile river. The argument about the effects of dredge mining seems to be a philosophical argument between those who believe nothing should be allowed on public land and those who actually do something on public land, and don't forget to throw in fisherman who think the rivers are only for them!

pg.14&15

Please eliminate or correct the ludicrous claims for yardage moved by various sized dredges . These figures come from a manufacture trying to sell equipment to"newbees". Most dredges are equipped with lawn mower engines and could not move the yardage claimed in a year. All other assumptions in the "Program" are skewed by the erroneous suction yardage numbers shown in the chart. The alleged effects of dredging change dramatically when realistic yardage estimates are used.

pg. 22

Thresholds of Significance

If there was going to be any significant impacts from dredging they would already have happened in 1980 when there was 12000 dredges in the water almost all I might add were operating at the same time.

pg. 26

No meaningful exchanges between government and dredgers can happen when the public, that is dredgers, are limited to comments on cards.

pg. 30

It has been my observation and that of most anyone that I have talked to, that tourists love seeing gold dredges.

pg. 34

Dredging for the most part is done in remote areas where there is little or no smog requirements . All rivers in California and most streams have major highways right next to the water way. Every time it rains the pollutants from the thousands of vehicles that use the roads wash into the waterways . No amount of dredges could equal this. Greenhouse gas emissions reduction has to be done at the manufacturing level not in the private sector.

pg. 37

Biological Resources

This was hashed over in committee meetings with the DFG for 4 years. I was an ad hoc committee member. I see nothing new here with the exception of mercury. Although the finding of mercury is a rare occurrence on most waterways{having dredged for 25 years for a living and found mercury one time} dredgers do California a great service by removing it from the waterways. How do you plan on addressing the natural occurring mercury deposits. With the exception of drought years the gravel in steams move every year grinding up the gravel and the mercury, and at the same time creating new spawning gravel. Mercury does not need a dredge to disturb it, mother nature does it for us on a far greater scale than any dredge could ever do.

pg.61>

Some of the rest of the potential impacts if not included in the SEIR would be laughable . Dredging up human remains? Buried under water? I did not know that Indians could scuba dive. Shipwrecks- haven't seen to many of those. If a river system is " holistically considered for cultural values " why are 3 million fisherman allowed to litterbug and stomp the ground to death? Hazardous materials, what about the millions of cars using the roads right next to the waterways. Half of California was just burnt up by wildland fires and they were not caused by dredgers. If dredges

degrade water quality than mother nature should be arrested. Camping on the public lands is within the jurisdiction of the US Forest Service and the BLM. The States jurisdiction is on state lands. Once again mercury is removed by dredges. The amount lost by a dredge is very small and inconsequential compared to the mercury and gravel movement in a storm. In your own words "suction dredge activities involve temporary and minor amounts of human activities."

It has been estimated that suction dredging in California generates over 60 million dollars . You have taken my livelihood , I consider the loss of any job especially in a depression to be significant.

Miners Alliance puts tongue in cheek to suggest a definition of deleterious ; putting a hook in a fishes mouth and dragging it up on shore, and yes unlike may, could, or might affect the fisheries, that fish is dead. With commercial fishing, Indians, dams and recreational fisherman to the tune of three million it is hard to even find the effects of dredging. Fisherman the holy grail of the DFG kill millions of fish a year and add thousands of pounds of lead to the streams, something that has the potential to be way worse than mercury. Dredgers, for free, remove the lead and mercury and enhance potential spawning gravel by liberating the trapped sediment – to be washed away in the winter and spring.

Thank you,

Dan Morrison

Co Founder Miners Alliance

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December 3, 2009

BY FIRST CLASS MAIL AND E-MAIL (dfgsuctiondredge@dfg.ca.gov)

California Department of Fish and Game
Attn: Mark Stropher
Suction Dredge Program Comments
601 Locust Street
Redding, CA 96001

Re: *Suction Dredge Program Comments*

Dear Mr. Stropher:

Enclosed please find "Additional Comments of The New 49'ers, Inc." pertaining to the scope of the SEIR. We look forward to continuing to work with you to develop a sound CEQA document and environmentally-sound suction dredging program.

Sincerely,

James L. Buchal
Counsel to The New 49'ers, Inc.

ADDITIONAL COMMENTS OF THE NEW 49'ERS, INC.

The Fundamental Nature of the Document

The entire premise of the additional CEQA review, as established in the consent decree, was that "new information" had become available as to the significance of the ongoing activities. We strongly suggest that the proper focus of the SEIS should be to assess the significance of the "new information," not to start from scratch to re-do the 1994 FEIS.

As we have previously noted, we do not believe that any full-blown supplemental EIR is required at all, insofar as the listing of coho salmon species, while arguably "new information," is not associated with any real-world changes in environmental impact beyond those previously evaluated in 1994. Moreover, there is no additional "new information" of which we are aware meeting the standards in Guideline § 15162 to justify a supplemental EIR, as opposed to an addendum. In particular, we have yet to find evidence of any significant effects which were not discussed in the previous EIR, evidence of substantially more severe effects, or newly-available mitigation measures. To us, the NOP appears as if you have decided to re-evaluate all of the information which was already settled during the earlier EIR, rather than assess the impact of new data.

The 1994 FEIR provides ample consideration of the ongoing impacts of suction dredge mining under the existing regulations; the scope of the SEIS need only consider the "new information" since 1994, and the environmental impacts of any proposed changes to the regulations. As the California courts have explained, even a supplemental EIR is "not an occasion to revisit environmental concerns laid to rest in the original analysis". *Save our Neighborhood v. Lishman* (2006) 140 Cal. App.4th 1288, 45 Cal. Rptr.3d 306.

The presence of the existing FEIR distinguishes this case from cases such as *Azusa Land Reclamation Co. v. Main San Gabriel Basin Watermaster* (1997) 51 Cal. App.4th 1165, 61 Cal. Rptr.2d 447, in which the absence of an existing EIR provided a rationale for additional environmental analyses even for existing facilities.

We do not believe that the Superior Court and Legislative Assembly's actions with respect to suction dredge mining, arising by reason of the Department's failure to complete CEQA processes sooner, have any bearing on the appropriate scope of the environmental analysis required. (*Cf.* NOP at 21.) Rather, we believe that the Department needs to tightly focus this CEQA upon genuinely new information which was not previously considered in the 1994 EIR. A $60 million industry relies upon the foundations established in the 1994 EIR, which ought not to be disturbed absent any genuine reason to revisit environmental concerns which were exhaustively ventilated in the prior CEQA process.

Issues Concerning the Environmental Baseline

Section 15125 of the CEQA Guidelines sets forth the general rule that environmental conditions existing at the time environmental analysis is commenced "normally" constitute the baseline for purposes of determining whether an impact is significant. Indeed, pursuant to Public Resources Code § 21060.5, the "environment" means "the physical conditions which exist within the area which will be affected by a proposed project".

Here the Department proposes to adopt a "conservative" approach of using an environmental baseline which assumes no suction dredging in California. We believe this is inconsistent with the definition of the proposed project: "continued implementation of the permitting program, and, if necessary, proposed amendments to the Department's existing regulations . . .". (NOP at 2.) A proper baseline approach would assume continued dredging operations at recent permit issuance levels. From that baseline, the Department might appropriately assess impacts of any alternative from no further permits (not legally feasible) to substantial increases in the number of permits.

A large body of law supports the notion that in the context of ongoing and longstanding activities such as suction dredge mining, the baseline analysis should ordinarily evaluate the significance of incremental impacts of any changes in such activity that might result from project changes, *not* the significance of the baseline level of activity. *Cf., e.g., Lighthouse Field Beach Rescue v. City of Santa Cruz* (2005) 131 Cal. App.4th 1170, 31 Cal. Rptr.3d 901 ("the physical impacts of established levels of a particular use have been considered part of the existing environmental baseline"); *Fat v. County of Sacramento* (2002), 97 Cal. App.4th 11270, 119 Cal. Rptr.2d 402 (affirming negative declaration with baseline of existing airport usage); *Save our Peninsula Committee v. Monterey County Board of Supervisors* (2001), 87 Cal. App.4th 99, 104 Cal. Rptr.2d 326 (appropriate to use baseline of existing water usage); *Fairview Neighbors v. County of Ventura*, 70 Cal. App.4th 238, 82 Cal. Rptr.2d 436 (using baseline traffic impacts from "ongoing mining operation"); *Committee for a Progressive Gilroy v. State Water Resources Control Board* (1987) 192 Cal. App.3d 847, 237 Cal. Rptr. 723 (applying "existing facility" categorical exemption).

Where, as here, the question concerns review of a private activity conducted pursuant to private property rights, we believe it would be much more appropriate for the Department to consider the impacts of changes to the activity and new information, not to waste public resources through a "fresh look" from the beginning. For example, in *Bloom v. McGurk* (1994) 26 Cal. App.4th 1307, 31 Cal. Rptr.2d 914, the question concerned "ongoing operation of a medical waste treatment facility under a new regulatory scheme", and the Court of Appeals rejected attempts to nullify the applicability of a categorical exemption on the basis of the absence of prior environmental documentation.

The choice of an appropriate baseline recognizing ongoing dredging is especially important because the present environmental conditions include the proven positive impacts of suction dredge mining for many years under the existing regulations, and whatever adverse impacts are imagined to arise from many years of suction dredge mining under the existing regulations. Indeed, all or substantially all of the data available to the Department will consist of studies and evaluations of the environmental conditions under ongoing suction dredge mining.

In substance, the Department is proposing to adopt an artificial baseline as to which no real-world data concerning environmental conditions is available. But "[a]n EIR must focus on impacts to the existing environment, not hypothetical situations". *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal. App.4th 931, 91 Cal. Rptr.2d 66; *see also Riverwatch v. County of San Diego* (1999), 76 Cal. App.4th 1428, 91 Cal. Rptr.2d 322 (trial court "abused its discretion by requiring that the EIR account for prior illegal activity by using an early baseline from which impacts could be measured").

To the extent that the Department proposes to go forward by imagining a hypothetic set of non-existent physical conditions associated with "no dredging," it will be especially important to reconstruct those conditions inimical to the salmonid species that are a focal point of the SEIR, and the listing of which provided the legal predicate for the "new information" finding in the Consent Decree. In particular, the Department will be required to assemble historical data concerning the natural, concretized state of the Lower Salmon and other California rivers prior to years of suction dredging, during which time large stretches of the Klamath and other river systems in California contained little or not suitable spawning habitat for salmon species because of the concretized nature of the river bed.[1] The Department should also consider how hypothesized global climate changes would tend to reduce the hydraulic energy available for natural reconditioning of spawning beds, making the adverse impacts of the "no project" condition even more significant.

We do understand that the Guidelines (§ 15125(a)) refer to the physical conditions "at the time the notice of preparation is published"—here October 26, 2009. But the Guidelines also recognize that "[t]his environmental setting will *normally* constitute the baseline physical conditions by which a lead agency determines whether an impact is significant" (*id.*; emphasis added), affording discretion to use common sense to adopt a baseline appropriate to the circumstances. We believe it would be unreasonable for the Department to utilize an environmental baseline premised on a single instant in time, a time of year during which many California rivers and streams are closed to suction dredging. The Department has discretion to adopt a common sense approach based on consideration of baseline suction dredging activity during the dredging season. The

[1] The Department describes suction dredge mining's impact of loosening spawning gravel only in terms of a potential initial effect of creating unstable spawning areas. There is no empirical evidence whatsoever of any incremental risk of scouring from spawning in suction dredge mining tailings, and any instability from elevated piles (not attractive to the fish in any event), would vanish after the first year, leaving behind useful spawning habitat for many years. (*Cf.* NOP at 39.)

reasonable direction would be to use a baseline which reflects recent suction dredging activity supported by the regulations which are in question.

While we doubt the Department has enough discretion to attempt to re-create imaginary conditions absent ongoing suction dredging, the Department has not articulated, and cannot articulate, any explanation that would support such a deviation. The action of the Superior Court and Legislative Assembly to impose a temporary moratorium on suction dredge mining during the CEQA analysis was plainly not intended to affect the scope of that analysis by creating an entirely distinct environmental baseline. Moreover, the positive impacts of suction dredging will clearly persist through the moratorium, as it takes many years for stream beds to become "concretized" though sedimentation.

The Miners understand that the Department believes its "baseline" approach will provide a "'fresh look' at the impacts of suction dredge mining on the environment generally," but the Department is confusing the question of the environmental baseline with the scope of the project. The Department might properly include a "no project" alternative in the SEIR, but analyze the environmental impacts of such an alternative against the real, existing environmental baseline with ongoing suction dredging.

We are concerned that adoption of an improper baseline imagining no ongoing dredging may lead to improper findings of "significant effects," which may then require the Department to issue some statement of overriding considerations to outweigh such effects (Public Resources Code § 21081). The Department will have to make special efforts to support such overriding considerations, which will presumably include invaluable assistance to distressed rural economies, with substantial evidence in the record.

We note that the Department proposes to rely upon Appendix G guidelines for ascertaining significance, and note that Appendix G ascribes significance to the "loss of availability of a known mineral resource that would be of value to the region and the residents of the state." The Department should find that restrictions on suction dredging would give rise to such significant and adverse effect that should outweigh other, lesser factors. It is troubling to see that the Department has not identified "mineral resources" as among the environmental factors potentially affected by the project decisionmaking. (NOP at 28; *see also id.* at 78 (dismissing effects as "less than significant").) Insofar as there is a very wide range of permit issuance within the scope of the broadly defined "project"—presumably all the way down to no permit issuance—the effects of the loss of ability to mine the last commercially-significant deposits of placer gold cannot be dismissed as insignificant.

Issues Concerning "Deleterious Effect"

The Department correctly recognizes "the common sense meaning of the word deleterious such that deleterious effect generally means a wide-ranging or long-lasting consequence for a fish population that extends beyond the temporal or spatial context of a

specific direct impact". (NOP at 7.) Here, however, it is important to recognize that the project involves no specific direct impact on any fish species of any practical importance, with direct impacts only upon benthic invertebrates. The Department should reject the notion that a "deleterious impact" might involve any impact whatsoever upon species listed under the state or federal Endangered Species Act, insofar as those statutes merely impose a duty upon the State to avoid jeopardizing the continued existence of the listed species. Rather, the Department should require, consistent with regulatory guidance issued under those statutes, that "deleterious effects" mean an appreciable and negative impact on populations of listed species, similar to the language proposed for non-listed fish species: "a substantial reduction in the range of any species, and/or extirpation of a population". In focusing upon population-level effects, the Department should not address effects on units of protected species which are any smaller than the management units defined for purposes of the state or federal Endangered Species Act.

Issues Concerning Land Use and Planning

Other commentators have provided the Department with substantial information concerning the federal regulatory scheme for mining on federal land, which describes most suction dredge mining in California. The Appendix G Guidelines ask, among other things, whether the project would "conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project . . .". The present claim of no conflict with such regulations (NOP at 76) does not appear to take account of federal land management agencies and their mining regulations.

Scope of Literature Reviewed

We understand that the CEQA documents at this stage might necessarily contain more speculative, subjective and qualitative information, to be refined in the course of the study. However, in assessing the significance of asserted impacts, it will be important to have a *quantitative* sense of whether or not suction dredge mining has appreciable impacts on fish populations.

The U.S. Forest Service commissioned such as study, engaging Professor Peter B. Bayley, of the Department of Fish & Wildlife at Oregon State University, to conduct a comprehensive study to assess asserted cumulative impacts on fish populations in the Siskiyou National Forest. His Final Report was issued in April 2003, and represents the only scientific study of which we are presently aware that has attempted to *measure* the asserted cumulative impacts of suction dredge mining (as opposed to merely speculating about possible effects in a qualitative manner). He concluded:

> "Localized, short-term effects of suction dredge mining have been documented in a qualitative sense. However, on the scales occupied by fish populations such local disturbances would need a strong cumulative intensity of many operations to have a measurable effect. Local information reveals that most suction dredge miners adhere more or less to guidelines that have recently been formalized by the Forest Service and generally in . . . Oregon, but there are

individual cases where egregious mismanagement of the immediate environment has occurred, particularly with respect to damaging river banks in various ways. This analysis cannot account for individual transgressions, and a study to do so at the appropriate scale would be very expensive if feasible.

> *"Given that this analysis could not detect an effect averaged over good and bad miners and that a more powerful study would be very expensive, it would seem that public money would be better spent on encouraging compliance with current guidelines than on further study".*

This study corroborated the findings of numerous prior cumulative impact studies, all of which have previously been submitted to the Department in response to its October 2007 request for information. We trust that by the time the draft SEIR is issued, the Bayley study and other submitted materials will find their place above the more speculative references presently cited by the Department. *Cf., e.g.,* NOP at 95 (referencing "invertebrate productivity in subtropical black-water rivers"), 101 (fish behavior on "tropical reef").

Public lands for the People inc.
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Mark Stopher
California Department of Fish and Game
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Redding Ca. 96001

Nov. 16, 2009

Constructive Notice and Comment

(On California Department of Fish and Game (DFG) Notice of Preparation (NOP) for Suction Dredge Mining and Rule Making Process)

Public Lands for the People Inc. (PLP) and I appreciate the opportunity to participate in the rule making process for suction dredge mining in the state of California.

The purpose of our comments is to inform the DFG that in the process of doing their Environmental Impact Study (EIR) to promulgate Suction Dredge Regulations for the State of California, the DFG should seriously consider retaining an expert on Mining laws.

In the 1994 the DFG did not consider the ramifications of running afoul to the mining laws, the Constitutional protections, other applicable federal laws and the case law decisions on the rights of miners and mining claimants. If the DFG continues to ignore these laws in this present rule making process there will be serious ramifications in a court of law.

We have noticed that the DFG, NOP, on page 18 part 5.5.8 "Location", has apparently misinterpreted or does not understand the definition of what an exclusive right of a mining claim is or means, so we will address the correct meaning for the DFG.

"Many miners also own their own unpatented mining claims to which they have exclusive right only to the locatable minerals under there claim".

It is difficult to understand where the DFG got this particular description of exclusive "right **only** to the locatable minerals. Exclusive right of a mining claimant is all inclusive within the boundary's of the mining claim not just locatable minerals.

DISCUSSION: The Congress of the United States, as authorized by the Constitution, has the "exclusive" [1] power "...to dispose of and make all needful Rules and Regulations respecting the Territory or other Property belonging to the United States;" (Article IV).

In the Mining Acts of 1866 to 1872, the U.S. Congress, as authorized by the Constitution, declared [2], in the form of a "grant" [3], to the citizens of the United States, that;

> "... **the mineral lands of the public domain, both surveyed and unsurveyed, are hereby declared to be free and open to exploration and occupation by all citizens of the United States**, and those who have declared their intention to become citizens, subject to such regulations as may be prescribed by law, and subject also to the local custom or rules of miners in the several mining districts, so far as the same may not be in conflict with the laws of the United States." **(H.R. 365, 39TH CONGRESS, IN THE SENATE OF THE UNITED STATES, JULY 19, 1866, Sec. 1).** (emphasis added)

It is important to note that the only stipulations to the grant is that it is made "... subject to such regulations as may be prescribed by law..." and "...to the local custom or rules of miners...". In order to pursue the purpose of this examination (i.e.; to determine what rights, if any, are granted by the 1866-1872 Mining Acts), it is deemed advantageous to First determine what "... regulations as may be prescribed by law," the grant is or may be subject to.

We look to the United States Codes for the answer, in particular, 30 USC, Chpt. 2, Sec. 26, under the heading, "Locators' rights of possession and enjoyment"; where it clearly states:

> **"... so long as they comply with the laws of the United States**, and with State, territorial, and local regulations not in conflict with the laws of the United States **governing their possessory title...**" (emphasis added)

So here, in the U.S. Codes, we see that so long as the locators (miners and prospectors) comply with *"the laws of the United States..."*, and State, territorial, and local "regulations" (as long as they are not in conflict with the laws of the United States) "...**governing their possessory title...**" ... they qualify for and/or meet the

---

[1] **Exclusive.** Appertaining to the subject alone, not including, admitting, or pertaining to any others. Sole. **Shutting out; debarring from interference or participation; vested in one person alone.** (Black's Law Dictionary, 5th Edition, 1979) (emphasis added)

[2] **Declare. To make known, manifest, or clear.** To signify, to show in any manner either by words or acts. To solemnly assert a fact before witnesses. (Black's Law Dictionary, 5th Edition, 1979)

[3] **Grant.** To bestow; to confer upon someone other than the person or entity which makes the grant. Porto Rico Ry., Light & Power Co. v. Colom, C.C.A.puerto Rico, 106 F.2d 345, 354. To bestow or confer, with or without compensation, a gift or bestowal by one having control or authority over it, as of land or money. Palmer v. U.S. Civil Service Commission, D.C.Ill., 191 F.Supp. 495, 537.

stipulations of the grant. It is important to note – no, indeed, it is vital to note -- that the statutes do not even hint at or mention any other laws, rules, or regulations that the grantee is subject to; other than the local customs or rules of miners.

So just what are these "**laws of the United States, and with State, territorial, and local regulations**" that govern possessory title? These are the federal, state, and local laws, rules, and regulations that we all follow regarding the locating and keeping of a mining claim. In other words, the laws spelling out what must be done to have a valid Discovery and what information must be included in a "Notice of Location", "Affidavit of Labor", Quit-Claim Deed", and other similar documents; when such documents must be filed; what markers, if any, are required to mark the boundaries of the claim; and in some states, what taxes, if any, must be paid. It is important to note that there is no mention what-so-ever restricting mining methods, or for protecting the environment, for reclamation, or seeking approval from a land management agency and posting of a bond.

> A conveyance; i.e. transfer of title by deed or other instrument. Dearing v. Brush Creek Coal Co., 182 Tenn. 302, 186 S.W.2d 329, 331. Transfer of property real or personal by deed or writing. Commissioner of Internal Revenue v. Plestcheeff, C.C.A.9, 100 F.2d 62, 64, 65. **A generic term applicable to all transfers of real property, including transfers by operation of law as well as voluntary transfers.** White v. Rosenthal, 140 Cal.app. 184, 35 P.2d 154, 155. A technical term made use of in deeds of conveyance of lands to import a transfer. A deed for an incorporeal interest such as a reversion.
>
> **As distinguished from a mere license, a grant passes some estate or interest, corporeal or incorporeal, in the lands which it embraces.**

Now then; Section 26 (30 USC) goes on to say that as long as the locators of all mining locations comply with the laws of the United States, and with State, territorial, and local regulations not in conflict with the laws of the United States governing their possessory title that the locators of all mining locations on the public domain:

> **"...shall have the exclusive right of possession and enjoyment of all the surface included within the lines of their locations..." (emphasis added)**

Use of the word **"shall"** [4, 5] means *"must"* (or "does") have, in the highest order. Lesser direction would be something like "may", "might", etc.. In this usage, "shall" is an absolute, i.e.; the same as "must, in all cases and in all circumstances". And what "shall" the locator of a mining location have as long as they comply with the laws of the United States, and with State, territorial, and local regulations not in conflict with the laws of the United States governing their **possessory** title? Nothing short of "...**the exclusive right of possession and enjoyment of all the surface**...".

We've seen in footnote 1 that *"exclusive right"* means *"***Not including, admitting, or pertaining to any others. Sole. Shutting out; debarring from interference or participation; vested in one person alone.***"* (Black's Law Dictionary, 5th Edition, 1979) (emphasis added) As stated above, Congress, through the Constitution, has the "exclusive right" to "...**dispose of... the Territory or other Property belonging to the United States.**" No other branch of government has this authority. The miner's *"exclusive rights"* to possession and enjoyment of their mineral location is just as strong and binding as Congress's *"***exclusive right***"* to dispose of territory or other property belonging to the United States.

In other words, according to 30 USC, Chpt. 2, Sec. 26, as long as the locator of a mining location on the public domain complies with the laws and regulations governing the possessory title (to the location), then the locator *"***shall have the exclusive right of possession and enjoyment of all the surface...***"*. This can only mean one (1) thing; the language is simple. The law says **"exclusive right of possession and enjoyment***"*. This right can not be "exclusive" if it is in any way influenced or interfered with by any outside source, such as and including the various land management agencies. Indeed, any such restriction or regulation of bone fide mining operations makes a mockery of the term "exclusive". How can something be "exclusive" if it is shared or subject to outside control? It can't.

"...Exclusive right of possession and enjoyment of all the surface..."; that's what the law declares, and grants. How can the locator's "exclusive right of possession and enjoyment" be "exclusive" if it is secondary to the management of the U.S. Forest Service, the Bureau of Land Management, or other federal, state, and local governments?

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[4] **shall 3.** *(in laws, directives, etc.)* must; is or are obligated to... (Random House Webster's College Dictionary – 1991)

[5] **Shall.** As used in statutes, contracts, or the like, **this word is generally imperative or mandatory**. In common or ordinary parlance, and in its ordinary signification, the term "shall" is a word of command, and one which has always or which must be given a compulsory meaning; as denoting obligation. It has a peremptory meaning, and it is generally imperative or mandatory. **It has the invariable significance of excluding the idea of discretion**, and has the significance of operating to impose a duty which may be enforced, particularly if public policy is in favor of this meaning, or when addressed to public officials, or when public interest is involved, or where the public or persons have rights which ought to be exercised or enforced, unless a contrary intent appears. People v. O'Rourke, 124 Cal.App. 752, 13 P.2d 989, 992.

How can it be "exclusive" if it is secondary to the interests of fish, plants, bugs, and other critters? It can't. How can the locator's "exclusive right" to the *"enjoyment"* of all the surface be "exclusive" if the state can tell him when he can mine, how he can mine, or with what size equipment (or worse, that he can't mine). . . or if the Forest Service or BLM can restrict the methods of mining and even occupancy of the surface itself? All of these things (and dozens of others) totally and completely ignore the concept of **"exclusive rights"**.

Some may say that the use of the term *"**exclusive right**"* is a mistake... or that it doesn't really mean **"exclusive"**. However, a look at some of the other guarantees or rights granted in the Mining Acts of 1866 – 1872 may shed light on this subject.

INTENT: The intent of the Mining Laws and the continuing intent of Congress is simple and self-evident:

- **The general policy of the mining laws is to promote widespread development of mineral deposits and to afford mining opportunities to as many persons as possible**. (30 USC 22.50) (emphasis added)

and;

> The Congress declares that it is the continuing policy of the Federal Government in the national interest **to foster and encourage private enterprise in** (1) the development of economically sound and stable domestic mining, minerals, metal and mineral reclamation industries, (2) the orderly and economic development of domestic mineral resources, reserves, and reclamation of metals and minerals to help assure satisfaction of industrial, security and environmental needs... For the purpose of this Act 'minerals' shall include all minerals and mineral fuels including oil, gas, coal, oil shale and uranium. (Mining and Minerals Policy Act of 1970) (emphasis added)

RIGHTS TO EXCLUSIVE POSSESSION: Not only is the public domain already the land of whomsoever would desire to occupy the land (due to the grants of 1866 – 1872), which land is now held in trust [6] for him, but that the right of possession is exclusively his; to hold and enjoy. This possession is clearly guaranteed by the statutes:

- So long as the locator complies with statutory requirements and performs assessment work he is **entitled to hold his possession against all the world**, subject to the paramount sovereignty of

---

[6] **Trust.** A right of property, real or personal, held by one party for the benefit of another. King v. Richardson, C.C.A.N.C., 136 F.2d 849, 856, 857. A confidence reposed in one person, who is termed trustee, for the benefit of another, who is called the cestui que trust, respecting property which is held by the trustee for the benefit of the cestui que trust. State ex rel. Wirt v. Superior Court for Spokane County, 10 Wash.2d 362, 116 P.2d 752, 755. Any arrangement whereby property is transferred with intention that it be administered by trustee for another's benefit.

A fiduciary relation with respect to property, subjecting person by whom the property is held to equitable duties to deal with the property for the benefit of another person which arises as the result of a manifestation of an intention to create it. An obligation on a person arising out of confidence reposed in him to apply property faithfully and according to such confidence; as being in nature of deposition by which proprietor transfers to another property of subject intrusted, not that it should remain with him, but that it should be applied to certain uses for the benefit of third party. (Black's Law Dictionary, 5th Edition, 1979) (emphasis added)

The United States, and the legal title is held by the government **in trust for him**. (30 USC 28.36) (emphasis added)

and;

- By the terms of this section the locator of a mining claim has a possessory title thereto and **the right to the exclusive possession and enjoyment thereof, and this includes the right to work the claim, to extract the minerals therefrom, the right to the exclusive property in such mineral as well as the right to defend his possession**. (30 USC 22.70) (emphasis added)

NOTE: 30 USC 28.36 states that "...**the legal title is held by the government in trust for him.**" and that the definition in Blacks Law Dictionary for the term *"trust"* (see footnote 6), second paragraph reads:

> A fiduciary relation with respect to property, subjecting person by whom the property is held to equitable duties to deal with the property for the benefit of another person which arises as the result of a manifestation of an intention to create it. (emphasis added)

This means that the United States is acting as "trustee" in a *"fiduciary* [7] *relationship"* when they hold the legal title *"in trust"* for the locator (present or future) of a mineral location. And as the "trustee" of the Mineral Estate, the government is obligated and bound by both the law and the courts **"...to act primarily for another's benefit in matters connected with such undertaking." and "...to follow the terms of the trust and the requirements of applicable state law."** Or in other words, the government, as the trustee of the Mineral Estate, is obligated to place its primary importance in the benefit of the locator of a mineral location.

Furthermore, **"A breach of fiduciary responsibility would make the trustee liable to the beneficiaries for any damage caused by such breach."** (see footnote 7) (emphasis added)

So, as trustee of the Mineral Estate, the government is obligated to act primarily for the benefit of the locator of a mineral location, and a breach of this trust makes the trustee liable to the beneficiaries for any damage caused by such breach. As the statutes state, the locator of a mineral location shall have **the right to the exclusive possession and enjoyment** thereof, and this includes **the right to work the claim, to extract the minerals therefrom, the right to the exclusive property in such mineral as well as the right to defend his possession.** (30 USC 22.70) (emphasis added)

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[7] **Fiduciary.** The term is derived from the Roman law, and means (as a noun) a person holding the character of a trustee, or a character analogous to that of a trustee, in respect to the trust and confidence involved in it and the scrupulous good faith and candor which it requires. A person having duty, created by his undertaking, **to act primarily for another's benefit in matters connected with such undertaking**. As an adjective it means the nature of a trust; having the characteristics of a trust; analogous to a trust; relating to or founded upon a trust or confidence.

A person or institution who manages money or property for another and who must exercise a standard of care in such management activity imposed by law or contract; *e.g.* executor of estate; receiver in bankruptcy; trustee. A trustee, for example, possesses a fiduciary responsibility to the beneficiaries of the trust to follow the terms of the trust and the requirements of applicable state law. **A breach of fiduciary responsibility would make the trustee liable to the beneficiaries for any damage caused by such breach**. (Black's Law Dictionary, 5th Edition, 1979) (emphasis added)

In this light, it is plain that as the trustee of the Mineral Estate, the government is charged with making the protection of the "exclusive possession and enjoyment" of the location for the locator its primary duty and responsibility.

RIGHT TO SETTLE: The locator of a mining claim is viewed as a settler [8] in the land, and that he may do whatever he has need of which is conductive or incident to his mining effort. The Mining Acts, by provision, as well as by injunction, provides that any prudent man who would carry on any mineral extraction in the forests is regarded as a settler. A settler is one who comes on the land with the intent of settling and establishing himself on the land:

-
- 30 USC 26.91 – **The Rights** of one entering upon the public domain and locating and **working an mineral claim are as of the high order as those of a settler** each of whom is in possession under rights initiated which may be the observation of precedent conditions ripen into the right to a final patent. (emphasis added)

PROPERTY RIGHTS:

- Unpatented mining claims are "property" in the highest sense of such term, which may be bought, sold and conveyed and will pass by decent. (30 USC 26.94)

Notice is given

I hereby officially request DFG's unlawful actions cease and desist immediately. Failure to do so could subject the Director to personal suit for damages and those individuals acting in concert. The Director may also be subject to prosecution by the Dept. of Justice for Violations of the Hobbs Act (18 U.S.C. 1951), which states in part:

"(a) Whoever in any way or degree obstructs, delays, or affects commerce or the movement of any article or commodity in commerce, by robbery or extortion or attempts or conspires so to do, or commits or threatens physical violence to any person or property in furtherance of a plan or purpose to do anything in violation of this section shall be fined under this title or imprisoned not more than twenty years, or both.

(b) As used in this section--

(1) The term "robbery" means the unlawful taking or obtaining of personal property from the person or in the presence of another, against his will, by means of actual or threatened force, or violence, or fear of injury, immediate or future, to his person or property, or property in his custody or possession, or the person or property of a relative or member of his family or of anyone in his company at the time of the taking or obtaining.

(2) The term "extortion" means the obtaining of property from another, with his consent, induced by wrongful use of actual or threatened force, violence, or fear, or under color of official right." Emphasis added

Respectfully Submitted

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Nov. 17, 2009

Constructive Notice and Comment

(On California Department of Fish and Game (DFG) Notice of Preparation (NOP) for Suction Dredge Mining and Rule Making Process)

Public Lands for the People Inc. (PLP) and I appreciate the opportunity to participate in the rule making process for suction dredge mining in the state of California.

The purpose of our comments is to inform the DFG that in the process of doing their Environmental Impact Study (EIR) to promulgate Suction Dredge Regulations for the State of California, DFG should seriously consider retaining an expert on Mining laws.

In the 1994 the DFG did not consider the ramifications of running afoul to the mining laws, the Constitutional protections, other applicable federal laws or the case law decisions on the rights of miners and mining claimants. If the DFG continues to ignore these laws in this present rule making process there will be serious ramifications in a court of law.

We notice that the California Department of Fish and Game (DFG) in several places refer to the suction dredge community as recreational. Where ever the DFG gets such language from will most likely create a great problem down the line for them. There is no such creature, either in state law or federal law which creates a recreational suction dredger, prospector or miner and can only serve to take a miner out from under the protection of the rights granted under the mining law.

Recreation is a privilege in most cases and mining is a property right, a grant of land under the federal mining laws of 1866 and 1872. (30 USC 22 – 54). For the DFG to treat miners, prospectors or mining claim owners, (Mineral Estate Grantees) with the same disrespect as given to the recreational activities will certainly exceed DFG's regulatory authority.

Also it would appear that DFG believes they have discretion to regulate suction dredge mining to the point of prohibition. Case Law says that they can not prohibit prospecting or mining either temporarily or permanently.

In the Department of Fish and Game Notice of Preparation Document (DFG NOP) on page 21, last paragraph and I quote, **"In other words, the issuance of individual suction dredge mining permits consistent with regulations adopted by the Department under Fish and game Code section 5653.9 is an important aspect of the discretionary project being analyzed in the SEIR that the Department proposes to carry out and approve for the purposes of CEQA."**

In the Department of Fish and Game Notice of Preparation Document (DFG of NOP) on page 25, part 7.5, Final SEIR and Proposed Regulations, and I quote, **"The final SEIR, in turn inform the Department's exercise of discretion as a lead agency under CEQA in deciding whether to approve a the Proposed Program as prescribed by the Fish and Game Code."**

The DFG does not have discretion under CEQA or NEPA or any other state or federal law to prohibit suction dredge mining, temporarily or permanently, mining is not discretionary.

Definition of Discretionary **Blacks Law Dictionary 9th Edition**
(of an act or Duty) "involving an exercise of judgment and choice, not an implementation of hard-and-fast rule."

This language does not entertain the rights under the mining law but does offer an opportunity for the DFG to fall in an act of abuse of discretion.

Suction Dredge Mining nor any other form of modern day mining is discretionary and in the case of California's CEQA suction dredge mining is a ministerial action and can not be classified as discretionary. (CEQ Guidelines 15260 – 15285)

Definition of Ministerial **Blacks Law Dictionary 9th Edition**
"Of or relating to an act that involves obedience to instructions or laws instead of discretion, judgment, or skill…"

Discretionary is a Violation of Public Resources Code Section 21080-21098
21080. " (a) Except as otherwise provided in this division, **this division shall apply to discretionary projects proposed to be carried out or approved by public agencies**,

State law under CEQA also is defined as to only apply to discretionary projects as quoted from section 21080 of the Public Resource code:

Discretionary is a violation of CALIFORNIA CODES
PUBLIC RESOURCES CODE
SECTION 21080-**21098**
21080. (a) Except as otherwise provided in this division, **this division shall apply to discretionary projects proposed to be carried out or approved by public agencies…"**

The Federal code states at 50 CFR § 402.03 (Applicability)
"Section 7 and the requirements of this Part apply to all actions in which there is discretionary Federal involvement or control."

The U.S. Supreme Court in 2007 clarified the meaning of "discretionary agency action" in Home Builders v. Defenders of Wildlife 127 S.Ct. 2518 at 2534 where they stated:
" Agency discretion presumes that an agency can exercise "judgment" in connection with a particular action. See

; see also Random House Dictionary of the English Language 411 (unabridged ed.1967) ("discretion" defined as "the power or right to decide or act according to one's own judgment; freedom of judgment or choice"). As the mandatory language of § 402(b) itself illustrates, not every action authorized, funded, or carried out by a federal agency is a product of that agency's exercise of discretion.

This history of the regulation also supports the reading to which we defer today. As the dissent itself points out, the proposed version of initially stated that "Section 7 and the requirements of this Part apply to all actions in which there is Federal involvement or control," (emphasis added); the Secretary of the Interior modified this language to provide (as adopted in the Final Rule now at issue) that the statutory requirements apply to "all actions in which there is discretionary Federal involvement or control," (emphasis added). The dissent's reading would rob the word "discretionary" of any effect, and substitute the earlier, proposed version of the regulation for the text that was actually adopted.

In short, we read to mean what it says: that § 7(a)(2)'s no-jeopardy duty covers only discretionary agency actions and does not attach to actions (like the NPDES permitting transfer authorization) that an agency is required by statute to undertake once certain specified triggering events have occurred. This reading not only is reasonable, inasmuch as it gives effect to the ESA's provision, but also comports with the canon against implied repeals because it stays § 7(a)(2)'s mandate where it would effectively override otherwise mandatory statutory duties."

A miner operating under the Mining Law statute has a non-discretionary agency "advisory" relationship. A miner cannot be legally tortured into a CEQA, NEPA or ESA scenario. The law also, as the Supreme Court ruled, **"stays" the application of the ESA "where it would effectively override otherwise mandatory statutory duties"** like (for the purposes of this discussion) the Mining Law.

Violation of National Environmental Policy Act (NEPA)
Under "C Programmatic Analysis and Tiering", non-discretionary activities such as locatable minerals exploration, as well as pick and shovel work and suction dredging where T&E species exist, could be facilitated under programmatic analyses"
In 1994 the California Department of Fish and Game completed their EIR on suction dredging and determined that it was not deleterious to fish, in accordance with following the regulations as adopted. This should be sufficient until a new EIR is completed.

To illustrate this concept the Supreme Court has said:"A contract is a compact between two or more parties, and is either executory or executed. An executory contract is one in which a party binds himself to do, or not to do, a particular thing;...." "A contract executed is one in which the object [10 U.S. 87, 137] of contract is performed; and this, says Blackstone, differs in nothing from a grant...." **"A contract executed, as well as one which is executory, contains**

obligations binding on the parties. A grant, in its own nature, amounts to an extinguishment of the right of the grantor, and implies a contract not to reassert that right. A party is, therefore, always estopped by his own grant." Fletcher v. Peck, 10 U.S. 87 (1810)

The Public Lands cannot be "free and open" to exploration if the historical means of use by prospectors and miners can be prohibited by the State of California. The State of California may have the power to reasonably regulate activities not incident to mining upon the public lands, **but those same regulations fail when they operate to prohibit the customary usage by legitimate prospectors and miners on valid mining claims or in pursuit of such a claim.** These proposed statutory or regulatory amendments are prohibitive and not merely regulatory in fundamental character and, therefore, are unlawful as proposed. We call your attention to:

The DFG can not prohibit through regulation or using their discretion
Ventura County v. Gulf Oil Corporation, 601 F.2d 1090 (1979)
(2) Despite this extensive federal scheme reflecting concern for the local environment as well as development of the nations resources, Ventura demands a right of final approval. Ventura seeks to prohibit further activity by gulf until it secures and Open Space Use Permit which may maybe issued on whatever conditions Ventura determines appropriate, or which may never be issued at all. The federal Government has authorized a specific use of federal lands, and **Ventura cannot prohibit that use, either temporarily or permanently, in an attempt to substitute its judgment for that of Congress.**

Recreation is a privilege in most cases and mining is a property right, a grant of land under the federal mining laws of 1866 and 1872. (30 USC 22 – 54). For the DFG to treat miners, prospectors or mining claim owners, (Mineral Estate Grantees) with the same disrespect as given to the recreational activities will certainly exceed DFG's regulatory authority. It would appear that DFG believes they have discretion to regulate suction dredge mining to the point of prohibition. Case Law says that they can not prohibit prospecting or mining either temporarily or permantly.

Federal laws are always preeminent: once Congress passes laws that occupy an area, **no government at a lower tier, i.e., at the state or local level**, may pass laws that conflict with the federal laws.

As a miner operating under the U.S. Mining law (30 U.S.C. 22-54) **has a <u>non-discretionary</u> agency "advisory" relationship.** A miner cannot be legally tortured into a CEQA, NEPA, CWA, or ESA scenario. The law also, as the Supreme Court ruled, "stays" the application of the ESA "where it would effectively override otherwise mandatory statutory duties" like (for the purposes of this argument) the mining law. The mining law (Congressional grant) does not by its very nature admit to a permissive system (lease system), otherwise the mining law would be rendered meaningless. The California Department of Fish and Game (DFG) does not authorize mining (the mining law does), the DFG does not fund mining, and the DFG does not carry out the mining, therefore mining under the U.S. Mining law is not by definition a "federal action" subject to the CEQA, NEPA or CWA due to this fact that federal and state involvement or control is non-discretionary in fundamental character. (See also **<u>Karuk v. Forest Service</u>, Supra.)**

In U.S. v. Weiss 642 F.2d at 296:
"Although authority exists for the promulgation of regulations, those regulations may, nevertheless, be struck down when they do not operate to accomplish the statutory purpose or where they encroach upon other statutory rights."

Granite Rock v. US
"...**County ordinance is preempted because it conflicts with federal law.** Specifically, we address whether the ordinance conflicts with the Federal Mining Act because it stands as an obstacle to the accomplishment of the full purposes and objectives of Congress embodied in the Act. **Granite Rock,** 480 U.S. at 581, 107 S.Ct."

Dakota Mining Assoc. v. Lawrence County 155 F3d 1005 (8th Cir. 1998
Agency actions can often amount to prohibitions that impermissibly encroach upon the right to the use and enjoyment of placer claims for mining purposes (see 30 U.S.C 26). To reinforce this point, in **South Dakota Mining Assoc. v. Lawrence County** 155 F3d 1005 (8th Cir. 1998), at 1011 the court stated:
"...government cannot prohibit a lawful use of the sovereign's land that the superior sovereign itself permits and encourages. To do so offends both the Property Clause and the Supremacy Clause of the federal Constitution. The ordinance **is prohibitory, not regulatory, in its fundamental character.**"
Emphasis added.

30 U.S.C. 612(b)
so long as the agency regulatory authority over the miner does not become prohibitive. If the miner can work out a reasonable agreement, i.e. contract generally through an "informational", then all is well. If not, then the miner can complain to the surface management agency through written administrative complaint or the appeal process and assert that the agencies actions are unreasonable, material interfering, prohibitive, and why, pursuant to **30 U.S.C. 612(b)** (see **also U.S. v. Curtis-Nevada Mines** 611 F.2d 1277 at 1285).

Because environmental laws only apply in this setting. Namely the National Environmental Policy Act (NEPA-federal), the Endangered Species
The Court stated in Karuk v. Forest Service 379 F.Supp.2d 1071 at 1094 (N.D. Cal. 2005):

"...mining operations take place pursuant to the General Mining Law and the Surface Resources Act, which confers a statutory right upon miners to enter certain public lands for the purpose of mining and prospecting. This distinction is significant, as it differentiates mining operations from "licenses, contracts, leases, easements, rights-of-way, permits, or grants-in-aid," which are permissive in nature.

In fact, although Plaintiff vigorously argues that any act requiring "discretion" invokes the ESA, it is well-established that not every agency action triggers the consultation requirement of Section 7(a)(2) of the ESA. As the Ninth Circuit has made clear:

Within the limits prescribed by the Constitution, Congress undoubtedly has the power to regulate all conduct capable of harming protected species. However, Congress chose to apply section 7(a)(2) to federal relationships with private entities **only when the federal agency acts to authorize, fund, or carry out the relevant activity.**
Sierra Club v. Babbitt, 65 F.3d 1502, 1508 (9th Cir.1995) (emphasis added)."

And at 1095 the court stated:
. **Marbled Murrelet, 83 F.3d. at 1074**. Indeed, as the Ninth Circuit stated in Marbled Murrelet: Protection of endangered species would not be enhanced by a rule which would require a federal agency to perform the burdensome procedural tasks mandated by section 7 [of the ESA] simply because it advised or

consulted with a private party. Such a rule would be a disincentive for the agency to give such advice or consultation. Moreover, private parties who wanted advice on how to comply with the ESA would be loathe to contact the [agency] for fear *1103 of triggering burdensome bureaucratic procedures. As a result, desirable communication between private entities and federal agencies on how to comply with the ESA would be stifled, and protection of threatened and endangered species would suffer. Id. at 1074-75.

State law under CEQA also is defined as to only apply to discretionary projects as quoted from section 21080 of the Public Resource code:

CALIFORNIA CODES
PUBLIC RESOURCES CODE
SECTION 21080-21098

21080. (a) Except as otherwise provided in this division, this division shall apply to discretionary projects proposed to be carried out or approved by public agencies..."

Conclusion and Property Rights

Conclusion: The suction dredge miners and prospectors are not to be regulated under the discretion of any agency but only the non-discretionary or ministerial regulatory process.

- Unpatented mining claims are "property" in the highest sense of such term, which may be bought, sold and conveyed and will pass by decent. (30 USC 26.94)

Notice is given

I hereby officially request DFG's unlawful actions cease and desist immediately. Failure to do so could subject the Director to personal suit for damages and those individuals acting in concert. The Director may also be subject to prosecution by the Dept. of Justice for Violations of the Hobbs Act (18 U.S.C. 1951), which states in part:

"(a) Whoever in any way or degree obstructs, delays, or affects commerce or the movement of any article or commodity in commerce, by robbery or extortion or attempts or conspires so to do, or commits or threatens physical violence to any person or property in furtherance of a plan or purpose to do anything in violation of this section shall be fined under this title or imprisoned not more than twenty years, or both.

(b) As used in this section--

(1) The term "robbery" means the unlawful taking or obtaining of personal property from the person or in the presence of another, against his will, by means of actual or threatened force, or violence, or fear of injury, immediate or future, to his person or property, or property in his custody or possession, or the person or property of a relative or member of his family or of anyone in his company at the time of the taking or obtaining.

(2) The term "extortion" means the obtaining of property from another, with his consent, induced by wrongful use of actual or threatened force, violence, or fear, or under color of official right." Emphasis added

Respectfully Submitted

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Dec. 1, 2009

Constructive Notice and Comment
(On California Department of Fish and Game (DFG) Notice of Preparation (NOP) for Suction Dredge Mining and Rule Making Process)

Public Lands for the People Inc. (PLP) and I appreciate the opportunity to participate in the rule making process for suction dredge mining in the state of California.

The purpose of our comments is to inform the DFG that in the process of doing their Environmental Impact Study (EIR) to promulgate Suction Dredge Regulations for the State of California, the DFG should seriously consider retaining an expert on Mining laws.

Not unlike the California Department of Fish and Game (DFG), Public Lands for the People Inc. (PLP), has a job to do. The DFG must go by the rules of the Court and the Legislature and PLP must defend the rights that are conveyed to the mining community. This document is PLP's information to the DFG to see that the laws of the land are adhered too in their Rule Making Process.

We respectfully request that the State of California Department of Fish and Game (DFG) et al., in the drafting and or implementing of any restrictions or prohibitions what-so-ever on any and all prospecting and mining activities (including suction dredging mining) that are being performed under the grants of the U.S. Mining Laws of 1866 and 1872, please keep in mind that by the grants themselves within the 1866 and 1872 Mining Laws, miners and prospectors have very unique and specific "rights" entertained by no other members of the public. The U.S. Mining Laws not only grant the claim owner a right of ownership of the minerals on his or her claims, but they also grant the right to mine and extract those minerals. Any unnecessary or unreasonable restriction or prohibition in the acquisition of those minerals on legitimate mining claims would constitute a **"taking".**

Many of the suction dredge mining community are **Citizens** of the State of California. They are also **Citizens** of the United States of America, and as such, have rights

conveyed to them under Federal Statutes and have protections under the 5th and 14th

Amendments to the Constitution of the United States and the property rights guaranteed under the Constitution of the State of California.

The Fifth Amendment to the United States Constitution, made applicable to state and local governments by the Fourteenth Amendment, prohibits the government from taking private property for public use without just compensation.

The California Constitution provides, "Private property may be taken or damaged for public use only when just compensation ... has first been paid to, or into court for, the owner." (Cal. Const., art. I, § 19.)

CALIFORNIA ADMISSION TO UNION
Act for the Admission of California Into the Union
Volume 9
Statutes at Large
Page 452
Whereas, the people of California have presented a constitution and asked admission into the Union, which constitution was submitted to Congress by the President of the United States, by message date February thirteenth, eighteen hundred and fifty, and which, on due examination, is found to be republican in its form of government:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress Assembled, That the State of California shall be one, and is hereby declared to be one, of the United States of America, and admitted into the Union on an equal footing with the original States in all respects whatever.

Sec. 2. And be it further enacted, That until the representatives in Congress shall be apportioned according to an actual enumeration of the inhabitants of the United States, the State of California shall be entitled to two representatives in Congress.

Sec. 3. And be it further enacted, That the said State of California is admitted into the Union upon the express condition that the people of said State, through their legislature or otherwise, **shall never interfere with the primary disposal of the public lands within its limits, and shall pass no law and do no act whereby the title of the United States to, and right to dispose of, the same shall be impaired or questioned;**

and that they shall never lay any tax or assessment of any description whatsoever upon the public domain of the United States, and in no case shall non-resident proprietors, who are citizens of the United States, be taxed higher than residents;

and that all the navigable waters within the said State shall be common highways, and forever free, as well to the inhabitants of said State as to the citizens of the United States, without any tax, impost, or duty therefor.

Provided, That nothing herein contained shall be construed as recognizing or rejecting the propositions tendered by the people of California as articles of compact in the ordinance adopted by the convention which formed the Constitution of that State.
Approved, September 9, 1850.

THIS IS THE IMPORTANT PART
"shall never interfere with the primary disposal of the public lands within its limits, and shall pass no law and do no act whereby the title of the United States to, and right to dispose of, the same shall be impaired or questioned"

The General Mining Law is a land disposal law.

Under those Statutes is the Mining Law of 1872, covered under 30 U.S.C.A. 21 thru 54, and along with other laws; it grants a right to the public to free and open access to the public lands not reserved; for the purposes of exploration for, the claiming of, and the mining of valuable minerals. Pursuant to Federal Law,

"...the locator of a mining claim has a possessory title thereto and the right to the exclusive possession and enjoyment thereof, and this includes the right to work the claim, to extract the minerals therefrom, the right to the exclusive property in such mineral as well as the right to defend his possession." **(30 USC 22.70);** and "Unpatented mining claims are "property" in the highest sense of such term..." **(30 USC 26.94).**

> The U.S. Mining Laws of 1866 and 1872 do not award a mere privilege but instead they **grant the right to real property**, the mining claim holder is a "Mineral Estate Grantee". The right to go upon the open public lands freely for the purpose of prospecting, discovery, exploration, claiming of the minerals upon that land, mining that land for minerals and taking that land to patent. In other words they get to make a living. The Mineral Estate Grantee has accepted a grant from the United States Government and is executing that grant (Mining Acts of 1866 and 1872) through the act of prospecting, locating, filing and mining the minerals located under that grant, **that grant being an executed contract.**

To illustrate this concept the Supreme Court has said:

"A contract is a compact between two or more parties, and is either executory or executed. An executory contract is one in which a party binds himself to do, or not to do, a particular thing;...." "A contract executed is one in which the object **[10 U.S. 87, 137]** of contract is performed; and this, says Blackstone, differs in nothing from a grant...." "A

contract executed, as well as one which is executory, contains
obligations binding on the parties. A grant, in its own nature, amounts to an extinguishment of the right of
the grantor, and implies a contract not to reassert that right. **A party is, therefore, always estopped by his own grant."** Fletcher v. Peck, 10 U.S. 87 (1810)

The Public Lands cannot be "**free and open**" to exploration if the historical means of use by prospectors and miners can be prohibited by the State of California. The State of California may have the power to reasonably regulate activities not incident to mining upon the public lands, but those same regulations fail when they operate to prohibit the customary usage by legitimate prospectors and miners on valid mining claims or in pursuit of such a claim. **These proposed statutory or regulatory amendments are prohibitive and not merely regulatory in fundamental character and, therefore, are unlawful as proposed**. We call your attention to:

INTENT: The intent of the Mining Laws and the continuing intent of Congress is simple and self-evident:

- **The general policy of the mining laws is to promote widespread development of mineral deposits and to afford mining opportunities to as many persons as possible**. (30 USC 22.50) (emphasis added)

and;

> The Congress declares that it is the continuing policy of the Federal Government in the national interest **to foster and encourage private enterprise in** (1) the development of economically sound and stable domestic mining, minerals, metal and mineral reclamation industries, (2) the orderly and economic development of domestic mineral resources, reserves, and reclamation of metals and minerals to help assure satisfaction of industrial, security and environmental needs... For the purpose of this Act 'minerals' shall include all minerals and mineral fuels including oil, gas, coal, oil shale and uranium. **(Mining and Minerals Policy Act of 1970)** (emphasis added)

RIGHTS TO EXCLUSIVE POSSESSION: Not only is the public domain already the land of whomsoever would desire to occupy the land (due to the grants of 1866 – 1872), which land is now held in trust [1] for him, but that the right of possession is exclusively his; to hold and enjoy. This possession is clearly guaranteed by the statutes: So long as the locator complies with statutory requirements and performs assessment work he is **entitled to hold his possession against all the world**, subject to the paramount sovereignty of

United States Court of Appeals,Ninth Circuit.
UNITED STATES of America, Plaintiff-Appellee,
v.
Steve A. HICKS, Defendant-Appellant.
No. 01-30146.
D.C. No. CR-00-00001-DWM.

"Mineral rights are ownership in land, and therefore Lewis is a landowner." See, e.g., United States v. Shoshone Tribe of Indians of Wind River Reservation in Wyo., 304 U.S. 111, 116, 58 S.Ct. 794, 82 L.Ed. 1213 (1938) (with respect to question of ownership, "[m]inerals ... are constituent elements of the land itself"); British-American Oil Producing Co. v. Bd. of Equalization of State of Mont., 299 U.S. 159, 164-65, 57 S.Ct. 132, 81 L.Ed. 95 (1936) **(finding a mineral estate an estate in land)**; Texas Pac. Coal & Oil Co. v. State, 125 Mont. 258, 234 P.2d 452, 453 (1951) ("[l]ands as a word in the law includes minerals"). We need not decide whether the term "landowner" as it is used in Forest Service regulations and orders always includes owners of mineral estates. Here, the government conceded at oral argument that Lewis is a landowner under the terms of the closure order before us and thus exempt from this closure order. The landowner exemption in this closure order must necessarily apply to agents of landowners. For example, corporate landowners can only access their land through agents. **Hicks, as Lewis's agent, is therefore also exempt**.

U.S v. Shumway (Cite as: 1999 WL 1256285 (9th Cir.(Ariz.))) (1997)
No. 96-16480.

"[W]hen the location of a mining claim is perfected under the law, it has the effect of a grant by the United States of the right of present and exclusive possession. The claim is property in the fullest sense of that "term." [FN39] The Court held that the owner of a perfected mining claim "is not required ... to secure patent from the United States; so long as he complies with all provisions of the mining laws, **his possessory right, for all practical purposes of ownership, is as good as though secured by patent."** [FN40]

South Dakota Mining Ass., inc. vs. Lawrence County, (155 F.3d 1005)

"The Supreme Court has set forth the analysis we must apply to determine if a state law is preempted by federal law: State law can be pre-empted in either of two general ways. If Congress evidences an intent to occupy a given field, any state law falling within that field is pre-empted. If Congress has not entirely displaced state regulation over the matter in question, state law is still pre-empted to the extent it actually conflicts with federal law, that is, when it is impossible to comply with both state and federal law, or **where the state law stands as an obstacle to the accomplishment of the full purposes and objectives of Congress.** A local government cannot prohibit a lawful use of the sovereign's

land that the superior sovereign itself permits and encourages. To do so offends both the Property Clause and the Supremacy Clause of the federal Constitution. **The ordinance is prohibitory, not regulatory, in its fundamental character."** (emphasis added)

Ventura County v. Gulf Oil Corporation (9th Circuit)
601 F.2d 1080

"Despite this extensive federal scheme reflecting concern for the local environment as well as the development of the nations resources, Ventura demands a right of final approval. Ventura seeks to prohibit further activity by Gulf until it secures an open space use permit which may be issued on whatever conditions Ventura determines appropriate, or which may never be issued at all. The federal government has authorized a specific use of federal lands, and **Ventura cannot prohibit that use, either temporarily or permanently, in an attempt to substitute its judgment for Congress."**

The Mining Act (30 U.S.C.A. § 22)

30 U.S.C.A. § 22 clearly states: "Except as otherwise provided, all valuable mineral deposits in
lands belonging to the United States, both surveyed and unsurveyed, shall be **free and open to exploration and purchase,** and the lands in which they are found to **occupation** and purchase, by citizens of the United States and those who have declared their intention to become such, under regulations prescribed by law, **and according to the local customs or rules of miners in the several mining districts**, so far as the same are applicable and not inconsistent with the laws of the United States". (emphasis added)

Within the DFG NOP and future rule making process, it appears as though the State of California, in their infinite wisdom have concocted a plan to effectively close or heavily restrict all of the rivers and streams in the State of California from suction dredge mining, while creating a taking of the miner's mineral estate, in violation of the Fifth Amendment and 14th amendments of the United States Constitution. The rule making process also appears to be contrary to federal law and frustrates its intent.

National Mineral Policy Act (30 U.S.C.A. § 21(a)
30 U.S.C.A. § 21(a) clearly states:

"The Congress declares that it is the continuing policy of the Federal Government in **the national interest to foster and encourage private enterprise in** (1) the development of economically sound and stable domestic mining, minerals, metal and mineral reclamation industries, (2) the orderly and economic development of domestic mineral resources, reserves, and reclamation of metals and minerals to

help assure satisfaction of industrial, security and environmental needs, (3) mining, mineral, and metallurgical research, including the use and recycling of scrap to promote the wise and efficient use of our natural and reclaimable mineral resources, and (4) the study and development of methods for the disposal, control, and reclamation of mineral waste products, and the reclamation of mined land, so as to lessen any adverse impact of mineral extraction and processing upon the physical environment that may result from mining or mineral activities." (emphasis added)

The State of California cannot **"foster and encourage"** domestic mining if they use regulations that have a prohibitive, hostile and chilling effect. It is very troubling to see the State of California continue to use general prohibitions in another futile attempt to supplant the power of Congress. The State of California cannot prohibit that which Congress expressly authorized by the Mining Acts. Nor can the State of California effectively repeal said mining law through the use of general prohibitions or regulation. In other words, the State of California can not legally prohibit that which Congress authorized under the Mining Act, which in its self is a **"right of self-initiation"** under said act (see "**The Mining Law of 1872: A Legal and Historical Analysis** by Steven G. Barringer, Esq. 1989). No re-authorization of those rights can be given by the State of California, absent a specific act of Congress with the consent of the Mineral Estate Grantee.

The General Mining Law of 1872, is a clear unequivocal federal grant towards disposal of federal public domain lands, containing valuable minerals, open to such entry. **Absolutely guaranteeing the grantee's the right to mine applicable valuable minerals they own, under reasonable regulation.**

The legislature of California accepted this express provision in 1850, thus as long as the Federal government retains title, the federal interest in providing free access to its own land **in order to promote mining is sufficient to preempt any state law that fundamentally bans such use.** Accordingly under standard preemption analysis any state legislation, or subsequent regulation that conflicts with this overriding federal purpose, must fail.

The purpose of the Mining Act is to encourage mining on federal lands. United States v. Weiss, 642 F.2d 296, 299 (9th Cir.1981) (Weiss); see also United States v. Goldfield Deep Mines Co., 644 F.2d 1307, 1309 (9th Cir.1981), cert. denied, 455 U.S. 907, 102 S.Ct. 1252, 71 L.Ed.2d 445 (1982).

Unpatented mining claims are self-initiated rights granted under the General Mining Law. Congress exercised that discretion in granting those rights under the law. (30 U.S.C.A. § 23, 27-28; 43 U.S.C.A. § 1744; Cole v. Ralph, 252 U.S. 286, 296 (1920).)

In ordinary English, a "claim " is merely a demand for something, or an assertion of a

right where the right has not been established. The phrase "mining claim" therefore probably connotes to most laymen an unsupported assertion or demand from which no legal rights can be inferred. **But that is emphatically not so, as follows;**

In law, the word "claim" in connection with the phrase "mining claim" represents a federally recognized right in real property. The Supreme Court has established that a mining "claim" is not a claim in the ordinary sense of the word--a mere assertion of a right--but rather is a property interest, **which is itself real property in every sense, and not merely an assertion of a right to property.** Benson Mining & Smelting Co. v. Alta Mining & Smelting Co., 145 U.S.428 (1892)

Exclusive Rights

Locator's rights of possession and enjoyment. The locators of all mining locations ... situated on the public domain, their heirs and assigns, ... so long as they comply with the laws of the United States, and with State, territorial, and local regulations not in conflict with the laws of the United States governing their possessory title, **shall have the exclusive right of possession and enjoyment of all the surface included within the lines of their locations"**. (for mining purposes)30 USC § 26.

Once the requirements of the General Mining Law have been met, the right granted by the statute is a **real and private property interest**. Freese v. United States, 639 F.2d 754, 757, 226 Ct.Cl. 252 cert. denied, 454 U.S. 827, 102 S.Ct. 119, 70 L.Ed.2d 103 (1981); Oil Shale Corp. v. Morton, 370 F.Supp. 108, 124 (D.Colo. 1973).

Valid unpatented mining claims are "**property in the fullest sense of that term."** (Wilbur v. United States ex rel. Krushnic, 280 U.S. 306, 316 (1930).) Which entitles the owner "the right to extract all minerals from the claim without paying royalties to the United States." Swanson v. Babbitt, 3 F.3d 1348. Further entitling the holder to "the right to a flow of income from production of the claim." (United States v. Locke, 471 U.S. 84, 104 - 105 (1985).)

Even though title to the fee estate remains in the United States, these **unpatented mining claims are themselves property protected by the Fifth Amendment against uncompensated takings**. See Best v. Humboldt Placer Mining Co., 371 U.S. 334 (1963); cf. Forbes v. Gracey, 94 U.S. 762, 766 (1876); U.S.C.A.Const. Amend. 5; North American Transportation & Trading Co. v. U.S., 1918, 53 Ct.Cl. 424, affirmed 40 S.Ct. 518, 253 U.S. 330; United States v. Locke, 471 U.S. 84, 107, 105 S.Ct. 1785, 1799, 85 L.Ed. 2d 64 (1985); Freese v. United States, 639 F.2d 754, 757, 226 Ct.Cl. 252, cert. denied, 454 U.S. 827, 102 S.Ct. 119, 70 L.Ed. 2d 103 (1981); Rybachek v. United States, 23 Cl.Ct. 222 (1991).

Prospecting, locating and developing of mineral resources in the national forests may not be prohibited nor so unreasonably circumscribed as to amount to a prohibition. Weiss, 642 F.2d at 299,United States Court of Appeals, Ninth Circuit,(1980).

California law recognizes water rights by ownership of riparian land, appropriation, or prescription. Cal.Water Code § 2501. In re Water of Hallett Creek Stream Sys., 749 P.2d 324 (Cal. 1988), cert. denied sub nom. California v. United States, 488 U.S. 824 (1988). The California Supreme Court ruled that the federal government, as owner of nearly half the land in the state, held riparian water rights on the lands it set aside for particular federal purposes**, but that the extent of rights were determined with reference to the interests of other water users**. Id. at 327.

Supremacy Clause

> "This Constitution, and the Laws of the United States which shall be made in Pursuance thereof; and all Treaties made, or which shall be made, under the **authority of the United States, shall be the supreme Law of the land;** and the Judges in every State shall be bound thereby, anything in the Constitution or Laws of any State to the Contrary notwithstanding."

As long as the Federal government retains title, the federal interest in providing free access to its own land in order to **promote mining is sufficient to preempt any state law that fundamentally bans such use**. Thus under standard preemption analysis any state legislation, or regulation that conflicts with this overriding federal purpose, must fail.

Under the Supremacy Clause, any state law that conflicts with a federal law is preempted. Gibbons v. Ogden, 22 U.S. 1 (1824). Any state legislation which frustrates the full effectiveness of federal law is rendered invalid by the Supremacy Clause" regardless of the underlying purpose of its enactors, Perez v. Campbell, 402 U.S. 637, 651-52, 91 S.Ct. 1704, 29 L.Ed.2d 233 (1971)

A conflict exists if a party cannot comply with both state law and federal law. In addition, even in the absence of a direct conflict between state and federal law, a conflict exists if the state law is an obstacle to the accomplishment and execution of the full purposes and objectives of Congress. Crosby v. Nat'l Foreign Trade Council, 530 U.S. 363, 372-73 (2000).

Furthermore, the state here, either is not cognizant of, or intentionally ignores several

unequivocal constraints it is bound by. Article VI, Section 2, of the U.S. Constitution provides that the **"... Constitution, and the Laws of the United States ... shall be the supreme Law of the Land."**

The Court of Appeals, Hansen, Circuit Judge, held that: (1) preemption claim was ripe, and (2) Federal Mining Act preempted ordinance. Affirmed; South Dakota Mining Association Inc v. Lawrence County, 155 F.3d 1005

Obligations binding on the parties. A grant, in its own nature, amounts to an extinguishment of the right of the grantor, and implies a contract not to reassert that right. A party is, therefore, always estopped by his
own grant." Fletcher v. Peck, 10 U.S. 87 (1810)

The Public Lands cannot be "free and open" to exploration if the historical means of use by prospectors and miners can be prohibited by the State of California. The State of California may have the power to reasonably regulate activities not incident to mining upon the public lands, **but those same regulations fail when they operate to prohibit the customary usage by legitimate prospectors and miners on valid mining claims or in pursuit of such a claim.** These proposed statutory or regulatory amendments are prohibitive and not merely regulatory in fundamental character and, therefore, are unlawful as proposed. We call your attention to:

The DFG can not prohibit through regulation or using their discretion
Ventura County v. Gulf Oil Corporation, 601 F.2d 1090 (1979)
(2) Despite this extensive federal scheme reflecting concern for the local environment as well as development of the nations resources, Ventura demands a right of final approval. Ventura seeks to prohibit further activity by gulf until it secures and Open Space Use Permit which may maybe issued on whatever conditions Ventura determines appropriate, or which may never be issued at all. The federal Government has authorized a specific use of federal lands, and **Ventura cannot prohibit that use, either temporarily or permanently, in an attempt to substitute its judgment for that of Congress**.

Recreation is a privilege in most cases and mining is a property right, a grant of land under the federal mining laws of 1866 and 1872. (30 USC 22 – 54). For the DFG to treat miners, prospectors or mining claim owners, (Mineral Estate Grantees) with the same disrespect as given to the recreational activities will certainly exceed DFG's regulatory authority. It would appear that DFG believes they have discretion to regulate suction dredge mining to the point of prohibition. **Case Law says that they can not prohibit prospecting or mining either temporarily or permantly.**

Federal laws are always preeminent: once Congress passes laws that occupy an area, **no government at a lower tier, i.e., at the state or local level**, may pass laws that conflict with the federal laws.

As a miner operating under the U.S. Mining law (30 U.S.C. 22-54) **has a non-discretionary agency "advisory" relationship.** A miner cannot be legally tortured into a CEQA, NEPA, CWA, or ESA scenario. The law also, as the Supreme Court ruled, "stays" the application of the ESA "where it would effectively override otherwise mandatory statutory duties" like (for the purposes of this argument) the mining law. The mining law (Congressional grant) does not by its very nature admit to a permissive system (lease system), otherwise the mining law would be rendered meaningless. The California Department of Fish and Game (DFG) does not authorize mining (the mining law does), the DFG does not fund mining, and the DFG does not carry out the mining, therefore mining under the U.S. Mining law is not by definition a "federal action" subject to the CEQA, NEPA or CWA due to this fact that federal and state involvement or control is non-discretionary in fundamental character. (See also **Karuk v. Forest Service, Supra.)**

In U.S. v. Weiss 642 F.2d at 296:
"Although authority exists for the promulgation of regulations, those regulations may, nevertheless, be struck down when they do not operate to accomplish the statutory purpose or where they encroach upon other statutory rights."

Granite Rock v. US
"...County ordinance is preempted because it conflicts with federal law.
Specifically, we address whether the ordinance conflicts with the Federal Mining Act because it stands as an obstacle to the accomplishment of the full purposes and objectives of Congress embodied in the Act. Granite Rock, 480 U.S. at 581, 107 S.Ct."

South Dakota Mining Assoc. v. Lawrence County 155 F3d 1005 (8th Cir. 1998
Agency actions can often amount to prohibitions that impermissibly encroach upon the right to the use and enjoyment of placer claims for mining purposes (see 30 U.S.C 26). To reinforce this point, in **South Dakota Mining Assoc. v. Lawrence County** 155 F3d 1005 (8th Cir. 1998), at 1011 the court stated: "...government cannot prohibit a lawful use of the sovereign's land that the superior sovereign itself permits and encourages. To do so offends both the Property Clause and the Supremacy Clause of the federal Constitution. The ordinance **is prohibitory, not regulatory, in its fundamental character.**" Emphasis added.

30 U.S.C. 612(b)
so long as the agency regulatory authority over the miner does not become prohibitive. If the miner can work out a reasonable agreement, i.e. contract generally through an "informational", then all is well. If not, then the miner can complain to the surface management agency through written administrative complaint or the appeal process and assert that the agencies actions are unreasonable, material interfering, prohibitive, and why, pursuant to **30 U.S.C. 612(b) (see also U.S. v. Curtis-Nevada Mines** 611 F.2d 1277 at 1285).

Because environmental laws only apply in this setting. Namely the National Environmental Policy Act (NEPA-federal), the Endangered Species
The Court stated in Karuk v. Forest Service 379 F.Supp.2d 1071 at 1094 (N.D. Cal. 2005): "...mining operations take place pursuant to the General Mining Law and the Surface Resources Act, which confers a statutory right upon miners to enter certain public lands for the purpose of mining and prospecting. This **distinction is significant, as it differentiates mining operations from "licenses, contracts, leases, easements, rights-of-way, permits, or grants-in-aid," which are permissive in nature.**

The State of California was admitted into the Union upon the express condition that the people of said State, through their legislature or otherwise, shall never interfere with the primary disposal of the public lands within its limits, and shall pass no law and do no act whereby the title of the United States to, and right to dispose of, the same shall be impaired or questioned.

Commerce Clause

> "But most important of all there was the development of, or more accurately the return to, 596 **the rationales by which manufacturing, 597 mining, 598 business transactions, 599 and the like,** which are antecedent to or subsequent to a move across state lines, are conceived to be part of an integrated commercial whole and therefore subject to the reach of the commerce power."

Today, the Supreme Court said about the Commerce Clause
"we do not have to consider that point" because the hiring of seven out-of-state employees and the purchase of supplies from Los Angeles showed that the mine was "engaged in commerce."

Mining equipment, vehicles, fuel from out of state, and interstate travel and out of state mining claim owners, suction dredge miners all have an effect on the overall economy of the United States. The State of California must recognize these issues. Along with the fact that federal funding that was received for all or parts of the past or present studies and environmental process's make them no less than a welfare recipient and subservient to uphold the laws of the donor of the grant. In this case the laws of the United States.

Funding for part or the entire project is federal funding and in accepting this federal funding, the State of California in doing so, have committed them selves to being under direction and obligation to follow federal law. If Federal funds are enjoyed by the State of California to do part, or the entire project they can not be inconsistent with Federal Law. And certainly the State of California can not come to a conclusion that they can prohibit a mining project for any reason, that of which even the Federal Government can not prohibit.

The current rule making process is putting a **totally unreasonable and unnecessary** burden on themselves, the Mineral Estate Grantee, the Ca. Department of Fish and Game, and the State of California, a burden that neither the State of California nor the Grantee can comply with, with any prudence or effectiveness.

Property Clause" The Congress shall have power to dispose of and make all needful Rules and Regulations respecting...property belonging to the United States "Property Clause", Article IV, Section 3, U.S. Constitution

Congress has overlooked a powerful tool for regulating within state jurisdictions: the **Property Clause** of the United States Constitution. The United States Government owns land in every state and approximately thirty percent of the total land in the United States. The federal government's authority to regulate its **property** within states derives from the **Property Clause** and has been described by the Supreme Court as **"without limitation."**

Multiple-Surface Use Act (30 U.S.C.A. § 612(b) & (615), 612(b) clearly states:

> "Rights under any mining claim hereafter located under the mining laws of the United States shall be subject, prior to issuance of patent therefore, to the right of the United States to manage and dispose of the vegetative surface resources thereof and to manage other surface resources thereof **(except mineral deposits subject to location under the mining laws of the United States).** Any such mining claim shall also be subject, prior to issuance of patent therefore, to the right of the United States, its permittees, and licensees, **to use so much of the surface thereof as may be necessary for such purposes** or for access to adjacent land: **Provided, however, That any use of the surface of any such mining claim by the United States, its permittees or licensees, shall be such as not to endanger or materially interfere with prospecting, mining or processing operations or uses reasonably incident thereto...**" (emphasis added)

If the "United States" themselves are prohibited from "any use" of the surface of a mining claim **(including so-called protection of fish) that endangers or materially interferes "...with prospecting, mining or processing operations or uses reasonably incident thereto..."**, then there is no legal way for the State of California to **"endanger or materially interfere..."** with a mining claimant or his representatives on a valid existing mining claim.

What prudent man would go into a business that requires expending the time for education, the cost for that education, cost to buy or file a claim, the cost of acquiring the equipment for that business without assuring him self an opportunity to make that business his lifetime goal for success and livelihood for himself and his family?

When a party decides to go in business whether it is a store or mining business, they have crucial investments. If the grantee applies and receives a license or a permit it should be protected as long as his activity is legal under the mining laws of the United States. It should be good until the grantee decides to make some major change that would affect conditions of that license or permit or grant. They should be guaranteed to work under that license or permit or grant. The Mineral Estate Grantee should be able to expect the same benefit that any other businessman would. Especially since the **Grant is just that, a grant (contract) and not a licensed or a permitted activity, that is *not* discretionary.** The Grantee has a contract with the Federal Government to do business, **not just a maybe**, and should not have to have to be concerned whether he is going to be able to suction dredge mine in the following years or months. He is under the Grandfather clause for his own protection.

Endangered Species Act

Suction Dredge Mining is not a recreational activity which would fall under the same regulatory scheme as recreation. Most suction dredgers are either valid mining claim owners or agents of claim owners and are consequently property owners in the truest sense of the word.

Karuk Tribe v United States Forest Service NO. C-04-4275 SBA

> "Forest Service's acceptance of four notices of intent (NOI) to conduct mining operations in a National Forest, on basis that the operations were not likely to cause a significant disturbance of surface resources, did not constitute a "federal action" within the meaning of the Endangered Species Act (ESA) and thus did not violate its duty under ESA to comply with consultation requirements; **miners were all private entities, Service's review of the NOIs did not amount to an authorization,** mining operations were authorized by statute **rather than merely permissive, and Service had no discretionary control over the NOIs process.** Endangered Species Act of 1973, § 7(a)(2), 16 U.S.C.A. § 1536(a)(2); 50 C.F.R. § § 402.02, 402.03." (emphasis added)

Here we must address the **Endangered Species Act (ESA).** It is one thing to protect an endangered or threatened species but not to the degree of taking ones use for of his property rights. For example the DFG does all of the mitigation allowed for on their own, in the process of their rule making all the while denying the miner any right to mitigation on an individual basis. Not all rivers have threatened or endangered species and the proof of harm is not conclusive in any of the scientific studies on any fish. Some streams do not even have fish especially anadramous fish or redd beds.

The U.S. Supreme Court in 2007 clarified the meaning of "discretionary agency action" in **Home Builders v. Defenders of Wildlife** 127 S.Ct. 2518 at 2534 where they stated:

" Agency discretion presumes that an agency can exercise "judgment" in connection with a particular action. See Citizens to Preserve Overton Park, Inc. v. Volpe, 401 U.S. 402, 415-416, 91 S.Ct. 814, 28 L.Ed.2d 136 (1971); see also Random House Dictionary of the English Language 411 (unabridged ed.1967) ("discretion" defined as "the power or right to decide or act according to one's own judgment; freedom of judgment or choice"). As the mandatory language of § 402(b) itself illustrates, **not every action authorized, funded, or carried out by a federal agency is a product of that agency's exercise of discretion.**

This history of the regulation also supports the reading to which we defer today. As the dissent itself points out, the proposed version of § 402.03 initially stated that "Section 7 and the requirements of this Part apply to all actions in which there is Federal involvement or control,"48 Fed.Reg. 29999 (1983) (emphasis added); the Secretary of the Interior modified this language to provide (as adopted in the Final Rule now at issue) that the statutory requirements apply to "all actions in which there is discretionary Federal involvement or control,"51 Fed.Reg. 19958 (1986 (emphasis added). The dissent's reading would rob the word "discretionary" of any effect, and substitute the earlier, proposed version of the regulation for the text that was actually adopted.

In short, we read § 402.03 to mean what it says: that § 7(a)(2)'s no-jeopardy duty covers only discretionary agency actions and **does not attach to actions** (like the NPDES permitting transfer authorization) **that an agency is required by statute to undertake once certain specified triggering events have occurred.** This reading not only is reasonable, inasmuch as it gives effect to the ESA's provision, but also comports with the canon against implied repeals because it stays § 7(a)(2)'s mandate where it would effectively override otherwise mandatory statutory duties."

Even if they spawning beds were present on a stretch of stream bed, they are not present on the full length of a mining claim. With that in mind it is incumbent on the DFG to look at the individual situation and determine what can be done to circumvent the problem or to allow the miner to mitigate a situation that arises

We were told by DFG representatives that a court case prevents the DFG from issuing special use permits, this categorically untrue. There is no court case or court decision addressing the fact that the DFG does not have authority to issue special use permits, as a matter of fact it is factual that if the DFG does not have authority to issue a special use permit it would stand that they do not have the authority to issue any permit for suction dredging at all.

National Association of Homebuilders v Defenders of Wildlife (2007)
(Cite as: 127 S.Ct. 2518)

> "That in Applying Chevron, we defer to the agency's reasonable interpretation of the ESA sec. 7 (a) (2) as applying only to "actions" in which there is discretionary

Federal involvement or control. 50 CFR sec. 402.03. (emphasis added)

"Court will not infer that subsequent statute repeals an earlier enactment, unless the later statute expressly contradicts original act, or unless such a construction is absolutely necessary in order for words of the later statute to have any meaning at all; outside of these limited circumstances, statute dealing with narrow, precise, and specific subject is not submerged by a later enacted statute covering more generalized spectrum." (emphasis added)

(2) "regulation purporting to apply consultation and no-jeopardy mandates of the Endangered Species Act (ESA), which require federal agencies to consult with other agencies to ensure that proposed agency action is not likely to jeopardize any **endangered or threatened species, only in situations in which there is discretionary federal involvement or control,** was reasonable interpretation entitled to deference;" (emphasis added)

No where in the Endangered Species Act does it address the Mining Acts of 1866 or 1872. the State of California "**may**" (and PLP use's the word "may" loosely) have authority to regulate suction dredge mining... but **Federal Law states that the regulations must be "reasonable", necessary, and yet not materially interfere with the Mineral Grant**.

That means **"reasonable"** to the Mineral Estate Grantee (miner) as well as The State of California. For State of California to deny or prohibit temporarily or permanently the mining operation permit for any reason and to create a paper snafu with prohibition is not reasonable to the miner but in fact works to create a prohibition on mining, something even the Federal land management agencies have no authority to do.

This also leads us to the **denial by the DFG** for **year round** mining on all mining claims (Mineral Estates) or prospecting efforts on California rivers, or not to issue **Special Use Permits** for extended seasons or larger or different equipment creates temporary or permanent take under the 5th amendment of the U.S. Constitution . Without the ability of the miner to acquire the full year round use of their claims or rights to prospect is contrary to all property rights and mining laws, even under the California Constitution.

Arizona Cattle Growers Association v. United States Bureau of Land Management (CV-97-02416-DAE/CV-99-0673-RCB (9th Cir, 2001).
The 9th Circuit Court determined it was arbitrary and capricious for the federal government to (1) "issue or not issue an incidental take statement (ITS) not predicated on an actual "take" (2) "impose land use conditions under the ESA where there was no evidence that the species occupied the territory at issue or that a take would occur if the

land use permit(here grazing permits)were issued", and (3)"issue an ITS that included **terms that "so vague as to preclude compliance therewith"**

Marbled Murrelet, 83 F.3dat 1074

> "Finally, pursuant to Marbled Murrelet, the Court finds that Plaintiff's generalized challenge to the "discretionary" nature of the Forest Service's implementation of the NOI review process is insufficient to invoke the ESA. Although, here, the Forest Service engaged in an interactive process with the miners prior to the start of the 2004 mining season, which process involved a discussion of the types of activities that would be considered a significant disturbance of surface resources, this process is most properly considered the type of "**advisory" conduct that does not trigger the ESA.** Marbled Murrelet, 83 F.3d. at 1074. (emphasis added)

Indeed, as the Ninth Circuit stated in Marbled Murrelet:

> "Protection of endangered species would not be enhanced by a rule which would require a federal agency to perform the burdensome procedural tasks mandated by section 7 [of the ESA] simply because it advised or consulted with a private party. Such a rule would be a disincentive for the agency to give such advice or consultation. **Moreover, private parties who wanted advice on how to comply with the ESA would be loathe to contact the [agency] for fear *1103 of triggering burdensome bureaucratic procedures.** As a result, desirable communication between private entities and federal agencies on how to comply with the ESA would be stifled, and protection of threatened and endangered species would suffer. Id. at 1074-75." (emphasis added)

> **Pennsylvania Coal Mining Company v. Mahon** (260 U.S. 393, 43 S. Ct. 158, 67 L. Ed. 322 (1922). The Court noted that regulatory activity can "go too far".

> **Penn Central Transportation Co. v New York City, (**438 U.S. 104, 98 S. Ct. 2646, 57 L. ED. 2d 631 (1978). Takings claims are evaluated by examining and balancing three factors (1) The economic impact of the regulatory action on the property; (2) the extent to which legitimate property use expectations exist and have been interfered with; and (3) The extent to which the government has used reasonable means to achieve an important public objective. When undertaking this evaluation, the Court must consider the impact on the entire property owner's interest at stake, not just the portion subjected to the regulation.

The State of California seems oblivious to the possibility of the taking of one's property with their attempts for extreme prohibition of not issuing permits or special use permits for suction dredge mining on valid existing mining claims.

United States v Kosanke Sand Corporation
(cite as: 12 IBLA 282)

*288 "It is our conclusion that 'existing law applicable to the agency's operations,' viz., the General Mining Act of 1872, as amended, supra, under which the claims herein involved were located, and which opens to location and purchase, '[e]xcept as otherwise provided, all valuable mineral deposits in lands belonging to the United States, * * * and the lands in which they are found * * *', 30 U.S.C. § 22 (1970), **'makes compliance impossible** "This comports with the position of the Department when it reported in 1971 to the Council on Environmental Quality that the General Mining Act of 1872 do[es] not admit of environmental considerations."

"To the extent that the mining laws give to individuals the right to enter the public domain, to locate claims thereon, to discover minerals therein, and to extract and remove those minerals there from, all without prior approval of the United States, the development of a **mining claim cannot be tortured into 'Federal action,' major, minor or otherwise.**" (emphasis added)

If the United States can not torture a miner into a Federal Action, major, minor or otherwise, what makes State of California believe that they can torture the same Mineral Estate Grantee (miner) **into a Federal or State Action, major minor or otherwise?**

HR 365, Mining Act of 1866, 39th Congress (1866 Mining Law) Sec. 1
"That the mineral lands of the public domain, both surveyed and unsurveyed, are hereby declared to be free and open to exploration and occupation by all citizens of the United States, and those who have declared their intention to become citizens, subject to such regulations as may be prescribed by law, and subject also to the local custom or rules of miners in the several mining districts, so far as the same **may not be in conflict with the laws of the United States"**

INTENT: The intent of the Mining Laws and the continuing intent of Congress is simple and self-evident:

<u>The general policy of the mining laws is to promote widespread</u>

development of mineral deposits and to afford mining opportunities to as many persons as possible. (30 USC 22.50) (emphasis added)

and;

> The Congress declares that it is **the continuing policy** of the Federal Government in the national interest **to foster and encourage private enterprise** in (1) the development of economically sound and stable domestic mining, minerals, metal and mineral reclamation industries, (2) the orderly and economic development of domestic mineral resources, reserves, and reclamation of metals and minerals to help **assure satisfaction of industrial, security and environmental needs**... For the purpose of this Act 'minerals' shall include all minerals and mineral fuels including oil, gas, coal, oil shale and uranium. (Mining and Minerals Policy Act of 1970) (emphasis added)

RIGHTS TO EXCLUSIVE POSSESSION: Not only is the public domain already the land of whomsoever would desire to occupy the land (due to the grants of 1866 – 1872), which land is now held in trust [2] for him, but that the right of possession is exclusively his; to hold and enjoy. This possession is clearly guaranteed by the statutes:

So long as the locator complies with statutory requirements and performs assessment work he **is entitled to hold his possession against all the world,** subject to the paramount sovereignty of Suction dredging is a ministerial act or Project in accordance with the California Environmental Quality Act (CEQA), Suction Dredge Mining or prospecting on a federal mining claim is not discretionary as alluded to in the DFG Notice of Preparation (NOP). A miner on a valid mining claim is a private actor.

California Environmental Quality Act (CEQA)
CEQA does not apply to ministerial actions which may impact a historical resource.

For example, a project which complies with the Uniform Building Code and for which no discretionary permit is required does not fall under CEQA, even if the project may alter a building which is considered a "qualified historic structure" under the State Historical Building Code **(Prentiss v. City of South Pasadena (1993) 15 Cal.App.4th 85)**. Common ministerial actions include roof replacement, interior remodeling, or other activities which require only a non-discretionary building permit. A ministerial action applies fixed standards or objective measurements and involves "little or no personal judgment by a public official as to the wisdom or manner of carrying out the project" (*Guidelines* Section 15369).

Significant effect on the environment: Under CEQA, "a significant effect on the environment means a **substantial, or potentially substantial, adverse change** in any of the physical conditions within the area affected by the project including land, air, water,

minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance" (CEQA Guidelines Section 15382).

There has been **no significant or substantial change** in methods used for suction dredge mining since the inception of its permitting by the legislature in 1961. Consequently there is no need for consideration of a law that is prohibitive in nature.

Suction Dredge Mining nor any other form of modern day mining is discretionary and in the case of California's CEQA suction dredge mining is a ministerial action and can not be classified as discretionary. (CEQ Guidelines 15260 – 15285)

Public Resources Code
Section 21080-21098

21080. " (a) Except as otherwise provided in this division, this **division shall apply to discretionary projects proposed to be carried out or approved by public agencies**, including, but not limited to, the enactment and amendment of zoning ordinances, the issuance of zoning variances, the issuance of conditional use permits, and the
approval of tentative subdivision maps unless the project is exempt from this division.
(b) This division does not apply to any of the following activities:
(1) **Ministerial projects** proposed to be carried out or approved by public agencies.
(2) Emergency repairs to public service facilities necessary to maintain service.
(3) Projects undertaken, carried out, or approved by a public agency to maintain, repair, restore, demolish, or replace property or facilities damaged or destroyed as a result of a disaster in a disaster-stricken area in which a state of emergency has been proclaimed by the Governor pursuant to Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code."

Assessment of environmental consequences of state action

Some state statutes require the public agency concerned with the proposed action to consider alternatives to that action; to make a threshold determination as to the effect of the proposal on the environment; and, if the proposal qualifies under the wording of the specific statute, as a commercial development, or a project, action, or major action, significantly affecting the environment, to prepare an environmental impact report or statement in accordance with the procedure outlined in the statute.

Some statutes particularize the factors which must be considered in making an environmental assessment, such as the ability to meet pollution control standards, or the effect of the project on water supplies, or the existing environment, and other statutes provide general guidelines with which the statement or report must comply. While the objectives of a state environmental statute cannot be avoided by dividing a single project

into small pieces which individually have a minimal potential impact on the environment, **no purpose can be served by requiring that the impact statement or report speculate as to environmental consequences of future developments that are unspecified and uncertain.**

The question is: how can the Department of Fish and Game DFG **make an impossible determination of an absolute fact** that the activity is not deleterious when all of the scientific studies are speculative and not conclusive? The law does not allow for the agency or the dredger to comply with the impossible. For your information: An environmental impact report (EIR) must contain facts and analysis, not just the bare conclusions of the agency. Gray v. County of Madera, 167 Cal. App. 4th 1099, 85 Cal. Rptr. 3d 50 (5th Dist. 2008)

Here we see the DFG using that is for most purposes political rather than scientific. It is evident in the scientific study determinations of not being conclusionary but instead are speculative and argumentative among the different studies themselves, the might be, could be, potentially or possibly language. For the scientist to come to a conclusion, yes it is or no it isn't, would dry up their funding and grant money. This can only bring PLP to the conclusion that the use of these studies by the DFG will be a violation the environmental assessment ", **no purpose can be served by requiring that the impact statement or report speculate as to environmental consequences of future developments that are unspecified and uncertain."**

CUMULATIVE SUPPLEMENT (cases)

Errors in environmental impact report's (EIR's) analysis of the adequacy of mitigation measures to address quarry project's impacts on water, adequacy of mitigation measures with respect to traffic, **cumulative impact on noise levels, and cumulative impacts in general precluded informed decision making** and informed public participation and thus were prejudicial. Gray v. County of Madera, 167 Cal. App. 4th 1099, 85 Cal. Rptr. 3d 50 (5th Dist. 2008).

An environmental impact report (EIR) must contain facts and analysis, not just the bare conclusions of the agency. Gray v. County of Madera, 167 Cal. App. 4th 1099, 85 Cal. Rptr. 3d 50 (5th Dist. 2008).

Notwithstanding the exemption from some chapters of California Environmental Quality Act (CEQA), the timber harvesting plan (THP) preparation and approval process is the functional equivalent of the preparation of an environmental impact report (EIR) contemplated by CEQA. West's Ann.Cal.Pub.Res.Code §§ 4511 et seq., 21000 et seq. Ebbetts Pass Forest Watch v. California Dept. of Forestry and Fire Protection, 43 Cal. Rptr. 3d 363 (Cal. App. 5th Dist. 2006), as modified on denial of reh'g, (May 15, 2006) and review granted and opinion superseded, (July 19, 2006).

In order to determine whether a project has a significant effect on the environment, **it is necessary to consider the impact of the total project** rather than a single aspect of the project. Juanita Bay Valley Community Ass'n v. City of Kirkland, 9 Wash. App. 59, 510 P.2d 1140, 5 Env't. Rep. Cas. (BNA) 1769 (Div. 1 1973)

[FN53] Russian Hill Improvement Assn. v. Board of Permit Appeals, 44 Cal. App. 3d 158, 118 Cal. Rptr. 490 (1st Dist. 1974), appeal dismissed, 422 U.S. 1030, 95 S. Ct. 2646, 45 L. Ed. 2d 687 (1975) (applying a statute requiring the environmental impact report to set forth in writing (1) the environmental impact of the proposed action, (2) any adverse environmental effects which cannot be avoided if the proposal is implemented, (3) **mitigation measures to minimize the impact,** (4) alternatives to the proposal, (5) the relationship between local and short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and (6) any irreversible environmental changes which would be involved should the proposed action be implemented); Eastlake Community Council v. Roanoke Associates, Inc., 82 Wash. 2d 475, 513 P.2d 36, 5 Env't. Rep. Cas. (BNA) 1897, 3 Envtl. L. Rep. 20867, 76 A.L.R.3d 360 (1973)

To a fault the scientific studies address any effects from suction dredging mining are local and short term environmental effects and **there is no evidence in any of the studies addressing irreversible changes to the environment.** The EIR needs to address the fact that there are no known long term impacts from suction dredge mining and take this under consideration in the rule making process.

> In **Minnesota Public Interest Research Group v. Minnesota Environmental Quality Council, 306 Minn. 370, 237 N.W.2d 375 (1975),** the court affirmed a lower court ruling that the construction of an exploratory copper-nickel mine shaft by an exploration company was a private action of only local significance which did not require an environmental impact report. It found the project to be distinguishable from the actual copper-nickel mining.
>
> **[FN55] Lake County Energy Council v. County of Lake, 70 Cal. App. 3d 851, 139 Cal. Rptr. 176, 7 Envtl. L. Rep. 20699 (1st Dist. 1977)** (while there is no requirement that the report engage in sheer speculation as to future environmental consequences, if the agency preparing the report has fairly reliable information about prospective developments, such information should be given, even though there is no right of control over such secondary effect).\

Again we discuss the fact that **a mining activity is a private actor** and again there is only a local and short term consequence and for the DFG to speculate on future environmental consequence is unnecessary and unwarranted and cannot be used to come to a negative conclusion on suction dredge mining.

California will not be significantly affected. That is manifestly untrue. In fact, this CEQA study will certainly have a significant affect on California's Mineral Recourses, and by CEQA guidelines, **"Mineral Resource" must be included**. If not, this CEQA study is fatally flawed from the beginning.

Public Resources Code, Section 21002.1 (a) states that:
"The purpose of an environmental impact report is to identify the significant effects of a project on the environment, to identify alternatives to the project, and to indicate the manner in which those significant effects can be mitigated or avoided."

If potential environmental impacts are identified, the agency is then **required to analyze what is necessary to mitigate** them and or select feasible alternatives.

With regard to "suction dredge gold mining", within unpatented mining claims, there are no feasible **"alternatives", other than temporary seasonal , or permanent closures. Both would effect regulatory "takings"** of private property interests held by all affected unpatented mining claim owners. Any seasonal restriction (where unpatented mining claim are situated), "is a temporary" "taking" Ventura County v. Gulf Oil Corporation, 601 F.2d 1090 (1979).

Generally, "economic impacts" need not be included within a "CEQA" study. As economic impacts are not potential, or actual physical changes to the environment. Here however, **when temporary, or permanent closures** of given area's are utilized to "mitigate" or "avoid" significant effects to the environment attributed to suction dredging, economic impact is relevant to measure the significance of an environmental impact.

Any purported CEQA study that utilizes a "one size fits all" methodology is therefore fundamentally flawed.

Title 14. California Code of Regulations
Chapter 3. Guidelines for Implementation of the California Environmental Quality Act
Article 19. Categorical Exemptions

15300. Categorical Exemptions
Section 21084 of the Public Resources Code requires these Guidelines to include a list of classes of projects which have been determined not to have a significant effect on the environment and which shall, therefore, be exempt from the provisions of CEQA. In response to that mandate, the Secretary for Resources has found that the following classes of projects listed in this article do not have a significant effect on the environment, and

they are declared to be categorically exempt from the requirement for the preparation of environmental documents. Note: Authority cited: Section 21083, Public Resources Code; Reference: Section 21084, Public Resources Code.

15300.1. Relation to Ministerial Projects
Section 21080 of the Public Resources Code exempts from the application of CEQA those projects over which public agencies exercise only ministerial authority. Since ministerial projects are already exempt, categorical exemptions should be applied only where a project is not ministerial under a public agency's statutes and ordinances.

CA DF&G themselves held that issuance of a dredging permits, is MINISTERIAL

15304. Minor Alterations to Land
Class 4 consists of minor public or private alterations in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees except for forestry or agricultural purposes. Suction dredge fits inside this exemption.

15330. Minor Actions to Prevent, Minimize, Stabilize, Mitigate or Eliminate the Release or Threat of Release of Hazardous Waste or Hazardous Substances.
Class 30 consists of any minor cleanup actions taken to prevent, minimize, stabilize, mitigate, or eliminate the release or threat of release of a hazardous waste or substance which are **small or medium removal actions costing $1 million or less.** Suction dredging fits here also, as it certainly removes toxic mercury & lead

The U.S. Supreme Court has unequivocally determined "unpatented mining claims" are private property, subject to Constitutional protection from "taking", without compensation. **Given that fact, this CEQA study must include an economic analysis,** on its effects, as they pertain to "suction dredge gold mining" on mining claims. In-so-far as this CEQA study result take's" hundreds of millions, if not a billions of dollars in compensable private property rights belonging to affected mining claim owners.

"This Constitution and the laws of the United States which shall be made in pursuance thereof...shall be the supreme law of the land; and the judges in every state shall be bound thereby, anything in the Constitution or laws of any state to the contrary notwithstanding." Supremacy Clause, Article VI U.S. Constitution

The General Mining Law of 1872, is a clear unequivocal federal grant towards disposal of federal public domain lands, containing valuable minerals, open to such entry. **Absolutely guaranteeing the grantee's the right to mine applicable valuable minerals they own, under reasonable regulation.**

The legislature of California accepted this express provision in 1850, thus as long as the

Federal government retains title, the federal interest in providing free access to its own land in order to promote **mining is sufficient to preempt any state law that fundamentally bans such use.** Accordingly under standard preemption analysis any state legislation, or subsequent regulation that conflicts with this overriding federal purpose, must fail.

The purpose of the Mining Act is to encourage mining on federal lands. United States v. Weiss, 642 F.2d 296, 299 (9th Cir.1981) (Weiss); see also United States v. Goldfield Deep Mines Co., 644 F.2d 1307, 1309 (9th Cir.1981), cert. denied, 455 U.S. 907, 102 S.Ct. 1252, 71 L.Ed.2d 445 (1982).

Unpatented mining claims are **self-initiated rights granted** under the General Mining Law. Congress exercised that discretion in granting those rights under the law. (30 U.S.C.A. § 23, 27-28; 43 U.S.C.A. § 1744; Cole v. Ralph, 252 U.S. 286, 296 (1920).)

In law, the word "claim" in connection with the phrase "mining claim" represents a federally recognized right in real property. The Supreme Court has established that a mining "claim" is not a claim in the ordinary sense of the word--a mere assertion of a right--but rather is a property interest, which is itself real property in every sense, and not merely an assertion of a right to property. **Benson Mining & Smelting Co. v. Alta Mining & Smelting Co., 145 U.S.428 (1892)**

Locators' rights of possession and enjoyment. The locators of all mining locations … situated on the public domain, their heirs and assigns, … so long as they comply with the laws of the United States, and with **State, territorial, and local regulations not in conflict with the laws of the United States** governing their possessory title, shall have the exclusive right of possession and enjoyment of all the surface included within the lines of their locations". (for mining purposes)30 USC § 26.

Valid unpatented mining claims are **"property in the fullest sense of that term."** (Wilbur v. United States ex rel. Krushnic, 280 U.S. 306, 316 (1930).) Which entitles the owner "the right to extract all minerals from the claim without paying royalties to the United States." Swanson v. Babbitt, 3 F.3d 1348. Further entitling the holder to "the right to a flow of income from production of the claim." (United States v. Locke, 471 U.S. 84, 104 - 105 (1985).)

Even though title to the fee estate remains in the United States, these unpatented mining claims are themselves **property protected by the Fifth Amendment against uncompensated takings.** See Best v. Humboldt Placer Mining Co., 371 U.S. 334 (1963); cf. Forbes v. Gracey, 94 U.S. 762, 766 (1876); U.S.C.A.Const. Amend. 5; North American Transportation & Trading Co. v. U.S., 1918, 53 Ct.Cl. 424, affirmed 40 S.Ct. 518, 253 U.S. 330; United States v. Locke, 471 U.S. 84, 107, 105 S.Ct. 1785, 1799, 85

L.Ed. 2d 64 (1985); Freese v. United States, 639 F.2d 754, 757, 226 Ct.Cl. 252, cert. denied, 454 U.S. 827, 102 S.Ct. 119, 70 L.Ed. 2d 103 (1981); Rybachek v. United States, 23 Cl.Ct. 222 (1991).

Water Rights

California law recognizes water rights by ownership of riparian land, appropriation, or prescription. Cal.Water Code § 2501. In re Water of Hallett Creek Stream Sys., 749 P.2d 324 (Cal. 1988), cert. denied sub nom. California v. United States, 488 U.S. 824 (1988). The California Supreme Court ruled that the federal government, as owner of nearly half the land in the state, held riparian water rights on the **lands it set aside for particular federal purposes**, but that the extent of rights were determined with reference to the interests of other water users. Id. at 327.

California law **recognizes water rights by ownership of riparian land**, appropriation, or prescription. Cal.Water Code § 2501. In re Water of Hallett Creek Stream Sys., 749 P.2d 324 (Cal. 1988), cert. denied sub nom. California v. United States, 488 U.S. 824 (

What becomes plain to anyone knowledgeable in the area of federal lands, and mining law, in reading, and trying to respond to this initial study report. Is that DFG themselves & the company that they contracted to compile, and perform the EIR, lack a basic understanding of fundamental law, and facts governing federal public domain & mining on it.

FACT 1. The vast majority of all suction dredge gold mining in California takes place on federal public domain lands.

FACT 2.The vast majority of those same federal lands, are open to mineral entry under federal mining laws & where gold exists are held under mining claims.

FACT 3. Mining on federal lands, is encouraged by federal policy directive & governed by federal law & regulation.

FACT 4. Once a valid mining claim is established, it grants the owner various protected private property rights.

FACT 5. State law, and regulation cannot prohibit what federal law encourages, and allows.

What we have here is a state agency who's primary responsibility is to regulate California's fish & game as follows:

DFG CODE Section 200
200. There is hereby delegated to the commission the power to regulate the taking or possession of birds, mammals, fish, amphibia, and reptiles to the extent and in the manner prescribed in this article.

201. Nothing in this article confers upon the commission any power to regulate any natural resources or commercial or other activity connected therewith, except as specifically provided.

DFG Section 201 provisions creates a conundrum, because valuable minerals are a "natural resource", and mining is both "commercial" & "activity" connected to it.

Written Notice Required

DFG has no statutory authority over "mineral resources' within California.
No one can rationally refute that 'mining claims" involve 'mineral resources", and their extraction. No one can credibly refute the majority of all suction dredge gold mining in California takes place on mining claims.

A CEQA process is neither legitimate, or legal.
If the property owners are not given timely legal "notice" of the "project", involving their property.

The state of California by passage of SB 670 mandated the issuance of small scale suction dredge gold mining permits is a "project" subject to CEQA requirements. In doing so, the state of California automatically made all active suction dredge gold mining permit holders "proponents" of this CEQA "project".

However, **DFG did not give written "Notice" to all affected individual mining claim owners in California**, SB 670 automatically made "project proponents". The CEQA process is normally triggered by a person, entity or agency applying for a "permit" to do something that may have a significant adverse effect on California's environment. If that is found to be the case, and the proposed project is not covered by any CEQA "exemptions". The CEQA process is triggered, and proceeds.

That whole CEQA body of law, regulation, and agenda is based on the premise, that a person, or entity having made an application for a permit, certainly has knowledge, and constructive notice of the process, as the applicant, or applicants themselves initiated it.

In this case, that is absolutely not so. Because all prospective applicants **(i., e., all mining claim owners in California)** who's private property rights will certainly be profoundly affected by this CEQA project, neither have, or were given "notice" of them being arbitrarily placed in the position of CEQA project applicants, or proponents.

In effect, what we have here is an adjudicative land use decision process, without the land, or property rights owners (i., e., mining claim owners) being legally informed, or given actual notice of the adjudication of crucial matters intensely affecting each of them, and all of their individual private property rights combined. **This alone violates the Browns Act**

Under those factual conditions, without actual notice to all effected fee simple property and mining claim owners, the whole of the CEQA, APA process is fundamentally flawed from the beginning. For instance, DFG scheduled three public "scoping" meetings the 16th, 17th & 18th of November, 2009, so that involved parties could submit questions, and or comments on the process. Written comments on the process will not be entertained, if not submitted by December 3, 2009.

The fact that DFG gave **no actual written notice to all affected patented, or unpatented "mining claim owners",** statewide throughout California. Them lacking such notice of the process, scoping meetings, and comment submission deadline periods compounds the critical flaws being made here, one after the other by the state of California, and the lead agency (DFG).

These critical administrative and procedural errors here, one after another, fatally "taint" the complete CEQA process regarding small scale suction dredge gold mining permits. To the degree each error, or cumulative multiple errors make the process more, and more subject to a whole series of "judicial" challenges. One, any, or all of which will certainly be brought by affected parties, in order to protect their private property rights.

Anyone thinking that all mining claim owners in California will stand idly by, doing nothing, while the state perpetrates an illegal regulatory "taking" of their property. Which **deprives the owners of all of their property's utility and value.** Unlawfully denying them of every benefit of the private property they own. Here, the California legislature, and DFG is grossly mistaken, as doing so is a constitutionally forbidden de facto taking without compensation. Which mining claim owners throughout California will never allow.

CEQA § 21082.2. SIGNIFICANT EFFECT ON ENVIRONMENT; DETERMINATION;
ENVIRONMENTAL IMPACT REPORT PREPARATION

(a) The lead agency shall determine whether a project may have a significant effect on the environment based on substantial evidence in light of the whole record.

(b) The existence of public controversy over the environmental effects of a project shall not require preparation of an environmental impact report if there is no substantial evidence in light of the whole record before the lead agency that the project may have a significant effect on the environment.

(c) Argument, speculation, unsubstantiated opinion or narrative, evidence which is clearly inaccurate or erroneous, or evidence of social or economic impacts which do not contribute to, or are not caused by, physical impacts on the environment, is not substantial evidence. Substantial evidence shall include facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts.

(d) If there is substantial evidence, in light of the whole record before the lead agency, that a project may have a significant effect on the environment, an environmental impact report shall be prepared.

(e) Statements in an environmental impact report and comments with respect to an environmental impact report shall not be deemed determinative of whether the project may have a significant effect on the environment.

CEQA requires that decisions be informed and balanced. It must not be subverted into an instrument for the oppression and delay of social, economic, or recreational development or advancement. (Laurel Heights Improvement Assoc. v. Regents of U.C. (1993) 6 Cal.4th 1112 and Citizens of Goleta Valley v. Board of Supervisors (1990) 52 Cal.3d 553)

The purpose of CEQA is not to generate paper, but to compel government at all levels to make decisions with environmental consequences in mind. (Bozung v. LAFCO (1975) 13 Cal.3d 263).

The lead agency must consider the whole of an action, not simply its constituent parts, when determining whether it will have a significant environmental effect. (Citizens Assoc. For Sensible Development of Bishop Area v. County of Inyo (1985) 172 Cal.App.3d 151)

15384. SUBSTANTIAL EVIDENCE

(a) "Substantial evidence" as used in these guidelines means enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached. Whether a fair argument can be made that the project may have a significant effect on the environment is to be determined by examining the whole record before the lead agency. **Argument, speculation, unsubstantiated opinion or narrative, evidence which is**

clearly erroneous or inaccurate, or evidence of social or economic impacts which do not contribute to or are not caused by physical impacts on the environment does not constitute substantial evidence.

(b) Substantial evidence shall include facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts.

§ 21166. SUBSEQUENT OR SUPPLEMENTAL IMPACT REPORT; CONDITIONS

When an environmental impact report has been prepared for a project pursuant to this division, no subsequent or supplemental environmental impact report shall be required by the lead agency or by any responsible agency, unless one or more of the following events occurs:

(a) Substantial changes are proposed in the project which will require major revisions of the environmental impact report.

(b) Substantial changes occur with respect to the circumstances under which the project is being undertaken which will require major revisions in the environmental impact report.

There have not been any substantial changes in the methods or operations of suction dredge mining nor has there been any substantial changes in the scientific studies that address the effects of suction dredge mining.

(c) New information, which was not known and could not have been known at the time the environmental impact report was certified as complete, becomes available.

PLP must ask the DFG to bring forth the new information that has been brought forth to show new environmental impacts related to suction dredge mining since the 1994 EIR? Otherwise DFG must be violation of above code.

3.3.15 Mineral Resources

Introduction

The purpose of the **"Mineral Resources"** section is to identify and evaluate the potential for the project to **adversely affect the availability of known mineral resources**. The mineral resources of concern include metals, industrial minerals (e.g., aggregate, sand and gravel), oil and gas, and geothermal resources that would be of value to the region and residents of the State.

EIR

The mineral resources impact analysis should focus on the **potential loss of availability of the mineral resource due to land use conversions**. Loss of access to mineral

resources would primarily be the result of conversion of lands underlain by these resources to other uses, or within close proximity to the resources, such that the construction and occupancy of the project would restrict or eliminate safe and environmentally sound measures to implement extractive operations. **Loss of access could also be the result of changes in land ownership** (e.g., non-renewal of a lease where active mining is occurring). Loss of access to mineral resources for the purposes of future extraction could be considered to be primarily an economic issue. According to CEQA Guidelines Section 15131(a)

Standards of Significance
Would the project; Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?

Result in the loss of availability of a locally-important **"mineral resource"** recovery site delineated on a local general plan, specific plan, or other land use plan?
3.3.15-3

Yet, to comply with the Mining Laws the DFG will most certainly have to allow the miner to do individual mitigation in many circumstances for special uses. This is of coarse something the DFG seems completely oblivious to since they believe that they have discretion to deny, which of coarse they do not.

The only locatable mineral on the majority of unpatented placer claims held under federal law is placer gold, which is naturally concentrated in stream or river bed gravels, and usually no where else in worthwhile amounts. The only economically viable means to profitably recover placer gold in stream or river gravel is by "suction dredge minng".

Accordingly, suction dredging is the **"Highest & Best Use"** of river placer mining claims. As a matter of fact, it is only viable use, as no other mining method is practical, economical, profitable or environmentally sound.

When the only viable use of an unpatented placer mining claim is by suction dredging, arbitrarily prohibiting that use (even temporarily) effects a complete "taking" of all economic benefit the owner could derive from it, for the duration of the ban.

The **Fifth Amendment to the United States Constitution**, made applicable to state and local governments by the Fourteenth Amendment, prohibits the government from taking private property for public use without just compensation.

The California Constitution provides, "Private property may be taken or damaged for public use only when just compensation ... has first been paid to, or into court for, the owner." (Cal. Const., art. I, § 19.)

It is well established that just compensation… is the full value of the property taken at the time of the taking, plus interest from the date of taking. United States v. Blankinship, 9 Cir., 1976, 543 F.2d 1272, 1275.

Without doubt, S.B. 670 capriciously deprives thousands of families of their legitimate livelihood, and caused an immediate gross compensatory "taking" of valid existing rights, and compensable private property interests of considerable magnitude.

California Liability

The Treasury of the State of California will ultimately be held liable to pay compensable damages to all those effected, accruing from August 6th 2009 forward. Until at least the illegal ban on suction dredging unpatented placer mining claims is lifted, or if necessary overturned by appropriate federal court action.

Federal mining claims are "**private property**" Freese v. United States, 639 F.2d 754, 757, 226 Ct.Cl. 252 cert. denied, 454 U.S. 827, 102 S.Ct. 119, 70 L.Ed.2d 103 (1981); Oil Shale Corp. v. Morton, 370 F.Supp. 108, 124 (D.Colo. 1973).

This **possessory interest** entitles the claimant to "the right to extract all minerals from the claim without paying royalties to the United States." Swanson v. Babbitt, 3 F.3d 1348, 1350 (9th Cir. 19930).

16 U.S.C. § 481, Use of Waters: **All waters within boundaries of national forests may be used for domestic, mining**, milling, or irrigation purposes under the laws of the state wherein such national forests are situated or under the laws of the United States and the rules and regulations established thereunder.

"Uncompensated divestment" of a valid unpatented mining claim would **violate the Constitution.** Freese v. United States, 639 F.2d 754, 757, 226 Ct.Cl. 252, cert. denied, 454 U.S. 827, 102 S.Ct. 119, 70 L.Ed. 2d 103 (1981).

Even though title to the fee estate remains in the United States, these unpatented mining claims are themselves **property protected by the Fifth Amendment** against uncompensated takings. See Best v. Humboldt Placer Mining Co., 371 U.S. 334 (1963); cf. Forbes v. Gracey, 94 U.S. 762, 766 (1876); U.S.C.A.Const. Amend. 5; North American Transportation & Trading Co. v. U.S., 1918, 53 Ct.Cl. 424, affirmed 40 S.Ct. 518, 253 U.S. 330; United States v. Locke, 471 U.S. 84, 107, 105 S.Ct. 1785, 1799, 85

L.Ed. 2d 64 (1985); Freese v. United States, 639 F.2d 754, 757, 226 Ct.Cl. 252, cert. denied, 454 U.S. 827, 102 S.Ct. 119, 70 L.Ed. 2d 103 (1981); Rybachek v. United States, 23 Cl.Ct. 222 (1991).

A valid location, though unpatented, is a grant in the nature of an estate in fee and if such an estate is taken by the United States, **just compensation must be made**. See U.S.C.A. Const. Amend. 5, North American Transportation & Trading Co. v. U.S., 1918, 53 Ct.Cl. 424, affirmed 40 S.Ct. 518, 253 U.S. 330

Such an interest may be asserted against the United States as well as against third parties (see Best v. Humboldt Placer Mining Co., 371 U.S. 334, 336 (1963); Gwillim v. Donnellan, 115 U.S. 45, 50 (1885)) **and may not be taken from the claimant by the United States without due compensation.** See United States v. North American Transportation & Trading Co., 253 U.S. 330 (1920); cf. Best v. Humboldt Placer Mining Co.

However, showing potential for harm, and showing that actual harm exists are two different things, and the studies to date have not shown any actual effect on the environment by suction dredging except for those that are short-term and localized in nature.

Current regulatory efforts are proceeding despite this lack of evidence showing that harm to the environment is taking place. The regulatory agencies should be consistently and continually challenged by the dredging community to produce sound, scientific evidence that support their proposed regulations. **To regulate against a "potential for harm", where none has been shown to exist, is unjustifiable and must be challenged**.

State, Legislators and DFG Errors

The state courts fumbling the matter, ignoring the private property rights, unpatented mining claim owners do have.

The CA F&G doing flip flips whether or not the issuance of suction dredge permits is "ministerial" or not. Meaning, they either have no discretion, and must issue them, or discretion to not issue them.

The legislature finding SB 670 has no or negligible economic impact. When in fact the economic impact toll may reach $100 million dollars annually.

The legislature passing SB 670, premised on "findings" that will be made at some future date, which is laughable.

The legislature passing SB 670, as emergency legislation, where no emergency exists, which is unconscionable.

Public hearings going on, the results of which will certainly effect the private property rights of as many as 60,000 individual owners of unpatented mining claims in California, without any notice to them.

A state agency that has very little expertise in what it regulates, hiring a private firm, that clearly has no expertise in much of what it is being paid $1.5 million dollars to do.

A "temporary" ban on all suction dredge gold mining in California, that is "indefinite".

Private property being illegally taken, without just compensation being paid.
Not from one, but thousands of mining claim owners.

All in all here, we have an ever expanding comedy of bureaucratic bumbling.
The end of which is not yet in sight. Apparently, this is a perfect example of California "governance" at it's finest.

What becomes plain to anyone knowledgeable in the area of federal lands, and mining law, in reading, and trying to respond to this initial study report. Is that DFG themselves & the company that they contracted to compile, and perform the EIR, lack a basic understanding of fundamental law, and facts governing federal public domain & mining on it. In so far as the right to mine, on federal lands, on unpatented mining claims, is a federally protected private property right. Public Lands for People, et., al., immediately filed a lawsuit against the state of California, against numerous unlawful provisions of SB 670.

In the same span of time, CA DFG spends $1.5 million dollars hiring a ""water quality"" evaluation firm, to commence the state wide CEQA study. The firm presents CA DFG with an "Initial Study" report that is fundamentally flawed, because neither CA DFG or the firm have expertise, nor experience with federal land law, federal mining law, and associated private property rights conferred to owners of unpatented mining claims, where the vast majority of suction dredge gold mining takes place in California.

Notice of Preparation / Initial Study
Project No. 09.005

The environmental factors checked below would potentially be affected by this project (i.e., the project would involve at least one impact that is a "Potentially Significant Impact"), as indicated by the checklist on the following pages.

CHECK LIST

Aesthetics (checked)
Air Quality (checked)
Biological Resources (checked)
Cultural Resources (checked)
Hazards and Hazardous Materials (checked)
Hydrology/Water Quality (checked)
Noise (checked)
Recreation (checked)
Mandatory Findings of Significance (checked)
Mineral Resources (NOT CHECKED)
Signed, John McCamman, Chief Deputy Director 10/26/09

The Chief Deputy Director of DFG has made a knowingly deliberate, and utterly false official written statement here, by not checking **the "Mineral Resourse"** checklist box in this official CEQA initial study report. The consequence, of which might not seem readily apparent, nor even significant. However, I assure you, it is strikingly significant in several differing aspects involved here.

It is common knowledge, and utterly indisputable that gold, platinum, and other associated extremely valuable minerals are certainly **"Mineral Resources".**

It is common knowledge, and utterly indisputable that these valuable "**mineral resources"** certainly exist as placer deposits, within waterways throughout California.

It is common knowledge, and utterly indisputable that "suction dredging" is a widespread modern efficient small scale mining method throughout California.
Clearly, that is what triggered this CEQA study.

It is common knowledge, and utterly indisputable that small scale suction dredging is usually profitable. Otherwise, no prudent person would invest in a suction dredge, nor spend time performing arduous labor to do it and especially now with gold at over $1100 per ounce.

It is common knowledge, and utterly indisputable that relatively significant amounts of gold, and other valuable minerals are recovered by small scale suction dredging annually in California.

Given this indisputable series of facts. It is not possible by any stretch of imagination, or reality. That the Chief Deputy Director of CDFG, the very state agency that regulates all

suction dredge permitting statewide throughout California, could assert small scale "suction dredging" does not involve, nor have a potentially significant impact on "Mineral Resources" within California.

Doing so, clearly and profoundly impugns the Chief Deputy Directors professional credibility, as well as destroys the reliability and total integrity of the very CEQA study, he now directs. Why the head of public agency would make a deliberate false statement in an official state document, is by itself incredulous. So, giving him the benefit of doubt, that is sane, there must be some other devious factor behind him doing it.

The CEQA provisions impart are:

California Environmental Quality Act (CEQA) Guidelines Appendix G states that a project would have a significant impact on mineral resources if it would:

a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.

b. Result in the loss of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

Which would be arbitrary, capricious, an abuse of discretion or otherwise not in accordance with law, any way it might appear in CEQA documents.

If any public funds are expended, for costs involved in public meetings, or any proceeding, or study, that is not based on sound legal footing, and at any later date, any such meeting, proceeding or study is required by law to be repeated in full conformity with all applicable law. Duplicate spending to cover what should have been done right, the first time, is a total waste. For which someone must be held responsible.

Given the obvious conundrum there, the issue is then further complicated by the California legislature, without an Attorney Generals legal opinion, whether or not SB 670 is legal. The legislature pass's SB 670, which prohibits all suction dredging state wide until both state court orders are complied with, a state wide CEQA study is performed, and any new suction dredging regulations, if needed, are implemented.

In so far as the right to mine, on federal lands, on unpatented mining claims, is a federally protected private property right. Public Lands for People, et., al., immediately filed a lawsuit against the state of California, against numerous unlawful provisions of SB 670.

The Administrative Procedure Act (APA) establishes rulemaking procedures and standards for state agencies in California. The requirements set forth in the APA are designed to provide the public with a meaningful opportunity to participate in the adoption of state regulations and to ensure that regulations are clear, necessary and legally valid. The APA is found in the California Government Code, section 11340 et seq. State regulations must also be adopted in compliance with regulations adopted by OAL (see California Code of Regulations, Title 1, sections 1-280).

11342.510. Unless the provision or context otherwise requires, the definitions in this article govern the construction of this chapter. 11342.520. "Agency" means state agency.

11342.535. "Cost impact" means the amount of reasonable range of direct costs, or a description of the type and extent of direct costs, that a representative private person or business necessarily incurs in reasonable compliance with the proposed action.

11342.580. "Plain English" means language that satisfies the standard of clarity provided in Section 11349.

Regulatory Notice Register.

11342.600. "Regulation" means every rule, regulation, order, or standard of general application or the amendment, supplement, or revision of any rule, regulation, order, or standard adopted by any state agency to implement, interpret, or make specific the law enforced or administered by it, or to govern its procedure.

11342.610. (a) "Small business" means a business activity in agriculture, general construction, special trade construction, retail trade, wholesale trade, services, transportation and warehousing, manufacturing, generation and transmission of electric power, or a health care facility, unless excluded in subdivision (b), that is both of the following:

(1) Independently owned and operated.

(2) Not dominant in its field of operation.

CONCLUSIONS

In this document, we have shown how the Mineral Estate Grantees have clear and distinct rights unlike any other user of the public lands. We have shown how the **Mineral Estate Grantees have "Real Property"** under the highest sense of such terms. We have shown how the State of California's attempt to prohibit instead of to regulate suction dredge mining is based on totally flawed or unsound "science" (and we use that term loosely –

there is no "science"). We have shown how The State of California has no authority to supersede Federal Law. We have shown how mining activities under the U.S. Mining Acts are "non-discretionary" activities, and as such do not fall under the purview of the ESA, or for that matter the CWA, or even NEPA, or CEQA. We have shown how the proposed prohibition will constitute a "taking" of the Mineral Estate Grantees Property, and lastly, we have shown how it is the continuing intent of the U.S. Congress to "foster and encourage" mineral development. This whole thing could have been avoided by the state of California if they had just attempted, in good faith, to work within the law and work with the miners to come up with some reasonable regulations. For well over 4 years the negotiations, court cases and legislative Bills have been going on and the miners and prospectors are well aware that the process is coming to an end. This is the last chance for their plea's to be heard by the State of California. The Departmental Bureaucracy has worn all of the participants down to a point were patience is thin . . . but this does not mean the State of California has the final word, yet.

The Mineral Estate Grantee's and prospectors are still positive in their position, still looking to make the American System work as it should. They have rights granted to them, and up to this point, those rights have been violated because the American System is failing because of violations of the law by the State of California. There is still one more step in the process to insure that the American System will work for the people.

Suction dredge gold mining is the only practical, economical and environmentally sound method to recover small scale placer gold deposits in rivers and gravels within California.

If a state agency is unable, fails to, or ignores "reality", they clearly lack a basis of sound judgment to formulate practical, suitable, and fair regulation of anything. As resulting regulations could, and likely would be impractical, leading to confusion, consternation, and protracted costly litigation to clarify such arbitrary, or capricious regulation. None of which is in the regulating agency, or publics best interest.

PLP and their members and member organizations feel compelled to put the State of California on notice that we must be guided back in the right direction or be responsible for the real possibility of imminent harm and Takings Claims under the 5th and 14th Amendments to the U.S. Constitution, violations of California State Laws and violations Federal Law on the this issue.

RECOMMENDATIONS: We strongly suggest that in order for the State of California and the Agencies to avoid many costly takings lawsuits that they discard the proposed prohibitions, go back to "good faith" meetings with the miners and

using good sound verifiable science draft regulations that protect the environment as much as possible without materially hindering or interfering with the lawful mining activities of the Mineral Estate Grantees.

Notice is given

I hereby officially request DFG's unlawful actions cease and desist immediately. Failure to do so could subject the Director to personal suit for damages and those individuals acting in concert. The Director may also be subject to prosecution by the Dept. of Justice for Violations of the Hobbs Act (18 U.S.C. 1951), which states in part:

"(a) Whoever in any way or degree obstructs, delays, or affects commerce or the movement of any article or commodity in commerce, by robbery or extortion or attempts or conspires so to do, or commits or threatens physical violence to any person or property in furtherance of a plan or purpose to do anything in violation of this section shall be fined under this title or imprisoned not more than twenty years, or both.

(b) As used in this section--

(1) The term "robbery" means the unlawful taking or obtaining of personal property from the person or in the presence of another, against his will, by means of actual or threatened force, or violence, or fear of injury, immediate or future, to his person or property, or property in his custody or possession, or the person or property of a relative or member of his family or of anyone in his company at the time of the taking or obtaining.

(2) The term "extortion" means the obtaining of property from another, with his consent, induced by wrongful use of actual or threatened force, violence, or fear, or under color of official right." Emphasis added

(3) Makes or uses any false writing or document knowing the same to contain any materially false, fictitious, or fraudulent statement or entry; shall be fined under this title, or imprisoned for not more than 5 years.

Respectfully Submitted

Gerald Hobbs

Gerald Hobbs
President PLP

KONOPACKY
ENVIRONMENTAL

Effects of Recreational Suction Dredge Operations on Fish and Fish Habitat: A Literature Review in Association with a Petition of the Idaho Gold Prospectors Association to the Idaho Land Board

Final Report - 1996
Konopacky Project No. 064-0

Prepared for:
Idaho Gold Prospectors Association
Boise, Idaho 83709

Prepared by:
Konopacky Environmental
Meridian, Idaho 83642-6238

July 9, 1996

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July 9, 1996

2.0 STUDY AREA

2.1 Location of Streams/Rivers in Reviewed Literature

Relative to the reviewed publications and other literature for this report, the study area included all streams and rivers noted in reports that addressed the effects of recreational mining on fish and/or fish habitat. Most, if not all, streams noted in the literature reviewed for this report contained one or more salmonid species.

2.2 Location of IGPA-Petitioned Reach of the Boise River

Per the most recent petition of the IGPA (1996), the reach requested for entry is the approximately 27.7 contiguous miles of the Boise River and Middle Fork of the Boise River upstream of Arrowrock Dam reservoir (Figure 1). The confluence of Middle and North forks of the Boise River form the Boise River proper.

Fish species present in the above-noted reach of the Boise River system include rainbow/redband trout *Oncorhynchus mykiss*, cutthroat trout *O. clarki*, bull trout *Salvelinus confluentus*, brook trout *S. fontinalis*, and mountain whitefish *Prosopium williamsoni* (Idaho Department of Fish and Game, pers. comm., June 20, 1996). The bull trout is presently a candidate for listing as a federal endangered species.

Two types of fishing regulations occur in the 27.7-mile long reach of the Boise River requested for entry by the IGPA (Idaho Department of Fish and Game 1996). General fishing regulations are in effect from Arrowrock Dam, including the reservoir, to the confluence of the North and Middle Forks of the Boise River (Figure 1). General regulations for the reach include being open to some form of fishing all year, except for April and part of May, and daily bag limits of up to sixteen trout (e.g., six rainbow trout and ten brook trout), fifty whitefish, and no bull trout. Special or more restrictive fishing regulations are in effect from the confluence of the North and Middle Forks of the Boise River to the upstream end of the above-noted 27.7-mile reach of river. Special regulations include a daily bag limit of two trout, in aggregate (i.e., all species of trout and salmon present), neither of which may be less than fourteen inches long, fifty whitefish, and no bull trout. Only artificial flies and lures with one barbless hook per fly or lure may be used in the reach (i.e., no bait). Trout season runs from the May 25 through November 30 during 1996 while the whitefish seasons runs from January 1 through March 31 and from May 25 through December 31 during 1996. Seasons vary on a bi-yearly basis.

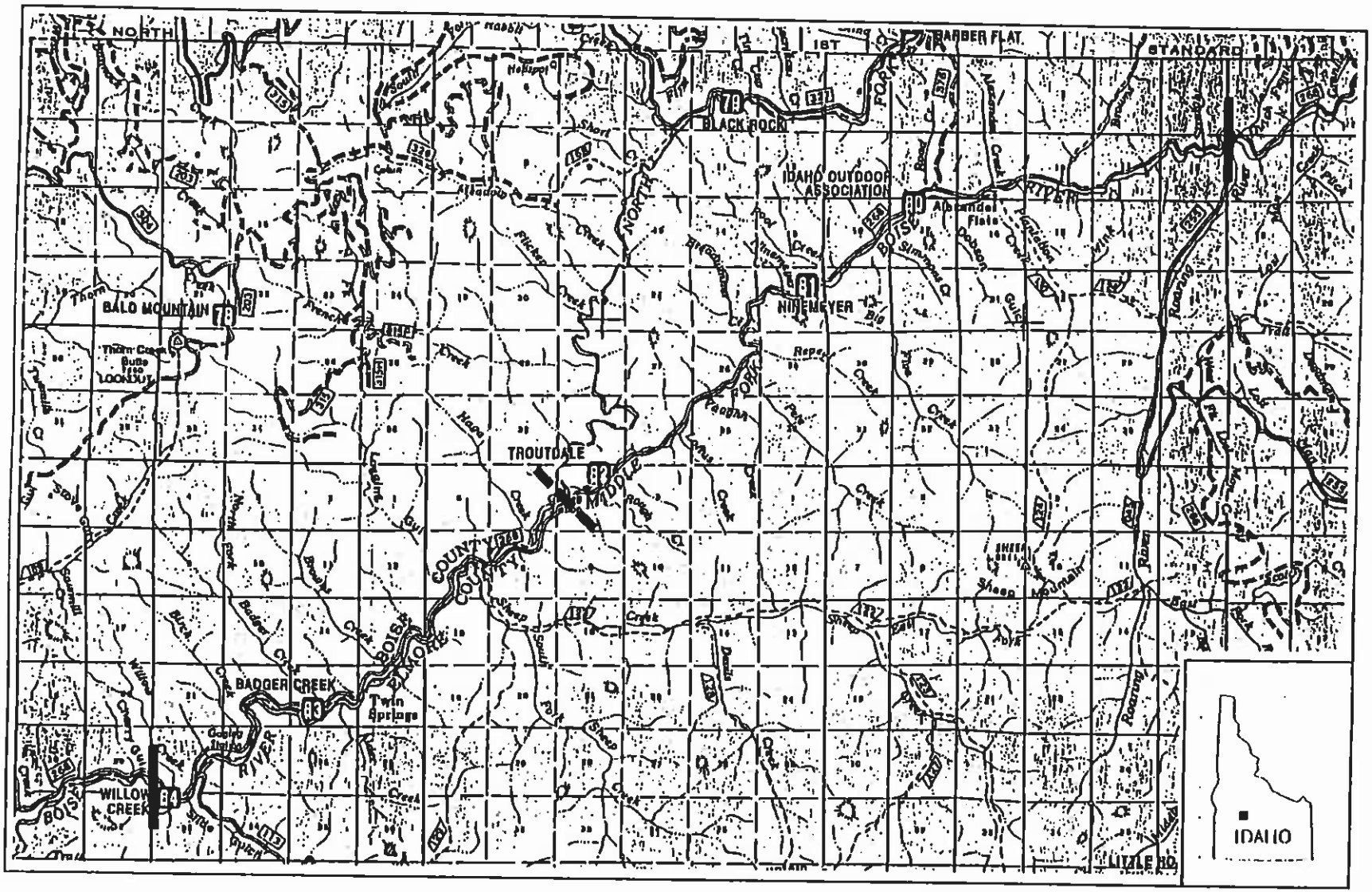

Figure 1. Location of 27.7-mile reach of the Boise River petitioned for mineral entry by the IGPA. Dotted line at the confluence of the North-Middle forks connotes the location of the change from general (downstream) to restricted (upstream) fishing regulations. In diameter. Scale: 1 inch=approximately 2.25 miles.

3.0 METHODS

Available published and unpublished literature on the effects of recreational mining, primarily with small (i.e., ≤4-in diameter) suction dredges (Figure 2), in streams was collected from various sources. Articles that assessed effects of mining with 4-in and larger suction dredges and large or heavy dredge-mining (e.g., Casey and Webb 1960; Morrow 1971; Throop and Smith 1986) were reviewed but not included in the analysis although some investigators reported no adverse effects from some commercial operations. Additional information (e.g., U.S. Army Corps of Engineers Permit) was also collected and reviewed given that such permits would be required from a federal agency for proposed in-stream activities in navigable streams. All reviewed articles primarily dealt with interactions between recreational mining and components of salmonid streams although some publications differentiated between responses by salmonids and other non-game fish species. Gathered information was divided into the following potentially affected components in a stream system: fish (i.e., eggs/embryos, fry/juveniles, adult fish), habitat, and aquatic macroinvertebrates. Comments by fish management agencies, states, and the federal government on aspects or recreational suction-dredging were also included in this report although no effort was made to list the regulations that pertained to recreational mining per state; such listing are found in North (1993) and Harvey et al. (1995) Other sources of fish mortality were addressed in the discussion section.

4.0 RESULTS

4.1 EFFECTS OF RECREATIONAL SUCTION-DREDGE MINING ON FISH

4.1.1 Mortality of Salmonid Eggs and Deposited Embryos

Four investigators reported the operation of small recreational-type suction dredges had negative effects on eggs and deposited embryos. In an Idaho Fish and Game-funded study, Griffith and Andrews (1981) reported that 100 percent of un-eyed cutthroat trout *Oncorhynchus clarki* eggs died within 1 hr of entrainment in a 3-in diameter suction dredge. In the same study, eyed cutthroat trout eggs had mean mortality rates of 29 percent and 35 percent at the end of 1-hr and 36-hr periods, respectively. Eyed eggs of hatchery rainbow trout *O. mykiss* experienced a 19 percent mortality rate after entrainment and at the end of a 10-day period; control eggs experienced an 18 percent mortality rate over the same time period.

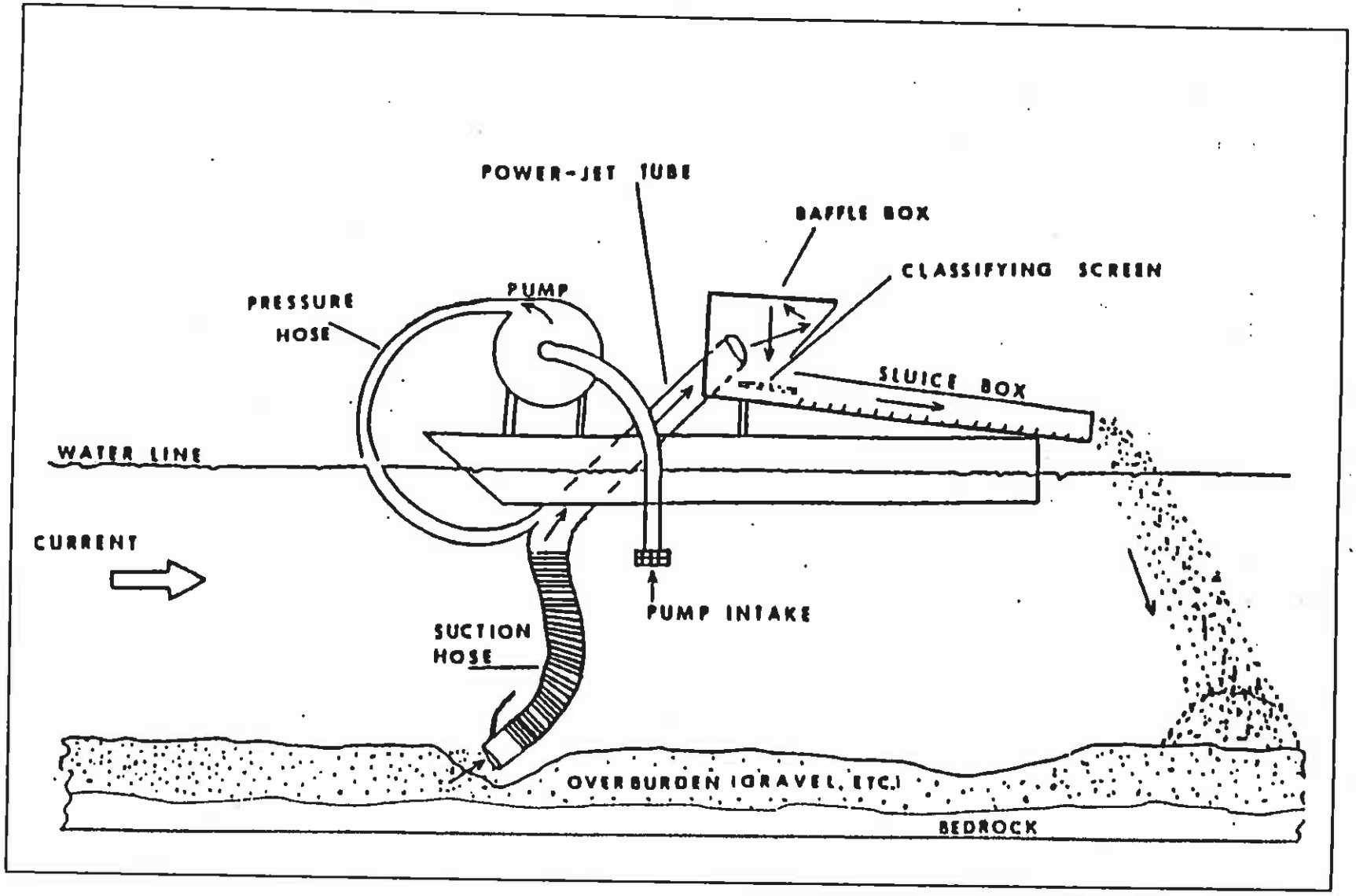

Figure 2. Cross-sectional view of a typical power-jet suction dredge used in recreational mining for gold. As proposed by the IGPA petition, the suction dredge intake nozzle (i.e., arrow from overburden into suction hose) would be ≤3 inches in diameter.

4.1.2 Mortality of Salmonid Sac-Fry

In an Idaho Fish and Game-funded study, Griffith and Andrews (1981) reported hatchery rainbow sac-fry experienced an 83 percent mortality rate after entrainment and a 20-day monitoring period; control fish experienced a 9 percent mortality rate over the same period. Yolk sacs were detached from approximately 40 percent of the fry during entrainment.

4.1.3 Behavior of Salmonid Adults

Operation of small suction dredges did not affect the density or movement of adult rainbow trout in the North Fork of the American River, California. Harvey (1986) reported the density of trout in downstream dredged pool-riffle sequence averaged 22.9 fish while the upstream control sequences contained 25.5 fish. In the same study, tagged rainbow trout moved very little in the control or dredged area. No tagged fish moved farther than from a pool to one of the adjacent riffles or vice versa over the two-week test period. Harvey (1986) also reported that, during low flows in late summer, eight rainbow trout moved from a nearby riffle to occupy a dredge-created pool in a stream and that dredge operation in pools did not displace trout in the same pools. Stern (1988) reported that holding locations of adult spring-run chinook salmon and adult summer-run steelhead were not affected by dredge-mining operations (i.e., 2,211 m^2 of stream bed) in Canyon Creek, a California stream, from the previous two years. North (1993) reviewed four published articles and four unpublished articles on suction dredge mining and concluded that dredging did not directly affect free-swimming fish. Harvey et al. (1995) reported the use of suction dredge tailings for spawning purposes by chinook and coho salmon.

4.1.4 Behavior of Non-Salmonids

Operation of small suction dredges altered the abundance of riffle sculpins *Cottus gulosus* in the North Fork of the American River, California. Harvey (1986) reported that significantly (i.e., $P \leq 0.05$) fewer sculpins were found under test rocks that offered no cover or some cover one month after dredging operations in the stream.

4.2 EFFECTS OF RECREATIONAL SUCTION-DREDGE MINING ON FISH HABITAT

4.2.1 Turbidity or Suspended Sediment in Water Column

Four studies quantified the local effects on water turbidity that resulted from the operation of recreation gold dredges in salmonid streams. Harvey (1986) reported an increase from 4-5

nephelometric turbidity units (NTUs) to 25-30 NTUs during and after dredging in the localized plume area downstream of the activity. He also reported active feeding by rainbow trout in the stream at the 25-30 NTU level. Thomas (1985) used a 2.5-in diameter suction dredge to disturb, from bank to bank, a 10-m (i.e., 33 ft) long reach of a Montana stream. She established an upstream 10-m long control reach and three 10-m long downstream response reaches. She reported that suspended sediment levels returned to ambient levels 30.5 m (i.e., 100 ft) downstream of the dredged reach. She also estimated that the bulk of the sediments, put into suspension by the dredge, was re-deposited within 6 to 11 m (i.e., 20 to 36 ft) downstream of the dredge. In comparisons with control sites, Stern (1988) reported very minor increases in turbidity (i.e., 1.58 to 1.98 NTUs) at sites 10 m downstream of dredges in Canyon Creek, California; increases declined further (i.e., 0.04 to 0.20 NTU) at sites 100 m downstream of dredges. Somer and Hassler (1992) reported very little variation in water turbidity upstream and downstream of reaches dredged by professional miners in two California streams. They reported turbidity levels exceeded 15 NTUs only near the dredge outfall. North (1993) reviewed four published articles and four unpublished articles on suction dredge mining and concluded that dredging affected turbidity temporarily but only in the immediate vicinity of the dredge.

4.2.2 Deposited Sediment on Stream Bottom

Two studies quantified the change in deposited sediments, downstream of a small dredge operation in a salmonid stream. Thomas (1985) reported that ambient sediment deposition levels (i.e., 86 $g/m^2/day$) increased 10 to 20 times over background levels immediately downstream of a 10-m long stream reach that was dredged from bank to bank. Deposited sediment decreased exponentially with distance downstream of the dredged reach. Somer and Hassler (1992) reported that fine sediment or organic matter weights did not differ significantly (i.e., $P>0.05$) in artificial substrate samplers retrieved, after 2, 4, and 6 weeks, in reaches, from reaches upstream and downstream of reaches dredged by professional miners in two California streams. The samplers were placed into the streams on August 31-September 1 or near the midpoint of a August 3 through October 4 dredging effort. Somer and Hassler (1992) reported different daily sedimentation rates from reaches upstream and downstream of reaches dredged by professional miners in two California streams. They reported lower sedimentation rates in a reach downstream (i.e., 12 $g/m^2/day$) versus upstream (i.e., 13 $g/m^2/day$) of dredging in Canyon Creek. In contrast, they reported higher sedimentation rates in a reaches downstream (i.e., 1,711 $g/m^2/day$ at 40 m and 698 $g/m^2/day$ at 113 m) versus upstream (i.e., 29 $g/m^2/day$ at 100 m and 23 $g/m^2/day$ at 50 m) of dredging in the Big East Fork Creek. Dredge operations excavated below the gravel armor level and into a fine sand and silt layer that comprised most of the transported sediments.

4.2.3 Changes in Gravel Permeability

One reviewed study reported on the change in gravel permeability after dredging in a salmonid stream. Thomas (1985) reported that gravel permeability (i.e., volume of moving water through an orifice) increased in the dredged area of a Montana stream while no changes were detected upstream or downstream of the dredged section. She concluded that silt deposition from suction dredging should not be detrimental to the development of salmonid eggs.

4.2.4 Physical Changes in Habitat

Harvey (1986) reported the basic pattern of physical change caused by small dredge operations was the formation of a hole in the stream bottom where dredging had occurred and the build-up of shallow sand-gravel areas downstream. Piles of large cobbles and boulders, too large to fit through the dredge, were also created by the dredge operator. Thomas (1985) stated that "pocket and pile" dredging techniques had a greater impact on stream channel morphology than dredging to a uniform shallow depth. She returned to two dredged sites after one year and could not determine where dredging had occurred in one site but could still detect the cobble-boulder pile at the second site. She concluded that a suction dredge could make "highly localized" changes in channel morphology. Similarly, Stern (1988) reported that flows in Canyon Creek, an anadromous fish stream in California, effectively obliterated instream mining disturbances from the previous season (i.e., 1,136 m^2 or 12,229 ft^2 of stream-bed). McCleneghan and Johnson (1983) investigated 235 dredge mine operations in California and reported that: 1) 176 operations met all regulations; 2) 14 operations were undercutting banks; 3) 1 operation was sluicing the bank; 4) 12 operations were channelizing the stream; 5) 7 operations were causing riparian damage; and 6) 25 operators were camping in the riparian zone. More important to the interpretation of their finding, they noted that: 1) some operators were in violation of more than one regulation; 2) their observations included some commercial placer-dredge operations; 3) 67 percent of the suction dredge operations used dredges with intakes of 4 to 10-in diameters; and 5) 53 percent of the miners were classified as professional versus recreational. Across all miners and operations, they reported that all state regulations were followed 88 percent of the time. North (1993) reviewed four published articles and four unpublished articles on suction dredge mining and concluded that dredging changed stream morphometry for a short period that lasted until the next high flow.

4.3 EFFECTS OF RECREATIONAL SUCTION-DREDGE MINING ON AQUATIC MACROINVERTEBRATES

4.3.1 Death, Injury, or Displacement of Invertebrates

Three investigators reported almost negligible negative effects to aquatic macroinvertebrates from entrainment on and passage through a recreational-type suction dredge. In an Idaho Fish and Game-funded study, Griffith and Andrews (1981) reported that less than 1 percent (i.e., 26) of the 3,623 invertebrates, entrained in a 3-in diameter suction dredge, showed injury or died within 24-hrs. Thomas (1985) reported significantly ($P<0.05$) fewer aquatic insects in a 10-m long reach of stream that is dredged from bank to bank than in 10-m long reaches just upstream and just downstream of the dredged reach. Somer and Hassler (1992) reported that aquatic invertebrate numbers did not differ significantly (i.e., $P>0.05$) in artificial substrate samplers retrieved, after 2, 4, and 6 weeks, in reaches, from reaches upstream and downstream of reaches dredged by professional miners in two California streams. The samplers were placed into the streams on August 31-September 1 or near the midpoint of a August 3 through October 4 dredging effort.

4.3.2 Invertebrate Diversity and Equitability

One study reported on the changes in diversity (i.e., number but not kind of species present in a sample) and equitability (i.e., evenness of the allotment of individuals among the taxa present) within invertebrate communities upstream and downstream of dredged sections of two streams in California. Somer and Hassler (1992) reported that aquatic invertebrate diversity and equitability did not differ significantly in artificial substrate samplers retrieved from stream sections upstream and downstream of a dredged sections.

4.3.3 Recolonization of Invertebrates

Three investigators reported a relatively fast recolonization rate of invertebrates following the use of a suction dredge in stream substrate. In an Idaho Fish and Game-funded study, Griffith and Andrews (1981) reported that most of the plots dredged in Summit Creek, a salmonid stream in Idaho, were completely recolonized 38 days after the dredge activity. Forty-five days after dredging with a 6-in diameter suction dredge, Harvey (1986) reported that the mean number of aquatic insects per sample in a recolonized area of Butte Creek, California did not differ significantly ($P>0.05$) from control stations. Thomas (1985) also reported that recolonization in a 10-m long stream reach, dredged from bank to bank, was essentially complete one month after dredging. She also reported that the number of insects in the dredged reach

increased one month after dredging even when insect numbers in the upstream control and downstream impact reached had decreased; she concluded that most aquatic insects found the dredged areas were suitable habitat.

4.4 RESOURCE AGENCY COMMENTS/REGULATIONS ON THE OPERATION OF RECREATIONAL SUCTION DREDGES IN STREAMS

4.4.1 U.S. Army Corps of Engineers

Under Section 404 of the federal Clean Water Act, the U.S. Army Corps of Engineers regulates, via a permit process, the discharge of dredged or fill material into waters of the United States. The Corps (1996) recently clarified its position on the Excavation Rule as it related, in particular, to recreational dredging for gold in waters of the United States. In the special notice, the Corps defined those activities that they "determined to have *de minimis* impacts", "obvious low levels of impacts", and "inconsequential effects on aquatic resources." Within the clarification notice, the Corps defined "very small operations" as having "suction hoses ≤3 inches in diameter by which very small amounts of material can be moved, clearly *de minimis*. Such equipment is used where overburden is shallow and access to cracks and crevices in bedrock is easy. About ten percent of the operators (i.e., recreational) use this kind of equipment exclusively and we currently consider them to be excepted from permit requirements." The Corps then listed conditions under which excepted gold dredging activities are subject to suspension (e.g., work is conducted in a wetland).

In a related action, the Corps (Pers. comm., August 4, 1995) reviewed an application of a recreational gold miner from Oregon who proposed to use a suction dredge with a 4-in or less intake line and an engine of 10 horsepower or less on an occasional, weekend, or vacation basis. The Corps concluded that the proposed activity fell within the "intended definition of *de minimus* and that the proposed activity did not require a permit as long as the proposed activity was conducted within the exemption guidelines.

4.4.2 U.S. Forest Service

The authority for exploration, development, and removal of gold on public lands, whether by suction dredging or other methods, is the General Mining Law of 1872. Most National Forest land in the western United States are open to 1872 Mining Law activities although some local areas are withdrawn for specific reasons (e.g., wilderness areas). In a notice to U.S. Forest Service (USFS) Supervisors, Regional Foresters (Pers. comm., February 5, 1995) from USFS Regions 5 and 6 stated that the majority of the "small placer operations using suction dredges and

similar equipment in Riparian Reserves and Late Successional Reserves throughout (USFS) Regions 5 and 6...are carried out under a Notice of Intention to Operate (NOI) because of the insignificant nature of their operation." The notice differentiated between recreational suction dredge mining and larger operations that involved the "cutting of trees or the use of mechanized earth moving equipment such as bulldozers or backhoes". Such larger operations would require the submission of a proposed plan of operations because of the pre-determined likelihood of a significant disturbance to surface resources.

Harvey et al. (1995) reiterated the above comments and added that a suction-dredge proponent would also be required to submit a Plan of Operations if the Forest Service determined the proposed disturbance was significant. All operations are to minimize adverse environmental impacts and the Forest Service can require mitigation measures, bonding, and reclamation when they determine that a Plan of Operations is required for a proposed suction dredge project.

In a letter to the Idaho Gold Prospectors Club, the U.S. Forest Service-Boise national Forest (Pers. comm., February 17, 1993; Appendix A) stated that the Boise National Forest had "a very good working relationship with you (i.e., Ron Mackelprang, President IGPA) and the Idaho Gold Prospectors Club. In fact, we have documented no cases of environmental damage due to recreational mining in or near the Middle Fork Boise River. Your group has worked hard to pick up litter and (develop) other partnership efforts with the Forest." The U.S. Forest Service concluded the letter by stating that "(w)e look forward to working with you this summer on several mutual projects."

4.4.3 Idaho Department of Fish and Game

In a letter to the Idaho Gold Prospectors Club, the Idaho Department of Fish and Game (Pers. comm., July 31, 1992; Appendix A) stated that "with regards to the Middle Fork of the Boise (River), recreation type dredging could take place during July and August without seriously impacting fish production. However, the State Land Board has removed the bed of the Middle Fork of the Boise River from mineral entry. The Board did <u>not</u> make that decision on biological information provided by the Idaho Department of Fish and Game" (emphasis added).

4.4.3 Idaho Department of Water Resources

All recreational and commercial dredge mining is presently regulated by the Idaho Department of Water Resources within one of two formats. Some recreational mining is permitted under a "one-stop" recreational permit which includes a list of state-federal agency pre-approved streams together with appropriate seasons and rules for dredge-miners that operate for

45 days or less per year with recreational equipment (Appendix B). All recreational and commercial dredge mining, that cannot meet the conditions of the "one-stop" recreational permit, must submit a more detailed "long-form" permit which contains more rules and detailed reviews by all involved state and federal agencies (Appendix B). Additional U.S. Forest Service permits (i.e., notice-of-intent, plan of operation) are also required, in all cases on national forest land, regardless of the Idaho Department of Water Resources permit.

4.4.5 California Department of Fish and Game

The California Department of Fish and Game (1994) completed an Environmental Impact Report that examined the effects of unregulated suction dredging on all aspects of the aquatic environmental which included stream beds and banks as well as riparian areas. All negative effects noted in this report above were also noted in the California report. As trustee for the fish and wildlife resources in the state of California, the Department concluded that "suction dredge mining can potentially result in the loss of this production, temporary loss of benthic/invertebrate communities, localized disturbance to stream beds, increased turbidity of water in streams and rivers, and mortality to aquatic plant and animal communities. However, based on the best available data (i.e., same data base as this report through April 1994), it is anticipated the project to adopt regulations for suction dredging as proposed, will reduce these effects to the environment to less than significant levels and no deleterious effects to fish." Proposed regulations (Appendix B) were intended to result in the maintenance of healthy lake, stream, and river systems while allowing for suction dredge mining in the state. Proposed regulations were consistent with state wildlife conservation and aquatic resource policies. To further ensure the maintenance of health in the aquatic systems in the state, the California Fish and Game Department would periodically review and amend regulations based on additional evidence and data. Lastly, the Department noted that "suction dredging is considered a legitimate activity on California's rivers and suction dredge operators have as much right as any other river user to enjoy and utilize rivers as long as their activities are within the laws and regulations of the State of California."

5.0 DISCUSSION

5.1 IMPACTS OF UNREGULATED RECREATIONAL SUCTION DREDGE-MINING ON FISH, HABITAT, AND AQUATIC MACROINVERTEBRATES

In general, almost all published and unpublished studies of unregulated suction dredge mining for gold in streams that were reviewed for this report identified some effect on fish,

habitat, and/or macroinvertebrates (i.e., fish food) in the study streams. Magnitude of impact ranged from non-detectable or even possibly positive (i.e., use of created pools for cover and cleaned tailings for spawning) to extremely negative (i.e., 100 percent mortality of uneyed cutthroat trout eggs). Across all types of impacts and excluding positive impacts and those impacts which would not occur under the present IGPA (1996) petition (i.e., no mining during incubation periods of resident or anadromous salmonids), most negative impacts were non-detectable to intermediate in size. Most of the larger negative impacts reviewed in this study were the result of violations of existing regulations that controlled the activity in a California study (McCleneghan and Johnson 1983) or were intentional at the laboratory level of study (Griffith and Andrews 1981). Relative to the California study, McCleneghan and Johnson (1983) found that most (i.e., 88 percent) of the observed recreational and professional suction dredge operators (i.e., 1-in to 10-in diameter) were mining within state regulations and that only a few operators were causing adverse impacts. Such impacts possibly to probably also occur in other states within which no regulations are in place for the activity. Most physical impacts (i.e., turbidity changes, reconfiguration of stream bottom) also occurred naturally (i.e., short to long-term storm events) and/or on a recurring basis but especially during annual spring run-off season. Regardless of the minimal nature of most impacts, however, the additional use of the stream resource by a suction dredge operator will produce some level of real or perceived change or impact as a result of the use of the stream for the activity. Some changes may not have a negative or deleterious effect on fish or fish habitat that is detectable other than at a human perception or visual level (e.g., turbidity, engine noise).

5.2 IMPACTS OF OTHER USER-GROUPS ON FISH, HABITAT, AND AQUATIC MACROINVERTEBRATES

5.2.1 Legal Fishing

The level of documented and undocumented negative effects on fish and fish habitat from other legal and regulated uses in the section of the Boise River petitioned for use by the IGPA (1996) is larger to much larger than the potential effect associated with their proposed activity. The Boise River is open to fishing by the general public throughout the petitioned 27.7-mile long reach of the Boise River and the Middle Fork of the Boise River during a majority of the year. By definition and allowed by State of Idaho regulations (Idaho Department of Fish and Game 1996), a single licensed fishermen in the reach can legally kill up to 16 trout per day (e.g., six rainbow trout and ten brook trout) over a 190 day season per year and 50 whitefish per day over a 312-day season (i.e., a single dedicated fisherman could legally kill up to 3,040 trout and 15,600 whitefish per year). If one assumed that one-half of the killed trout, in the above example, are female, that each female has 300 eggs, and that 5 percent of the eggs mature to at

least a catchable size (i.e., 6 inches), then one licensed fisherman could possibly account for the demise of additional 22,800 potential trout in one year. Similarly, the same fisherman could possibly account for the demise of additional 1,170,000 potential whitefish in the same year (i.e., same parameters as for trout except for 3,000 eggs per female). Konopacky Environmental could not find any documented case of a suction dredge killing an adult trout in any reviewed study or the unpublished literature.

In addition to actual killing of fish through harvest, another portion of the trout population in a stream can be unintentionally killed by fishermen. Even though a percentage of fish that are caught by fishermen are eventually released or escape during the time after initial hooking, a real mortality (i.e., range of 3 to 87 percent) is associated with catch-and-release fishing (Bouck and Ball 1966; Schill and Griffith 1986) that also exceeds any documented level of any mortality associated with suction dredge operation. Because there is no daily bag limit for the number of fish that can be caught and released in a stream reach, the potential mortality caused by one fisherman could be high and in addition to the mortality associated with the legal bag limit.

The IGPA-petitioned reach in the Boise River and Middle Fork of the Boise River is open to some form of fishing from January 1 through March 31 and from May 25 though December 31 during 1996 (Idaho Department of Fish and Game 1996). Various other non-commercial water-dependent activities, such as boating, kayaking, rafting, canoeing, and swimming are unrestricted and unregulated the entire year (USFS, pers. comm., July 9, 1996). As a result, fishermen and other periodic users/waders can potentially kill incubating embryos of all or some of the trout species present in the reach. Given that bull trout and brook trout are fall spawners and rainbow-redband trout and cutthroat trout are spring spawners, the simple act of walking/wading in the river can exert very large mortalities on incubating embryos over the entire IGPA-petitioned reach of the Boise River and the Middle Fork of the Boise River. Roberts and White (1992) reported that twice-daily wading on trout embryos and pre-emergent fry in redds killed up to 96 percent of the embryos and fry. A single wading killed up to 43 percent of the fish. With the exception of the intentional experiment of Griffith and Andrews (1981), Konopacky Environmental could find no published or unpublished documentation of any mortality of trout embryos or pre-emergent fry in natural stream systems from the regulated use of a suction dredge. The total combined impact of legal fish harvest, legal catch-and-release fishing, and legal wading use in a stream or river systems can potentially cause a substantial amount of mortality in trout populations in the systems.

5.2.2 Fish Management Activities

The Idaho Department of Fish and Game, in the past, has used electrofishing methods in the past to conduct inventories of fish populations within the IGPA-petitioned reach of the Boise River (Idaho Department of Fish and Game, pers. comm., June 20, 1996). Such activities, although legal and not completely necessary (i.e., other less intrusive methods such as diver-observation are available), were used by the agency to obtain data and information on the fish populations in the reach. Electrofishing does cause stress in fish through the electric shock and subsequent handling of the fish. Electrofishing can injure and kill trout embryos (Dwyer and Erdahl 1995) as well as juvenile and adult fish (Schreck 1976; Sharber and Carothers 1988). Other less intrusive but legal management activities (e.g., stocking of trout) can also have negative effects on wild trout populations through competition for food and space in the stream. Konopacky Environmental could find no published or unpublished documentation of cause-effect mortality of trout, in natural stream systems, from the regulated use of a suction dredge.

5.2.3 Road Maintenance, Agriculture, and Livestock Grazing

At least three other legal and regulated activities in the IGPA-petitioned reach of the Boise River have negatively impacted fish and fish habitat, in direct and indirect manners, for years. The large number of miles of maintained and non-maintained but unpaved roads contribute many tons of fine sediments to the stream via road use, wind, and periodic maintenance (i.e., winter plowing and summer grading). Although the roads are necessary for various uses, including fishing and hunting in the area, sediment contributions to the system can adversely affect fish embryos in redds (Tappel and Bjornn 1983), macroinvertebrate communities (McClelland 1972), and fish habitat (Bjornn et al. 1977). Although the action of a suction dredge may redistribute the fine sediments within the substrate of a stream system, a suction dredge or the operation of a suction dredge does not produce sediment or contribute sediment to a stream channel.

In addition to unpaved roads, regulated irrigation withdrawals and return flows as well as regulated agricultural and livestock uses in the IGPA-petitioned reach of the Boise River can have negative impacts on fish and fish habitat. Irrigation diversions in the IGPA-petitioned reach of the Boise River reduce the amount of water available for trout especially during the low-flow late-summer periods. Depending on the data base used, a total of 60 to 80 water rights or diversions of between 0.04 and 19.0 ft^3/sec exist in the 30 miles of river upstream of Arrowrock reservoir (Idaho Department of Water Resources, pers. comm., June 20, 1996). Return of used irrigation water unnaturally warms the water and adds sediment and possibly nutrients (e.g., fertilizer) to the water. Livestock grazing occurs on Boise National Forest lands adjacent to the IGPA-petitioned reach of the Boise River (Boise National Forest, pers. comm., June 20, 1996).

Cattle trailing and cattle/sheep in grazing allotments can negatively affect fish and fish habitat through trampling of fish embryos in redds in riffle crossing areas and the destruction of riparian vegetation through trailing and dispersed grazing. Although unregulated or illegal suction dredge use could add sediment to streams (e.g., mining of banks) and also impact embryos in redds, Konopacky Environmental could not find no published or unpublished account of the use of a suction dredge that heated stream water, added nutrients to stream water, added sediment to stream water, or destroyed riparian vegetation.

At least one state and one federal resource agency have stated that other regulated and legal uses in a stream drainage have a greater negative impact on fish and fish habitat than the operation of suction dredges by recreational miners. The California Department of Fish and Game (1994), after recognition of the long history of impacts to California rivers and streams associated with other recreational and commercial activities, concluded that the "cumulative detrimental effects of these activities are more significant to the overall health of fish and fish habitat than the impacts caused by suction dredging." Similarly, Harvey et al. (1995), in the development of a review and management strategy for suction dredging on U.S. Forest Service lands, conclude that "the scale of effects of individual dredges appears small, in contrast to other impacts affecting stream biota such as fishing, water diversions, road construction, and logging." Konopacky Environmental agrees with the two above agencies and suggests that regulated suction dredging can occur in a river system, such as the Boise River, with less impact on fish and fish habitat than other ongoing regulated and unregulated activities.

5.3 POTENTIAL IMPACTS OF REGULATED RECREATIONAL SUCTION DREDGE-MINING ON FISH, HABITAT, AND AQUATIC MACROINVERTEBRATES

The IGPA (1996) petition to use suction dredges to remove gold from a 27.7-mile reach of the Boise River system will have non-detectable to very minimal negative effects on fish and fish habitat in the Boise River system. The IGPA petition differs from most reviewed studies and would have such minimal effects because: 1) the petition already has "built-in" regulations (e.g., dredge season relative to incubation of fish embryos, ≤3-inch intakes); 2) the IGPA has informed the Board that the groups wishes to operate within a regulated format; 3) the IGPA has a documented history of self-imposed positive rules and aspects (e.g., litter patrols); and 4) the IGPA has good rapport with land management agencies (e.g., U.S. Forest Service). Such a limited effort in a limited reach of a river system can only have limited effects. Some of the limited effects probably occur naturally or are much smaller in magnitude than similar effects presently incurred by the fish and fish habitat by other legal and state-regulated activities within the Boise River system. In contrast, the California Fish and Game (1994) Environmental Impact Report stated that some positive effects of recreational gold mining with dredges included the

removal of lead, mercury, and other heavy metals with a concomitant increase in dissolved oxygen through the mechanical action of the dredge in the stream.

5.4 CONCLUSIONS

After our review of the published and unpublished literature on the effects of recreational suction dredge use on fish and fish habitat in the western United States, Konopacky Environmental makes the following conclusions: 1) impacts to fish and fish habitat from the regulated use of recreational suction dredges, in the IGPA-petitioned reach of Boise River upstream of Arrowrock Reservoir, will be non-detectable to minimal; 2) a non-detectable to large range of impacts to fish and fish habitat can occur with the unregulated use of recreational suction dredge in streams like the Boise River; and 3) other ongoing, legal, regulated and unregulated activities in the Boise River, in the reach upstream of Arrowrock Reservoir, will have larger detrimental or negative impacts to fish and fish habitat than the recreational use of suction dredges.

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APPENDIX A

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600 South Walnut
P.O. Box 25
Boise, ID 83707-0025

July 31, 1992

Mr. Ronald B. Mackelprang
Idaho Gold Prospectors Club
3522 Red Oak Drive
Boise, Idaho 83703

Dear Mr. Mackelprang:

I have received your letter of July 8, 1992 and have discussed the recreational dredging issue with Idaho Fish and Game (IDFG) Region 3 personnel and the Idaho Department of Water Resources (IDWR). As I mentioned at our meeting, recreational dredging will have an impact on eggs and juvenile fish in the substrate. We also become concerned with any activity which has the potential to cause accelerated erosion.

With regards to the Middle Fork of the Boise, recreation type dredging could take place during July and August without seriously impacting fish production. However, the State Land Board has removed the bed of the Middle Fork of the Boise River from mineral entry. The Board did not make that decision on biological information provided by the IDFG.

The IDFG initiated efforts to have the South Fork of the Salmon River and its tributaries removed from mineral entry. In areas with spawning potential, a salmonid life form is in the substrate at all times of the year. In addition, the IDFG does not believe it in the best interest of the fish to allow any type of activity which could pose a hazard to the recovery of salmon or steelhead.

If you have additional questions, please call me at 334-2598 or writing to 600 South Walnut, Boise, Idaho 83702.

Sincerely,

Will Reid
Fishery Program Coordinator

WR:kdd

cc: Director's Office
Region 3

Cecil D. Andrus / Governor
Jerry M. Conley / Director

Equal Opportunity Employer

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Department of Agriculture | Service | National Forest | 1750 Front Street Boise, ID 83702

Reply to: 2800

Date: February 17, 1993

Mr. Ron Mackelprang, President
Idaho Gold Prospectors Club
3522 Red Oak Drive
Boise, ID 83703

Dear Mr. Mackelprang:

We, on the Boise National Forest, have a very good working relationship with you and the Idaho Gold Prospectors Club. In fact, we have documented no cases of environmental damage due to recreational mining in or near the Middle Fork Boise River. Your group has worked hard to pick up litter and other partnership efforts with the forest.

The vast majority of toxic sediment in the Middle Fork Boise River bed remains behind the newly reconstructed Kirby Dam. Some sediment that did wash down river during the collapse is spread out on the bottom of the river between the dam site and the Weatherby Mill site. Mercury and arsenic attached to the sediment particles is not soluble in river water. The river water would have to be around pH 3 for the mercury and arsenic to go into solution. The river water is pH 6.5. This means the safety hazard to recreational miners is minimal.

If you have any questions, feel free to contact me at 364-4149 or Jim Curtis at 364-4136. We are looking forward to working with you this summer on several mutual projects.

Sincerely,

W. Wayne Patton

W. WAYNE PATTON

cc
W.Patton

SUCTION DREDGE FACTS

1a. Fish survival especially in times of drought is greatly enhanced by the presence of artifically created holes. (N. Am. J. Fish. Mgmt 14:37, 1994)
1b. Abandoned dredge holes provide holding and resting areas for fish.(M. S. Thesis, Humbolt St. U. 1988 by Stern)

2. Trout production was significantly increased by physically sculpting and altering the stream habitat. (Trans. Am. Fish Soc. 91:185)

3. Capacities of suction dredges in field conditions are only 2% of manufactures ratings. (N. Am. J. Fish. Mgmt. 1:21, 1981)

4. Capacities of suction dredges decrease by 4 times as the nozzle size decreases by 1/2. (N. Am. J. Fish. Mgmt. 1:21, 1981)

5. Suction dredges produce clean, de-silted gravels ideal for fish spawning. In addition, they break up the hardened river bottom substrate that prohibits aquatic life entry. Similiar to cultivating your garden. (Calif. Dept. F&G Memo Sept. 17, 1962, Suction Dredge Invest. by Lewis)

6a. Suction dredges remove heavy metals such as lead, mercury and arsenic compounds. (Final EIS, Ca. Dept. F&G, 4/94, p. 64, Adopt. Reg. for Suc. Dredges)
6b. Lead and mercury level in fish have been linked to lower reproduction rates. (Bull. Enviro. Contam. & Tox. Vols. 41, 43 pgs. 329, 858.)

7. Disturbed gravels are re-colonized by aquatic insects within 40 days, fewer than 1% showed injury or died after passing through the suction dredge. (N. Am. J. Fish. Mgmt. 1:21, 1981)

8. Dredges are being used by the Forest Service to remove silts from Idaho rivers. (Video Outdoor Idaho October 1992)

9. Dredges aerated the water and result in increased oxygen content down stream which oxidizes nutrients and increases water quality. (Beneficial effect never measured by researchers)

10. The effects of regulated suction dredge mining are insignificant:
(Final EIS, Ca. Dept. F&G, Apr. 1994, pg. 64, Adopt. of Reg. for Suction Dredges)
(B.C. Harvey, N. Am. J. Fish. Mgmt. 6:409, 1986)
(V. G. Thomas, N. Am. J. Fish. Mgmt. 5:488, 1985)

11. Science favorable to suction dredge mining does exist (see above). However, ALL the available science on the effects of suction dredge operation are based upon unregulated operations involving the impact of large scale operation and/or ignoring all established rules and best management practices. In addition, it is not comprehensive in that it does not take into account the concurrent impacts of such things as fishing, droughts and natural diasters / disturbances. On the other hand, science on the effects of regulated fishing is 100% consistant that the impact are significant!

12. Impacts of all users: prospectors, fishermen, rafters etc. need to be inventoried, compared and rated. Then restrictions administered accordingly.

The Effects of Extreme Floods and Placer Mining on the Basic Productivity of Sub Arctic Streams

Alaska Univ., College. Inst. of Water Resources.

Completion rept.
AUTHOR: Morrow, James E.
A2712F3 FLD: 8H, 6F, 64H, 68D, 57H USGRDF7118
1971 12p
REPT NO: IWR-14
PROJECT: OWRR-A-027-ALAS
CONTRCT: OWRR-A-027-ALAS(1)

ABSTRACT: The primary purpose was to establish whether or not mining activity or flooding would affect levels of vegetation and animal life in a sub-arctic stream. The majority of samples taken were in riffle areas, not throughout the whole stream system. Small mining operations do not appear to adversely affect the fauna. Additionally, extreme flooding (Fairbanks, Alaska - August 1967) does not seem to have destroyed bottom dwelling organisms, as the levels in 1968 indicated complete recovery. However, there is every indication that parameters such as pH, DO, temperature, and basic productivity as it relates to these, would be definitely changed when exposed to a large scale operation or high organic overburden. (WRSIC Abstract)

DESCRIPTORS: (*Streams, Industrial wastes), (*Water quality, *Alaska), Mining, Floods, Vegetation, Dissolved gases, Animals, Plants(Botany), Primary biological productivity, Water pollution, Arctic regions

PB-201 654 NTIS Prices: PC$3.00 MF$0.95

FINAL ENVIRONMENTAL

IMPACT REPORT

ADOPTION OF REGULATIONS FOR SUCTION DREDGE MINING

APRIL 1994

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME

I. SUMMARY

SUMMARY OF PROPOSED ACTIONS

The proposed project is the adoption of regulations by the Department of Fish and Game (Department) which would provide for the issuance of annual permits allowing individuals to suction dredge mine in specific streams, rivers and lakes during specified time periods. The regulations would specify terms and conditions for suction dredge operations and would designate which waters of the State would be opened to suction dredge mining. In adopting regulations for suction dredge mining, the Department would be acting in accordance with and pursuant to sections 5653 through 5653.9 of the Fish and Game Code which provide the authority for the regulation of suction dredge mining (Appendix A). The proposed project is specific to suction dredge mining of minerals and does not apply to dredging associated with maintaining navigable waters or sand and gravel mining.

The proposed project would be consistent with the wildlife conservation policy adopted by the Legislature and described in Section 1801 of the Fish and Game Code (Appendix A). The State's wildlife conservation policy includes the objectives of maintaining sufficient populations of all species of wildlife necessary to provide for the beneficial use and enjoyment of all species of wildlife by all citizens of the State and perpetuating all species of wildlife for their intrinsic and ecological values, as well as for their direct benefits to people.

The proposed project would also be consistent with the State's aquatic resources policy as set forth in Section 1700 of the Fish and Game Code which encourages, among other things, the maintenance of sufficient populations of all species of aquatic organisms to ensure their continued existence (Appendix A).

Protection and management of fishery resources (fish are defined in Section 45 of the Fish and Game Code as fish, mollusks, or crustaceans, invertebrates, or amphibians, including any part, spawn, or ova thereof), protection and management of aquatic and riparian communities which support fish habitat, and protection of threatened or endangered plant and animal species, and species of special concern would be the basis for the Department's recommendations regarding the regulation of suction dredge mining.

The proposed project would minimize the impacts to fish and other resources from suction dredge mining. Its objective would be to maintain fish populations and other resources dependent upon the aquatic environment while providing public suction dredge mining opportunities in the State of California. Absent regulations, the impacts of suction dredging to the environment would be significant and deleterious.

V. ENVIRONMENTAL EFFECTS OF THE PROPOSED PROJECT

The proposed regulations would permit regulated suction dredging in California's waters. Unregulated suction dredging can potentially result in deleterious and sometimes significant adverse environmental effects to: (a) benthic (bottom dwelling) and/or invertebrate communities, (b) fish and fish eggs and fry, (c) other aquatic or riparian dependent plant and animal species, (d) channel morphology which includes the bed, bank, channel and flow of streams and rivers, (e) water quality and quantity, and (f) riparian habitat adjacent to streams and rivers (North, 1993, Badali, 1988, Griffith and Andrews, 1981, Harvey, 1986, Harvey and McCleneghan, 1982, Hassler and Somer, 1982, Hassler, Somer and Stern, 1986, Lewis, 1962, McCleneghan and Johnson, 1983, Thomas, 1985).

But based on the best available data specific safeguards included in the proposed project would assure that the impacts to these resources would not be deleterious to fish and would be minimized to less than significant. The safeguards to protect the affected resources include; 1) the designation of waters or areas of the State closed to suction dredging; 2) seasons of operation where suction dredges may be used; and 3) a variety of conditions and restrictions on methods of operation described in Chapter I and III of this document, and in Appendix G, Proposed Regulations.

The proposed regulations take into consideration the degrading condition of the State's rivers and riparian areas and declining status of species including threatened and endangered species as documented in many current documents including California's Rivers, A Public Trust Report, State Lands Commission, 1993, Upper Sacramento River Fisheries and Riparian Habitat Management Plan, 1989, Sliding Toward Extinction: The State of California's Natural Heritage, 1987, Annual Report on the Status of California State Listed Threatened and Endangered Animals and Plants, 1991, Fish Species of Special Concern of California, Department, 1989, Draft Central Valley Anadromous Fisheries and Riparian Wetlands Habitat Protection and Restoration Action, Department, 1993, The Central Valley Fish and Wildlife Management Study, BOR, 1986, and Biodiversity Loss in the Temperate Zone: Decline of Native Fish Fauna in California, Moyle and Williams, 1989. Given the depressed state of river resources in California, as the trustee for fish and wildlife resources for the State of California, the Department has a duty to reduce the adverse impacts on fish and wildlife resources whenever possible. These resources include fish habitat and riparian resources. Thus the Department must take a conservative approach to permitting activities that may adversely affect those resources.

OVERVIEW OF THE EFFECTS OF SUCTION DREDGING ON THE ENVIRONMENT

Effects of unregulated suction dredging on the aquatic environment and fish are documented in scientific literature. Most of the studies have focused on cold water stream environments that support salmon, steelhead or trout.

CONCLUSION

The Department is the trustee for fish and wildlife resources of the State of California. The Department is charged with protecting and managing fish populations and other related aquatic dependent resources in a sound biological manner.

Suction dredge mining can potentially result in the loss of fish production, temporary loss of benthic/invertebrate communities, localized disturbance to streambeds, increased turbidity of water in streams and rivers, and mortality to aquatic plant and animal communities. However, based on best available data, it is anticipated the project to adopt regulations for suction dredging as proposed, will reduce these effects to the environment to less than significant levels and no deleterious effects to fish.

The proposed regulations would result in the maintenance of healthy lake, stream and river systems while allowing for suction dredge mining in California. To further ensure the maintenance of healthy lake, stream and river systems in California, the Department would periodically review and amend regulations based on additional evidence and data.

It should be noted that suction dredging is considered a legitimate activity on California's rivers and suction dredge operators have as much right as any other river user to enjoy and utilize rivers as long as their activities are within the laws and regulations of the State of California.

The Department recognizes there is a long history of other impacts to California's rivers and streams associated with other recreational and commercial activities. These activities include the construction of dams, commercial mining, rafting, fishing, road building and logging. In comparison, the cumulative detrimental effects of these activities are more significant to the overall health of fish and fish habitat than the impacts caused by suction dredging. All negative impacts to the State's rivers are of concern to the Department due to the continuing decline of fisheries and riparian habitat throughout the State. An overview of the historic and current declining condition of the State's rivers and fisheries resources is provided in the 1993 California State Lands Commission's report "California's Rivers - A Public Trust Report".

Effects of Angler Wading on Survival of Trout Eggs and Pre-emergent Fry

BRUCE C. ROBERTS[1] AND ROBERT G. WHITE

U.S. Fish and Wildlife Service, Montana Cooperative Fishery Research Unit[2]
Montana State University, Bozeman, Montana 59717, USA

Abstract.—The effects of angler wading on trout eggs and pre-emergent fry in artificial redds depended on wading frequency and stage of egg or fry development and was similar for brown trout *Salmo trutta*, rainbow trout *Oncorhynchus mykiss*, and cutthroat trout *O. clarki*. Twice-daily wading throughout development killed up to 96% of eggs and pre-emergent fry. A single wading just before hatching killed up to 43%. Wading killed fewest eggs between fertilization and the start of chorion softening (except for a short period during blastopore closure when mortality increased slightly). It killed the most eggs or fry from the time of chorion softening to the start of emergence from the gravel. Restriction of wading could be an effective management tool if trout spawning habitat is limiting and angler use is high during egg development.

A variety of environmental factors can limit trout populations. Spawning habitat is known to limit anadromous salmonid populations but rarely limits resident trout (McFadden 1969). As the popularity of trout fishing has increased, however, questions have arisen about the effect of angler wading on trout recruitment. This question was brought to the forefront in Montana when the State Supreme Court granted public access to all flowing waters. The 1983 ruling allows anglers to wade and fish in all streams between the "ordinary high-water marks" if access is gained legally.

In May 1985, the State Legislature directed the Montana Department of Fish, Wildlife and Parks to adopt rules for the management of recreational use of rivers and streams. A process was established by which persons may petition the Fish and Game Commission to restrict public access to streams if probable detrimental effects of recreational use can be demonstrated.

The first petition filed requested that Nelson Spring Creek be closed to recreational use without permission of the landowners because unlimited wading through important spawning areas would adversely affect recruitment to the trout fishery in both Nelson Spring Creek and the nearby Yellowstone River. We designed this study to test the effects of angler wading on the survival of trout eggs and pre-emergent fry. The null hypothesis to be tested was that angler wading would not reduce survival in redds of brown trout *Salmo trutta*, rainbow trout *Oncorhynchus mykiss*, and cutthroat trout *O. clarki* containing eggs or pre-emergent fry.

Methods

Multiple-Wading Experiments

To evaluate the effects of wading on the survival of eggs and pre-emergent fry of brown trout, rainbow trout, and cutthroat trout, we conducted three laboratory experiments at the U.S. Fish and Wildlife Service Fish Technology Center, Bozeman, Montana. To reduce variability inherent in natural stream channels, we experimented in three constructed channels, each 1.2 m wide × 2.4 m long. Each channel was subdivided into eight chambers, 1.2 m long × 0.3 m wide × 0.33 m deep and filled with rounded stream gravel (Figure 1). Washed stream gravel from local gravel quarries was mixed in a portable cement mixer to match the mean particle-size distribution of five McNeil substrate samples (McNeil and Ahnell 1964) from known spawning areas in Nelson Spring Creek (Table 1). Water flow through each chamber was adjusted to 0.14 ± 0.005 L/s. Gradient in each chamber was near 2%. Dissolved oxygen concentrations (mg/L) in the inflow and outflow were measured periodically. A Taylor recording thermograph monitored water temperature continuously. We calculated Celsius temperature units (CTUs)—the sum of mean daily temperatures above 0°C—to monitor development rates and predict stages of development.

To prepare for planting eggs, we placed a 10-cm layer of gravel in the bottom of each chamber

[1] Present address: U.S. Forest Service, Intermountain Research Station, 316 East Myrtle Street, Boise, Idaho 83702, USA.

[2] Cooperators are the U.S. Fish and Wildlife Service, the Montana Department of Fish, Wildlife and Parks, and Montana State University.

American Fisheries Society Symposium 8:109–122, 1990

Reproductive Indices as Measures of the Effects of Environmental Stressors in Fish

EDWARD M. DONALDSON

West Vancouver Laboratory, Biological Sciences Branch
Department of Fisheries and Oceans, 4160 Marine Drive
West Vancouver, British Columbia V7V 1N6, Canada

Abstract.—Acute reproductive failure in response to severe stress can result in the rapid elimination of fish populations, and reproductive impairment results in the gradual elimination of fish populations. Biological indicators of the impact of environmental stressors on reproduction can be categorized as short-term or long-term measures. Short-term indicators, which can be used either in the field or in the laboratory and vary in degree of sophistication, include sperm motility; alteration in percentage hatch or time of hatch; presence of atretic ova; altered androgen, estrogen, or progestogen concentrations at a single point in the reproductive cycle; failure to spermiate or ovulate; and impairment of spawning. Long-term indicators also can be field or laboratory based; examples are measurement of hormonal changes and timing of reproductive events in a migratory species before and after an anticipated environmental impact, and implementation of partial or complete life cycle tests in a controlled laboratory environment. The use of reproductive variables as critical indicators of the presence of environmental stressors is discussed in the context of new endocrine and nonendocrine methodologies.

The potential value of reproductive variables for evaluation of the effects of stressors on fish has been recognized for several years (Billard et al. 1981; Donaldson and Scherer 1983). Birge et al. (1985) stated that "reproduction in aquatic animals usually is the most critical function affected by chronic toxicant stress." However, despite the development of improved endocrine methodologies and analytical techniques over the last two decades, few investigators have used reproductive indices to evaluate the effects of physical and chemical stressors on fish.

It is axiomatic that reproduction is essential to the continued existence of all species of living organisms. It thus follows that any stressor that interferes with the process of reproduction at the individual or population level is likely to affect the survival of that species in that habitat. Furthermore, any factor that interferes with survival to reproductive maturity, although not necessarily having a direct effect on the reproductive process, will inevitably and adversely affect reproduction. Conversely, the survival of individuals in a particular environment does not necessarily imply that they will reproduce.

Successful reproduction by teleosts requires that several environmental variables fall within critical ranges for each species at each stage of the reproductive process from spermatogenesis or oogenesis through final maturation, spermiation or ovulation, fertilization, embryonic development, and sex differentiation. These environmental factors include temperature, photoperiod, salinity, rainfall, turbidity, oxygen concentration, ammonia concentration, water flow, and the availability of an appropriate animate or inanimate spawning substrate.

The effects of environmental stressors on reproduction ultimately reveal themselves at the population level. A severe acute stressor can cause immediate reproductive failure and rapid elimination of fish populations. A moderate chronic stressor, on the other hand, may cause reproductive impairment, which leads to the gradual reduction or elimination of fish populations (Figure 1). For example, under conditions of moderate stress, fecundity may be reduced (Suter et al. 1987) or the proportion of individuals metabolically capable of reproduction may be reduced.

Reproductive Impairment

In the broad sense, any stressor-induced change in a biochemical, physiological, morphological, developmental, or behavioral variable that ultimately influences the ability of the fish to reproduce could be regarded as an indicator of reproductive impairment. In the narrow sense, any stressor-induced change in the reproductive process itself that influences the ability of the fish to reproduce would clearly be a candidate for

Influence of Capture Methods on Blood Characteristics and Mortality in the Rainbow Trout (*Salmo gairdneri*)[1]

GERALD R. BOUCK AND ROBERT C. BALL

Department of Fisheries and Wildlife, Michigan State University, East Lansing, Michigan

ABSTRACT

Blood characteristics and mortality were compared between rainbow trout which were captured by (1) angling with artificial lures, (2) electroshocking, and (3) seining. The hemoglobin concentration, erythrocyte sizes, plasma protein concentrations, and plasma protein fractions varied according to the method of capture. Mortality was negligible in the shocked and seined lots, but was above 85% in the hooked fish group. Mortality was delayed and the symptoms suggest progressive shock. Definite differences in behavior were noticed in the postcapture fish and included prolonged fasting (shocked and hooked fish), hyperexcitability (shocked fish), and lethargy (hooked fish). The authors believe that presently used methods of capturing and handling fish should be re-evaluated, particularly if the fish are to be used in toxicological or management studies.

INTRODUCTION

The meaningful measurement of sublethal vels of pollution is most difficult and perhaps fers the most challenging area of research in e field of aquatic ecology. As an approach measuring these stress levels, which are stulated to be related to pollution in the enronment, electrophoretic analyses are proming because certain changes in the composion of plasma (or serum) proteins are indicave of stressful conditions (Bier, 1959). In tan, the general increase of low-mobility proins is so common to stressful conditions that Dunn and Pearce (1961) have called this a "stress" pattern. Similar changes have been emonstrated in fish by Fujiya (1961) and e have demonstrated that this also occurs in t least three other species of fish (Bouck and Ball, 1965). To use these changes, it is vitally mportant to recognize normal plasma protein composition. But it is equally important to distinguish between pollution-induced changes and artifacts induced by the methods of capturing the specimens. In this report, we are presenting the results of a study on the effects of capture methods on postcapture mortality and the composition of the blood from rainbow trout (*Salmo gairdneri*).

We have used electrophoresis in studies concerning low oxygen pressures and the effects of heavy metal ions on fish, and the results indicate that it could be a valuable tool in field studies of pollution. Fujiya (1961) utilized serum from fish kept in live-boxes to detect stressful areas in a freshwater bay. However, blood from freshly collected resident fish seems more desirable for these purposes, provided that the capture process does not change the plasma protein composition.

Various methods have been used by others to capture fish intended for blood studies and these methods include gill-netting, angling and electroshocking. While these methods are not known to cause a physiological stress reaction, we are aware of no studies which show that such is not the case. Perhaps the method of capture accounts for the high degree of variability in physiological parameters noted by other investigators (reviewed by Bouck, 1964). Therefore, the influence of capture must be recognized and quantified before our attempts to relate the composition of plasma proteins from resident fish to adverse environmental conditions. Likewise, the influence of capture methods on postcapture mortality is important because it indicates the degree of stress involved.

For our work, we chose to compare the effects of capture by electroshocking and angling to capture by seining. These methods present several problems and, in particular, we were concerned with the time lapse between capture and the time when blood could be collected. In seining and shocking, one usually captures large numbers of fish which can be sampled immediately. Specimens are cap-

[1] Published with the approval of the Director of the Michigan Agricultural Experiment Station as Journal Article No. 3683.

tured at a slower rate by angling, b
orous efforts to escape the hook
pected to influence the specimen.
to standardize our procedures for
perimental lots, we allowed 1 hou
after their capture before drawing
from the first specimen. Thus this
not describe the changes in blood c
which persist for less than 1 hour
ture).

METHODS AND MATERIALS

Approximately 120 rainbow trou
tained from the Wolf Lake Hatch
Michigan Conservation Departmen
1962. The fish were of uniform siz
mean weight of 90 grams and a r
length of 20 centimeters. Specin
signed randomly to three section
ular concrete pond which had a
20 feet and a maximum depth of 3
tap water filled the pond and its te
ranged from 6 to 10 C during the e
This water was at or near satura
for oxygen at each testing. Total
remained near 300 ppm and the pH
very close to 8.3. Fish food pellets
to the fish each day.

After 6 days in the pond, speci
collected by angling with artificial
which exhibited bleeding were elimin
the experiment. Each fish was "pla
indicated exhaustion. The hook wa
while the specimen was out of the w
which the fish was placed into o
live-boxes. In sum, we attempted t
the capture of a rainbow trout by a
by tossing a coin, the fish in one
signed to the blood study and
were assigned to the mortality study
Two days later, control specim
ned and assigned in the same man
days later, specimens were collecte
230-volt d-c generator with hand-
nodes. The stunned fish were netted
possible, removed from the fiel
and assigned as before.

Specimens for the mortality st
transferred to three tanks containin
of aged tap water drawn from
source. This water was continuous
compressed air. Each lot (seine

Mortality of Anadromous Coastal Cutthroat Trout Caught with Artificial Lures and Natural Bait

GILBERT B. PAULEY[1] AND G. L. THOMAS[2]

Washington Cooperative Fish and Wildlife Research Unit[3]
College of Ocean and Fishery Sciences, University of Washington
Seattle, Washington 98195, USA

Abstract.—The mortality of anadromous coastal cutthroat trout *Oncorhynchus clarki* taken by anglers with worm-baited hooks of four different sizes, spinners with single hooks, spinners with treble hooks, and spinners with treble hooks baited with worms was investigated on the Stillaguamish and Snohomish rivers in Washington. In all but two comparisons mortality of cutthroat trout was greater ($P < 0.05$) from the four sizes of worm-baited hooks (39.5–58.1%) than from the three different spinner treatments (10.5–23.8%). The probability of killing fish was greater ($P < 0.05$) when fish were hooked in either the gill (95.5%), tongue (66.7%), esophagus (65.5%), or eye (53.8%) than in other anatomical locations. A group of untagged fish that were caught on worm-baited hooks but hooked only in the jaw or mouth were used as control fish to evaluate tagging mortality. The mortality of the untagged group (7.4%) was not greater than the mortality of fish caught on all terminal gear types and hooked in the upper or lower jaw (5.8%), suggesting that mortality from tagging was not an important factor. Mortality was positively related to bleeding at the time of hooking. Hooking a fish in a critical anatomical part was the most important factor causing subsequent mortality.

Anadromous coastal cutthroat trout *Oncorhynchus clarki* are found in most maritime tributaries of the west coast of North America from Prince William Sound in south-central Alaska to Humboldt Bay in northern California (Pauley et al. 1989; Trotter 1989). Surveys of anglers conducted by the National Marine Fisheries Service in 1974 in the Puget Sound area suggested that anadromous coastal cutthroat trout were second only to salmon in popularity among saltwater anglers (Johnston and Mercer 1976). To ensure that the populations of native sea-run cutthroat trout are not overexploited, the Washington Department of Wildlife (WDW) initiated a management policy that allows all female fish to spawn at least once (Mongillo 1984). To accomplish this, WDW refined harvest regulations for anadromous cutthroat trout by location of the fishery, creel limits, and size restrictions for harvest of fish. Gear restrictions to reduce mortality of released fish also would be beneficial. The success of this type of regulation depends on identification of the factors that cause mortality of released fish.

Hooking mortality in resident cutthroat trout (Hunsaker et al. 1970; Marnell and Hunsaker 1970; Gresswell 1976; Dotson 1982; Schill and Griffith 1986; Titus and Vanicek 1988) and anadromous steelhead (anadromous rainbow trout *Oncorhynchus mykiss*) (Reingold 1975; Pettit 1977) has been examined; however, this report is the first on hooking mortality in native populations of anadromous coastal cutthroat trout. The objective of the study was to estimate and evaluate the causes of hooking mortality of anadromous coastal cutthroat trout by standard angling methods with worm-baited hooks and spinning lures.

Study Area

Cutthroat trout were caught from two river systems that drain into central Puget Sound, Washington: the Snohomish River system (35 mi north of Seattle), including its two main tributaries, the Skykomish and Snoqualmie rivers, and the Stillaguamish River (55 mi north of Seattle). Most fish taken from the Snohomish River were caught in the tidal reaches of the river downstream from the town of Snohomish. However, a few fish were caught above tidal influence. All fish caught in the Skykomish and Snoqualmie rivers were above any tidal influence. All fish caught in the Stillaguamish River were taken upstream from tidal influence in a 4-mi section of the river just below the confluence of the north and south forks of the river. Both river systems have populations of anadromous

[1] Employed by the U.S. Fish and Wildlife Service.
[2] Present address: Prince William Sound Science Center, Post Office Box 705, Cordova, Alaska 99574, USA.
[3] The Unit is sponsored jointly by the U.S. Fish and Wildlife Service; the Washington State Departments of Ecology, of Fisheries, of Natural Resources, and of Wildlife; and the University of Washington.

Immunological Indicators: Effects of Environmental Stress on Immune Protection and Disease Outbreaks

DOUGLAS P. ANDERSON

U.S. Fish and Wildlife Service
National Fish Health Research Laboratory
Box 700, Kearneysville, West Virginia 25430, USA

Abstract.—The immune response in fish can be compromised by environmental stressors. Researchers have shown that exposure to phenol in the water can reduce the numbers of antibody-producing cells; some drug treatments may diminish macrophage activities; and pesticide derivatives can inhibit lymphocyte proliferation. Immunological tests such as particle agglutination, fluorescent antibody techniques, and enzyme immunosorbent assays are used routinely to monitor for disease-causing agents in fish at hatcheries, farms, and aquaculture facilities and can also be used to indicate environmental stress. Fishery biologists use the information from these tests to decide whether measures should be taken to immunize fish or treat them with drugs or, if possible, to alter the environment to prevent disease outbreaks. In many cases, pathogens are already present in the environment or carried by the fish, and a compromised immune system makes the fish more susceptible to these agents. Because fish protect themselves against diseases and harmful antigens by a complex immune system similar to that of humans and other animals, the physiological pathways are known. The cellular components include macrophages for pathogen surveillance and antigen uptake, monocytes for transportation of antigens to the kidney and splenic immunopoietic sites, and multiple subpopulations of lymphocytes for target destruction and antibody production. These cells and organs are linked through biochemical signals that are susceptible to immunomodulation by well-recognized drugs and chemicals. If tests indicate that the immune system is compromised, disease outbreaks may be predicted and steps can be taken to save the fish.

Fish in all environments, including hatcheries, ıh farms, aquaculture facilities, and natural wa-rs, sometimes die because of stressful condi-ɔns. Fishery biologists have recognized that pid temperature changes, handling, and deteri-ation of water quality adversely affect fish alth (Wedemeyer 1970; Snieszko 1974; Zeeman d Brindley 1981; Anderson et al. 1984; Zeeman 86). Although fish often appear to be healthy fore, during, and immediately after a period of ess, a disease outbreak or chronic mortality ıy develop in the population later, and a specific thogen may be isolated or implicated. Many fish : asymptomatic carriers of pathogens that under :mal conditions are held in check by the im-ne system. When that system is impaired or ɔpressed by stress, the disease-causing agent y multiply, gain control, and kill its host.

'ish protect themselves against pathogenic mi-organisms by an immune system comparable hat of humans and other vertebrates. The rapid ıansion of the science of immunology has re-led the complexity of this finely tuned system. ch consists of a multitude of nonspecific de-ɜe barriers and specific immune functions. The line of nonspecific protective defenses in-cludes physical guards and barriers such as scales and skin, the components of mucus, lysozymes and other bacteriolytic enzymes, and the viscous mucopolysaccharides that impede the movement of microorganisms. If these barriers are pene-trated by a pathogen, the resulting inflammation attracts phagocytic cells, neutrophils, and other leukocytes that destroy the invader. In contrast, the specific immune response is an induced reac-tion to particular, individual invaders or antigens, and involves specialized factors that are produced by communication among cell receptors, signal molecules, and mediators. The first component of the specific immune response, the afferent sys-tem, receives and processes invasive materials and provides information to the second compo-nent, the efferent system. Here this information is passed on to elicit the production of specific antibodies and activation of cells for protection of the fish against pathogens.

Stress on an animal may compromise the func-tioning of the defense mechanisms. In the physi-ological pathways of the nonspecific and specific immune responses, steps that might be directly affected are those involved in initial inflammation, antigen recognition, or transportation of the anti-

Growth, Survival, and Vulnerability to Angling of Three Wild Brook Trout Strains Exposed to Different Levels of Angler Exploitation

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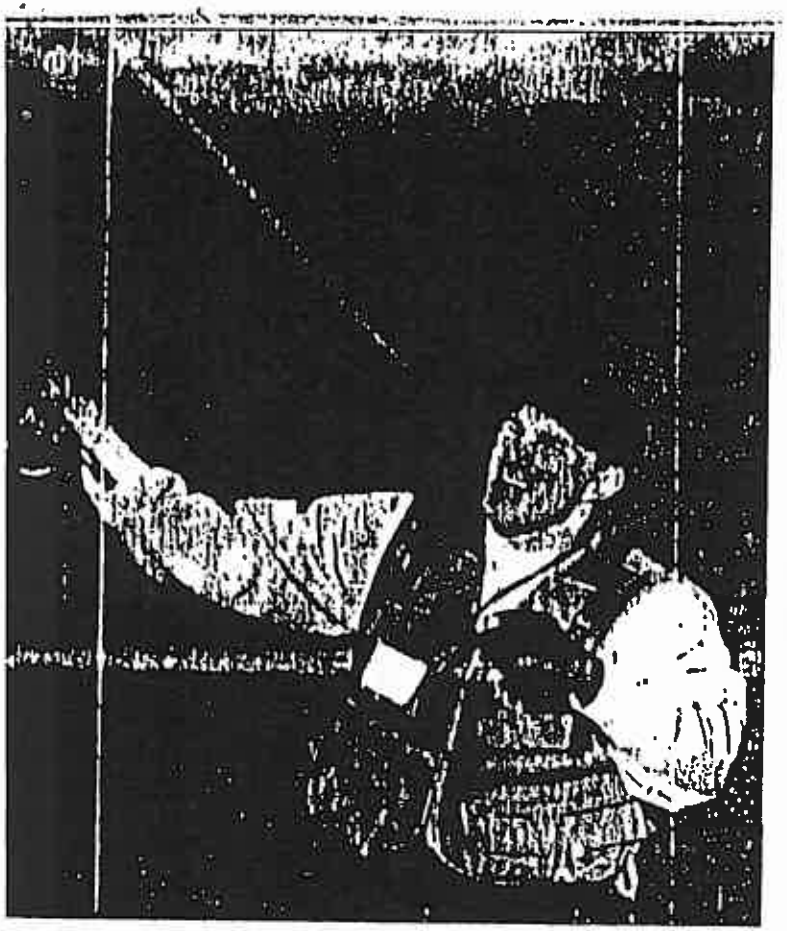
Abstract.—It has been suggested that the genetic growth potential of trout may be degraded over time by differential angler harvest of the faster-growing fish of each cohort. To test this hypothesis, young-of-the-year wild brook trout *Salvelinus fontinalis* from two branches of the Au Sable River and from the East Branch of the Fox River were stocked in three experimental Michigan lakes to determine their relative 2-year growth and survival. Brook trout populations from the Au Sable River are believed to have been exploited more intensively than the population from the East Branch of the Fox River. We found that brook trout from the East Branch Fox River grew significantly faster than fish from either the North Branch or the mainstream Au Sable River. The superior growth of East Branch Fox River brook trout was most evident in Hemlock Lake, where all strains grew best. Mature males were significantly longer and heavier than mature females when data were pooled across strains for each lake. East Branch Fox River mature females allocated relatively less energy to gonadal tissue than mature females of the Au Sable River strains. There were no significant differences in survival between the three brook trout stocks tested. A significantly higher percentage of the population of faster-growing East Branch Fox strain brook trout were caught from North Twin Lake by experimental angling than of either of the Au Sable River strains. The results of this study suggest that the intensity of angler exploitation, over time, may have altered the genetic potential for growth and catchability of these wild brook trout strains. It is also possible that founder stocks were genetically dissimilar or that genetic divergence resulted from differences in natural selection pressures between the study rivers. Although it could not be determined from this study why the growth and catch rates varied among the wild stocks tested, the documented differences provide information on stock performance that can be used by fisheries managers.

Biologists and anglers have hypothesized that me growth differences observed among popu- tions of brook trout *Salvelinus fontinalis* may be ie to genetic differences in their growth potential well as to the productivity of their environment. has been further suggested that the genetic growth ıtential of trout has been degraded over time by fferential angler harvest of the faster-growing fish each cohort, which leaves the slower growers reproduce the stock. The impetus for this study ıs provided by the finding of Alexander (1987) at wild populations of brown trout *Salmo trutta* at were believed to have been exposed to high vels of size-selective exploitation grew more owly than more lightly exploited stocks. Cooper 952) showed that anglers differentially exploited faster-growing brook trout in Michigan's Pi- on River. Further evidence that growth and an- r catchability are positively related was reported Brauhn and Kincaid (1982) and Dwyer and per (1984), who found that strains of rainbow out *Oncorhynchus mykiss* genetically selected for ter growth were more vulnerable to angling than wer-growing domestic or wild rainbow trout strains. The probability of angler capture also appears to increase with fish size for brown trout, largemouth bass *Micropterus salmoides*, and smallmouth bass *Micropterus dolomieu* (Favro et al. 1986; Burkett et al. 1986; Clapp and Clark 1989). Circumstantial evidence suggests that selective harvest of the faster-growing fish of a cohort in commercial or sport fisheries may reduce the genetic growth potential of fish stocks (Handford et al. 1977; Ricker 1981; Alexander 1987). Other possible evolutionary responses to size-selective exploitation include reductions in fish age and size at first reproduction (Kennedy 1953; Healey 1975; Handford et al. 1977). Modification of phenotypic variation by exploitation imposes the risk of a reduction of genotypic diversity, which in turn could result in a lower level of fitness (Kapuscinski and Lannan 1986).

The greater vulnerability to angling of brook trout compared with brown trout could theoretically result in more intense selection for slower growth. The primary purpose of the present study was to determine if wild brook trout from the East Branch Fox River, Michigan, that have been ex-



Chris Butler/The Idaho Statesman

Becknor of Boise squints into the sun as he casts a line in the River while participating in the Boise River Whitefish Derby.

Ruhl rules Whitefish Derby

115 anglers turn out for benefit event

By Stephen Dodge
The Idaho Statesman

Whitefish quiche? Broiled whitefish burgers? Whitefish provencale?

Ryan Winters discovered a few things about whitefish Saturday afternoon: They can be filleted, smoked, stuffed or pickled. You can fry them, bake them and broil them.

But catch them? Well, after an afternoon of frustration, Winters was left fishing for answers on that one.

"I can't figure out where these stupid fish are," he said midway through the Boise River Whitefish Derby. "And you can't go to the deeper pools, because there are some real pigs up there."

Winters, who caught two fish, was referring to the anglers upriver, and not their prey. Some of the early fishers crowded into the deep pools to steal the best spots — and fished nearly elbow-to-elbow in some places.

The 115 entrants were fishing for prizes, fun and to improve the reputation of the Rodney Dangerfield of aquatic wildlife, the whitefish. The small fish, often considered a trash fish, were said by many of the anglers to be quite tasty — although a couple admitted the trick is "to not taste them at all."

They even handed out recipes, including Whitefish Nuggets, and another recipe calling for (Quick! Call Peter Schott's!) broiled whitefish with sherry butter.

Some of the winners were real pigs, and this is no longer a reference to the guy holding the rod and reel. When Bryan Ruhl landed the winning fish (17⅞ inches), he stood on the bank screaming "It's a hog! It's a hog!"

Ruhl's landing of the monster was not exactly textbook.

"I was pretty excited," the Meridian resident said. "I started dragging it up toward the bank and then ran for it.

"I ended up stepping on my line and breaking it, and I had to grab it out of the water with my hands."

Then, according to friend Bill Donaldson, "he carried it around in front of him screaming."

Ruhl, who won a fly reel, thought he had a shot at the "most fish" title, too — but Kent Roberts beat him to it.

Roberts caught his 50th fish (the limit) in just under three hours, winning a fly rod. Most of his fish ran between 10 and 12 inches.

"I feel a little bit better," Roberts said. "Last year I fell down in the middle of the river. It was kinda fun to get out and fish a little — and not get wet."

Each angler paid a $3 entry fee, with the money benefiting the Woolly Buggers — the Boise Valley Fly Fishermen's youth group.

Derby finishers

Top three finishers in the Boise River Whitefish Derby, held Saturday.

Biggest fish: 1. Bryan Ruhl, 17⅞; 2. Tom Governale, 16½; 3. Dwayne Speegle, 15¾.

Most fish: 1. Kent Roberts, 50; 2. Ron Stockdale, 50; 3. Fred Hohno, 34.

Idaho Statesman 1/21/95

FISHING IMPACT FACTS

1. Idaho's general fishing season runs from late May through November and all year around in some areas and for some species. Rainbow, brook and cutthroat trout spawn in late April through early June and eggs remain in the gravel another 4 to 7 weeks depending on water temperture. Bull and Brown trout spawn in October through November and eggs stay in the gravel all winter and hatch in the spring. Results: fishing is occuring during the majority of the fish reproduction cycle. (F&G Regulations and Handbook of Freshwater Fishery Biology)

2. Mortality of fish caught (and then released) with artifical lures ranges from 10.5% to 23.8% depending on hook size and fish species. Fish that bleed or are hooked in the gills have a 53% and 95.5% mortality rate respectively. (N. Am. J. Fish. Mgmt. 13:337) See exhibit.

3. The effects of stress on fish are manifest in three primary processes: mortality, growth, and reproduction. Although fish often appear to be healthy before, during, and immediately after a period of stress, a disease outbreak or chronic mortality may develop later. (AM. Fish. Soc. Sym. 8:80, 8:38 1990) See exhibit.

4. Wild trout (like the Bull Trout) have higher mortality rates because they attack and fight harder. (WA. F&G Mgmt. Div. Rep. by P.E. Mongillo 1984)

5. Twice daily wading during the egg fertilization to fry emergence stages killed up to 96% of the eggs and pre-emergent trout fry. Harvest and wading restrictions in combination would substantially improve fish populations.(N. Am. J. Fish. Mgmt. 12:454, 1992) See exhibit.

7. Fish caught in warmer temperatures have a lower survival rate. Mortality rates of trout caught with worm baited hooks are as high as 73%. (Prog. Fish-Culturtist 32:231)

8. Stress can result in acute reproductive failure and in the gradual elimination of fish populations. (AM. Fish. Soc. Sym. 8:109) See exhibit.

9. Trout subjected to lower angler pressure grow faster and reach higher maximum weights and sizes. (N. Am. J. Fish. Mgmt. 14:423)

10. Trout subjected to high angler exploitation over time have altered genetic potential for growth and resultant negative genetic divergence resulting from differences in natural selection breeding processes. (N. Am. J. Fish. Mgmt. 14:423, 1994) See exhibit.

11. Negative effects to trout populations are correlated to human trampling of river riparian areas. (Am. Fish. Soc. Spec. Pub. 19:459, 1991)

12. The most important factors in the decline of the Priest Lake Cutthroat Trout are competition with introduced species, spawning taking, poaching and fishing pressure. (IDF&G Dingell - Johnson Report Proj. F-24-R. pg. 176.)

13. Fly fisherman are considered "heros" for trampling fish nests and harverting scores of fish in a single day. (Idaho Statesman 1/21/95). See exhibit.

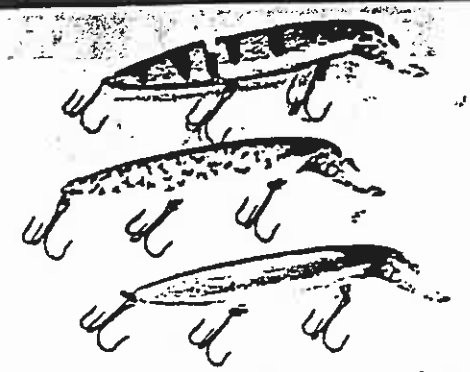
14. Fly fisherman conservation groups have removed streams from mineral entry and general fishing and have been allowed to dictate use to the public. (Ron Mackelprang 345-9360)

15. Mortatoria on fishing in Maryland restored fisheries. Conventional measures to reduce catch through size limits, seasons, gear limitations and daily catch limits failed to reverse fish population detoriation. (Fisheries, Vol. 18, No. 6, 1993)

16. Float boating and power boating may also affect listed species through disturbance of spawning adults or by physical disturbance of redds. Float boaters may step on redds as they push their boats over shallow riffle areas where listed salmon are likely to spawn. Jet boats passing over or in close proximity upstream from redds may increase intragravel pressure from high speed motors or disturb sediment which could settle out on eggs and reduce egg-to-fry survival. (Biological Opinion, PACFISH, NMFS, Mar. 1995)

Deadly Kits for Muskies and Pike!

Field Editor Joe Bucher, a top muskie-pike angler, hand-picked these lures to help you conquer various clear- or dingy-water conditions



FREE $4 VALUE with every crankbait kit – "DepthRaider Fishing Secrets" pamphlet and a 25-pack of super-strength (30-lb.-test) split rings.

KIT ❶ CLEAR-WATER CRANKBAITS:

Straight-bodied DepthRaider *(crappie pattern)* for faster speeds and when working thicker cover. NEW Countdown model *(silver minnow)* that sinks about a foot a second to strain various depths: Jointed *(natural perch)* for shallower levels, over weed tops, night fishing, slower retrieves, less-active fish, open-water trolling and darker skies.

KIT ❷ DINGY-WATER CRANKBAITS:

Brighter, more visible patterns. Use straight-bodied DepthRaider *(chart-gold)* along deeper edges (drop-offs, weed lines, humps, etc.) and around heavier cover. Use jointed *(hot perch)* for slower speeds and at shallow running depths. Use ShallowRaider *(fire tiger)* over cover, along shallower edges, or when fish are up. Also makes an excellent twitch- or jerkbait.

FREE $9 VALUE with every bucktail kit – *Bucktail Fishing for Muskies* book and 25-pack of super-strength (300-lb.-test) split rings.

KIT ❸ CLEAR-WATER BUCKTAILS:

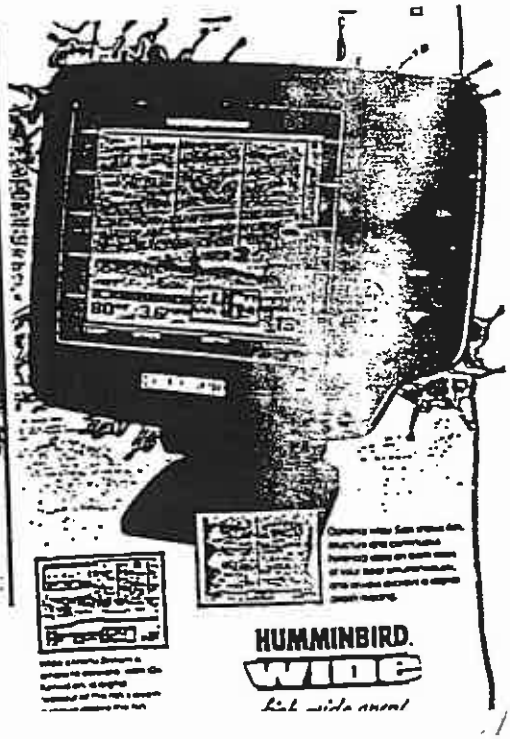
Many anglers consider the size 7 fluted blade (on two of these bucktails) the best and most versatile bucktail blade. It can be run just under the surface so it humps up the water for active shallower fish or at deeper levels. Willow-leaf blade on red/white Willow Buck offers less drag for deeper retrieves.

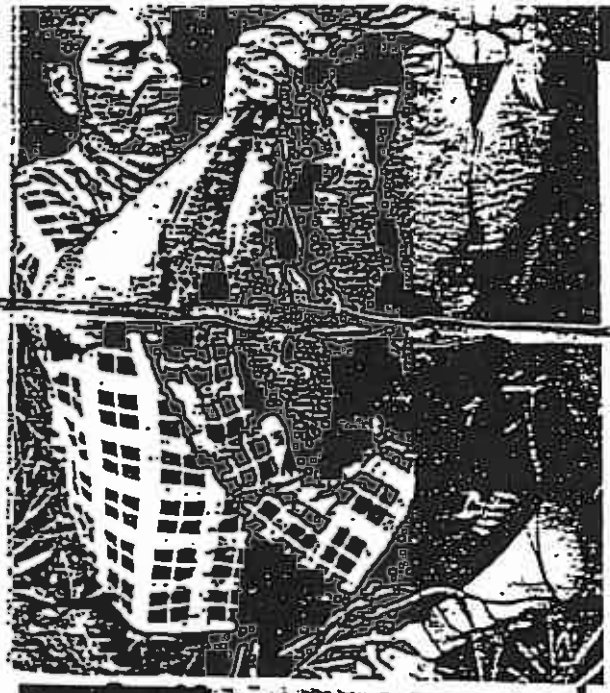
KIT ❹ DINGY-WATER BUCKTAILS:

Almost 20 years of guiding has shown these patterns best for dingy or stained waters. Use rounded blades for more lift, willow leaf for faster, deeper retrieves and for a different blade beat. Quality construction to hold big fish.

◀ VIDEO A: "Modern Musky Methods": Join Contributing Editor Jim Saric as he shows modern methods to catch muskies. Topics covered: mid-lake structures, hi-tech trolling, night fishing, using artificial/live bait combinations. Best muskie-teaching video we've seen! ($19.95 + $3.00 s&h)

▶ VIDEO B: "Filleting Northerns": Anglers who know how to make pike fillets boneless enjoy great eating. And you can easily learn to take the Y-bones out of pike, muskies or pickerel with Greg Bohn's supercut method. ($9.95 +$2.00 s&h)





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Some people say interest in sportfishing is declining. Yeah, right! Try to tell that to this group of avid anglers.

WASHINGTON STATE
DEPARTMENT OF
ECOLOGY

March 2005

Publication No. 05-03-007
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This report is available on the Department of Ecology home page on the World Wide Web at

Data for this project are available at Ecology's Environmental Information Management (EIM) website . Search User Study ID, AJOH0045.

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WASHINGTON STATE
DEPARTMENT OF
ECOLOGY

Effects of Small-Scale Gold Dredging on Arsenic, Copper, Lead, and Zinc Concentrations in the Similkameen River

by

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March 2005

Waterbody No. WA-49-1030

Publication No. 05-03-007

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Table 11. Estimated Number of Dredges Required to Increase Metals Concentrations in the Similkameen River by 1%, 10%, and 100% 23

A field study was conducted to determine if small-scale gold dredges operating in the Similkameen River exacerbate current exceedances of the human health criteria for arsenic or result in violations of aquatic life criteria for arsenic, copper, lead, or zinc. Dredge effluents were analyzed from 14 sites on the river, and discharge plumes were sampled below three dredges. Data were also obtained on ambient metals concentrations, total suspended solids, and turbidity.

Results showed that the metals concentrations discharged from small-scale gold dredges are not a significant toxicity concern for aquatic life in the Similkameen River. Although this activity will exacerbate exceedances of arsenic human health criteria, it would take very large numbers of dredges to effect a 10% change in the river's arsenic levels, even at low-flow conditions.

The authors of this report thank the many miners who gave permission to sample the effluent from their gold dredges. We very much appreciate the cooperation and friendly reception Ecology personnel received at the 2004 Gold Dredge Rally in Oroville. Special thanks to Jim Creegan for his efforts to help us obtain samples and to Mark Erickson and Greg Christensen of the Resources Coalition for their support and cooperation in the sampling effort at the rally.

The authors also would like to acknowledge the good work of staff at the Ecology Manchester Environmental Laboratory in analyzing the samples for this project, especially Dean Momohara, Meredith Jones, Aileen Richmond, Sara Sekerak, Jamie Martin, and Sally Cull.

Samples for this study were collected with the assistance of Chris Coffin, Ray Latham, and Terry Wittmeier of the Ecology Central Regional Office.

The Similkameen River is located in north-central Washington (Figure 1). During the public comment period on the *Lower Similkameen River Arsenic Total Maximum Daily Load* submittal report (Peterschmidt and Edmond, 2004), concerns were raised by the community and the Colville Confederated Tribes regarding the potential impact of small-scale gold dredging on arsenic concentrations in the river. An earlier laboratory simulation conducted by the Washington State Department of Ecology (Ecology) had concluded that arsenic and other metals would be rapidly diluted downstream of a dredge (Johnson, 1999). The applicability of these data to field conditions was called into question.

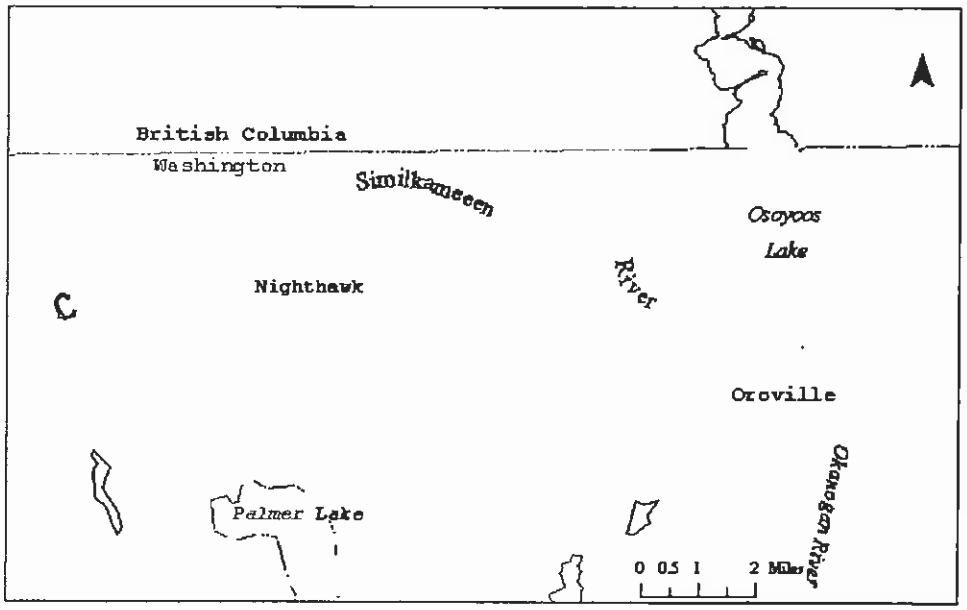

Figure 1. The Similkameen River

Dredging activities have been traditionally allowed on the Similkameen under mineral prospecting leases from the Washington State Department of Natural Resources (DNR). It is difficult to quantify the actual amount of dredging that occurs. The Ecology Central Regional Office (CRO) has observed up to 20 dredges on the river, although only some are in operation at any one time.

The dredging season is limited to July 1 through September 30, to protect salmon spawning. There are no restrictions on where dredging can be done along the length of the river. Dredging operations and high banking are limited to the wetted perimeter of the stream, or, with appropriate water rights, to within 200 feet inland of the ordinary high water mark.

The Washington Department of Fish and Wildlife (WDFW) is the lead agency regulating small-scale mining and prospecting. Their *Gold and Fish* pamphlet constitutes the Hydraulic Project

Approval (HPA) permit that small-scale prospectors and miners must comply with when conducting activities covered in the pamphlet. Exceptions to the pamphlet, authorization for other mining and prospecting activities, or use of other equipment types than authorized in *Gold and Fish* can be granted through issuance of a written HPA. Among other regulations, WDFW requires a minimum 200-foot separation between dredges. The role of Ecology in this activity is to administer water quality standards to prevent interferences with or harm to beneficial uses of state waters.

A typical commercially available dredge is pictured in Figure 2. A 4-inch diameter intake nozzle is the maximum currently allowed under authority of the *Gold and Fish* pamphlet and is most commonly used by small-scale prospectors and miners. Larger dredges can and have been permitted on the Similkameen River in the past.

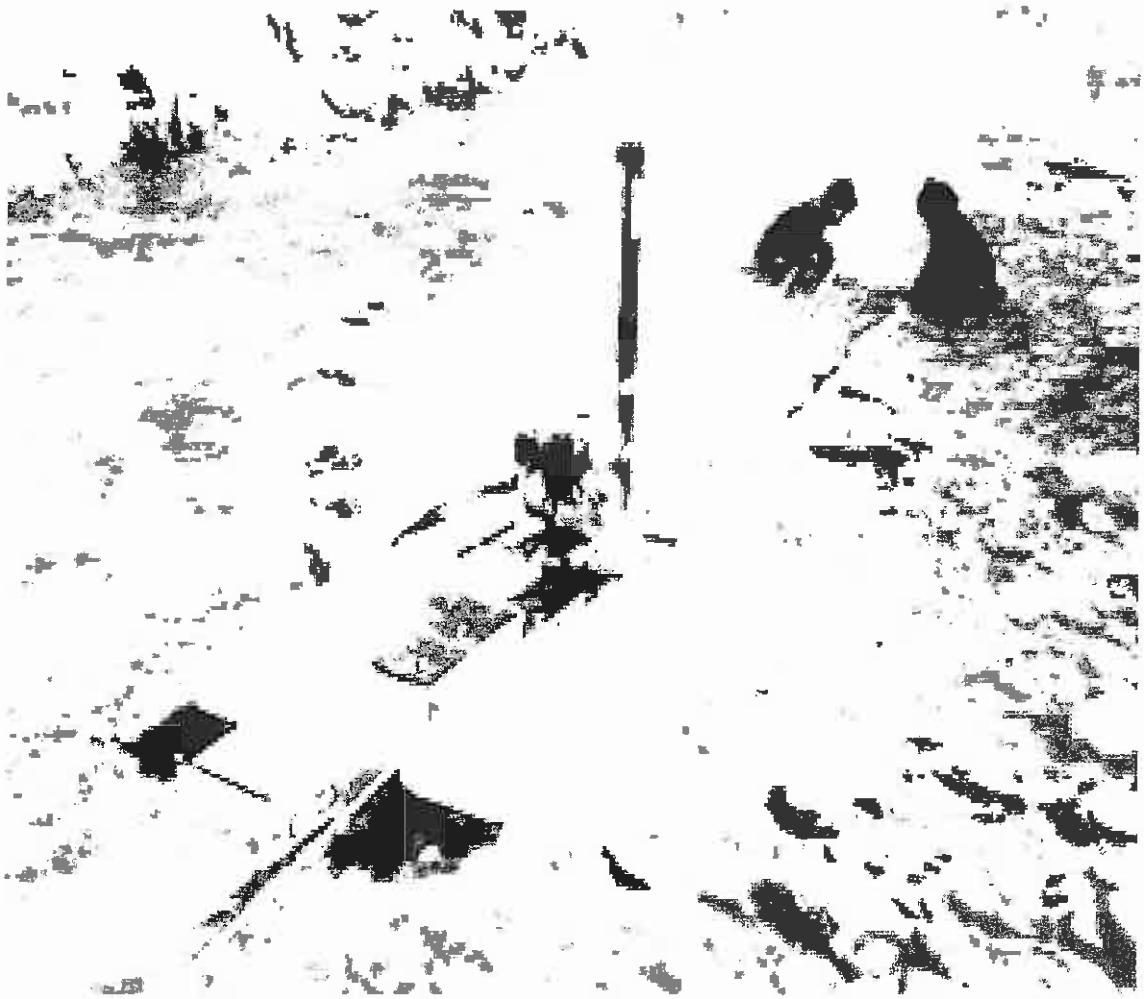

Figure 2. A Small-scale Gold Dredge
( ).

Except for arsenic, the level of chemical contamination in Similkameen River sediments is relatively low, both for metals and organic compounds (Johnson and Plotnikoff, 2000; Colville Confederated Tribes, unpublished data). Appendix A has a summary of Ecology's sediment chemistry data for the Similkameen.

Arsenic concentrations generally range from 10 – 50 mg/Kg[1] (Figure 3). Samples in the vicinity of Nighthawk and Oroville have exceeded a recently proposed Washington state sediment quality guideline of 20 mg/Kg for protection of aquatic life (Avocet Consulting, 2003). Most Washington rivers and streams have less than 10 mg/Kg arsenic in their sediments (Johnson, 2002a).

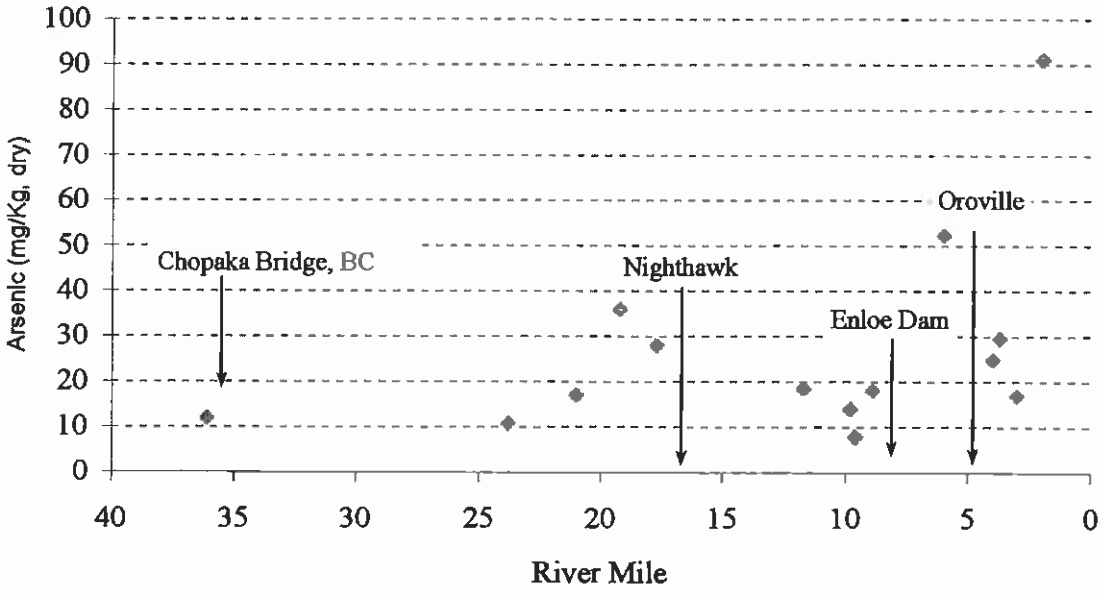

Figure 3. Arsenic Concentrations in Similkameen River Sediments (from Johnson, 2002a)

Arsenic is also elevated in the Similkameen water column, with concentrations of 1.0 - 5.0 ug/L[2] typically being encountered (Johnson, 2002a). Most Washington rivers have arsenic concentrations ranging from 0.2 – 1.0 ug/L (Johnson, 2002b). Other metals are not substantially elevated in the Similkameen River. Appendix B has Similkameen River metals data for 1995 - 2004 from Ecology's routine monitoring station at Oroville.

[1] mg/Kg = parts per million
[2] ug/L = parts per billion

A technical study conducted for the Similkameen River arsenic TMDL concluded that the major source of the higher arsenic concentrations was tailings from historical mining activity in British Columbia (Johnson, 2002a). Resuspension of contaminated sediments was identified as a potentially important source of arsenic to the water column.

Water quality criteria for metals being analyzed in the present study are shown in Table 1. Like most Washington rivers, the natural background concentration of arsenic in the Similkameen exceeds the very low human health criteria of 0.018 and 0.14 ug/L. Washington's human health criteria are from the EPA National Toxics Rule and are based on a one-in-one million excess cancer risk from consuming fish and water, or fish only. There are no equivalent human health criteria for copper, lead, or zinc. The aquatic life criteria shown below for arsenic, copper, lead, and zinc are not exceeded in the Similkameen River.

Table 1. Applicable Washington State Water Quality Criteria for Metals (ug/L)

	Aquatic Life Criteria*		Human Health Criteria	
Metal	Acute	Chronic	Fish + Water Consumption	Fish Consumption
Arsenic	360	190	0.018†	0.14†
Copper**	9.2	6.5	- -	- -
Lead**	31	1.2	–	- -
Zinc**	66	60	- -	- -

WAC 173-201A
*applies to dissolved metals
†applies to total inorganic arsenic
**criteria adjusted for 52 mg/L hardness (lowest recorded during present study)

Arsenic has been shown to increase going downstream from Chopaka, B.C. (river mile 36) to Oroville (Figure 4). This is primarily due to the Palmer Lake outlet at r.m. 19.5, a major arsenic source to the lower river. Palmer Lake has been contaminated by inflows from the Similkameen River and may have additional local sources of arsenic. (Johnson, 2002)

The previously mentioned dredging simulation study conducted by Ecology involved mixing predetermined amounts of Similkameen River water and sediment to approximate a dredged material slurry (the Elutriate Test described in Plumb (1981)). After shaking for 30 minutes, the supernatant from the mixture was allowed to settle, then filtered and analyzed. The samples used in this test were obtained near Eagle Rock (r.m. 11.7) and just above Enloe Dam (r.m. 8.9), areas where dredging was either underway or planned. Arsenic concentrations were 14 - 18 mg/Kg in the bulk sediments and 3.9 ug/L in the river water.

Results of the simulation showed that arsenic, copper, lead, and zinc were the metals of primary interest. Arsenic concentrations in the elutriate were 5 – 10 times higher than the river water used in the test. Copper and lead exceeded aquatic life criteria by factors of 2 – 4. Zinc approached half its aquatic life criteria values. A point source dilution model applied to these

data suggested that at least a five-fold dilution would occur immediately downstream of a dredge during low-flow conditions. It was concluded that water quality concerns were probably negligible for metals, at least with respect to individual dredges.

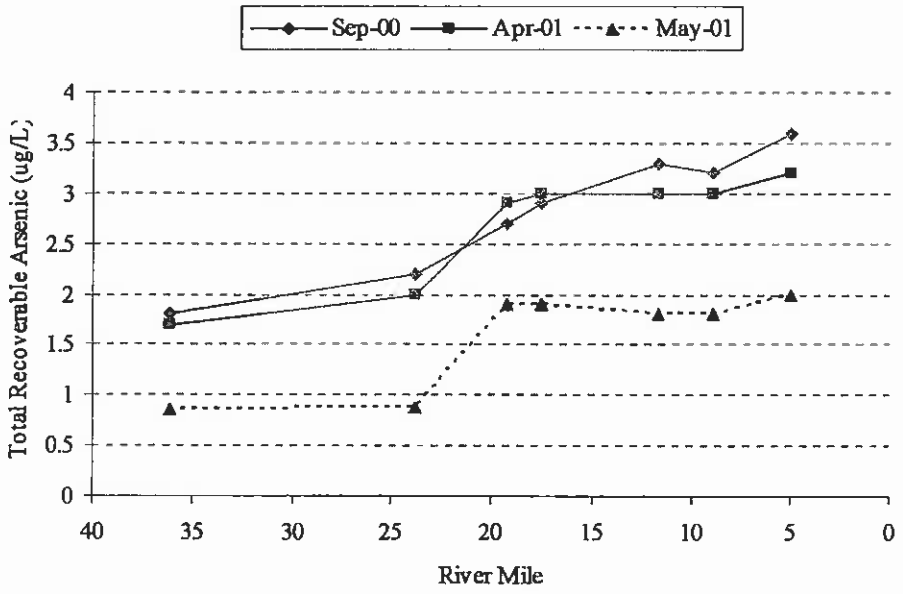

Figure 4. Arsenic Concentrations in Similkameen River Water Samples (from Johnson, 2002a).

In response to the concerns expressed by the community and Tribe, Ecology conducted a field study to obtain water samples in the vicinity of small-scale gold dredges operating in the Similkameen River during the summer of 2004. The objectives of the study were to determine if dredging: 1) exacerbates current exceedances of the human health criteria for arsenic, or 2) results in violations of the aquatic life criteria for arsenic, copper, lead, or zinc. The study was not designed to assess compliance with the state turbidity standard or to determine the effect of dredging on total suspended solids (TSS) concentrations in the river.

Three types of water samples were collected for the study: Ambient samples were collected in the upper river to determine background concentrations for the metals and other parameters of interest. Effluents were sampled from dredges operating at 14 sites along the river to represent a range of substrates and associated metals concentrations. Finally, the turbidity plumes downstream of three dredges were sampled at selected distances to gage the downstream extent of the impacted area.

Clean sampling techniques and low-level analytical methods were used to analyze arsenic, copper, lead, and zinc. TSS, turbidity, and hardness were also measured. Hardness was needed to calculate the water quality criteria for copper, lead, and zinc. Some data were also obtained on effluent flow rates and stream velocities in the vicinity of the dredges. River discharge was determined from the gaging station operated by the U.S. Geological Survey (USGS) at Nighthawk (http://nwis.waterdata.usgs.gov/usa/nwis/discharge).

Field work was conducted once each month during the July 1 – September 30 period when dredging is permitted. The study was conducted by the Ecology Environmental Assessment Program with field assistance provided by CRO. The samples were analyzed by the Ecology Manchester Environmental Laboratory.

Samples for the gold dredge study were collected on June 30 - July 1, August 18 - 19, and September 21 - 22, 2004. Monthly average river flow during this period typically ranges from 3,029 cfs (July) to 616 cfs (September).

The first set of samples corresponded to the July 1 opening of the mineral prospecting work window. The second sample set was collected during a Resources Coalition dredge rally held in Oroville on August 18 - 22, an event designed to generate interest and improve understanding of small-scale gold dredging. The third sample set was intended to assess dredging impacts during September low flow.

Ambient Samples

Background concentrations for the metals and other parameters of interest were determined by analyzing water samples collected in the Similkameen River approximately 3 ½ miles below Nighthawk (Figure 5). This location is in the upper part of the reach where most dredgers work. The ambient samples were collected on June 30, the day before the opening of the dredging season, and again in the early morning of August 19 and September 22 before dredgers began working the river.

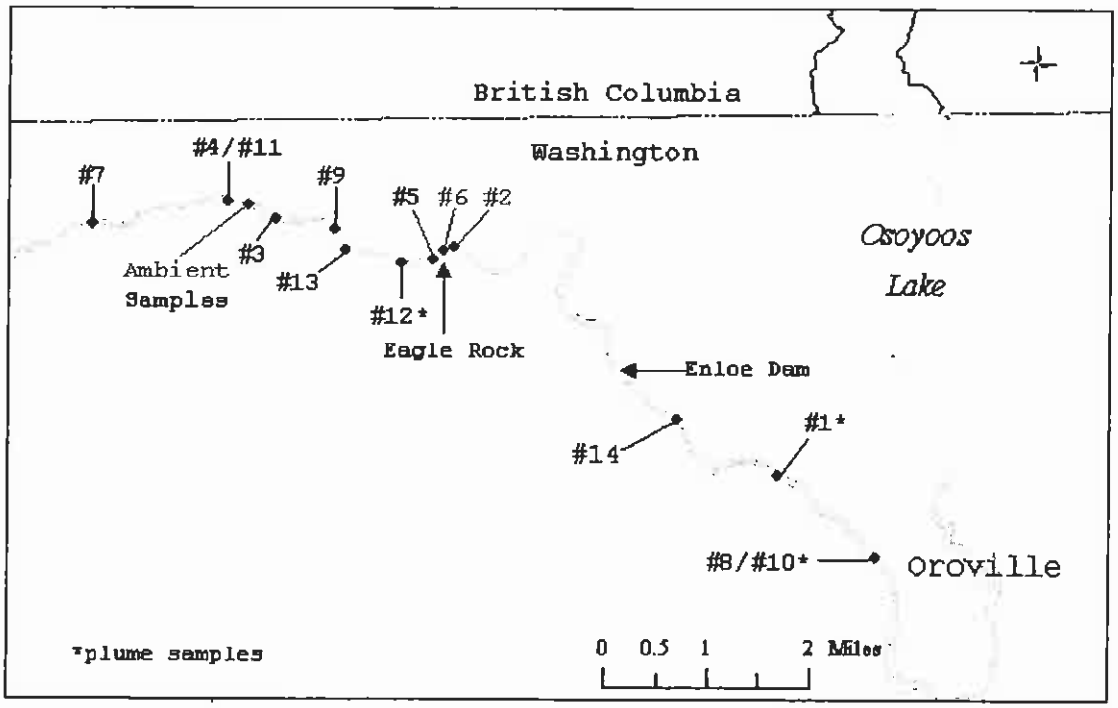

Figure 5. Locations of Gold Dredge Samples Collected in the Similkameen River during 2004

Three replicate samples were collected on each of the above dates and analyzed for total recoverable[3] and dissolved arsenic, copper, lead, and zinc, turbidity, and hardness. In addition to establishing background conditions, the results provided information on particulate vs. dissolved metals which was needed to evaluate the effluent data.

Effluent Samples

Dredging primarily occurs from a few miles below Nighthawk (r.m. 17.5) down to Oroville near the mouth of the river. Dredges operating at the 14 sites shown in Figure 5 were opportunistically sampled. An attempt was made to distribute the sampling effort equally up and down the river. No samples were obtained in the reservoir behind Enloe Dam as dredges normally do not operate there.

A single sample was collected from each dredge at the point the discharge left the sluice box. For dredge operations where the turbidity plume was being sampled, three effluent samples were collected.

In an effort to obtain a representative time-dependent composite, the effluent samples were collected by filling a one-liter sample bottle in small increments over a five-to-ten minute period. The samples were allowed to settle for approximately one hour and then ½ liter decanted into sample containers. This procedure removed sand and other large particles that would normally settle out of the water column. A settling time of one hour was selected based on the settleable solids analysis in EPA Method 160.5.

The effluents were analyzed for total recoverable arsenic, copper, lead, and zinc.

For selected dredges, the effluent flow rate was estimated from discharge velocity measurements and the dimensions of the sluice box. River velocity and substrate characteristics were also recorded.

Detailed information on the location of the effluent sampling sites, dredge descriptions, flows, and substrate characteristics can be found in Appendix C.

Plume Samples

The plumes from three dredges operating under different flow regimes – one each in July, August, and September – were sampled to gage the downstream extent of the impacted area (Figure 5). Three samples each were collected at 10, 50, and 200 feet below the dredge, staggered over approximately a 30-minute period. A marked polyethylene line with a float at the far end was attached to the back of the dredge to locate downstream sampling points. The distance of the furthest downstream sample was based on the *Gold and Fish* pamphlet requirement that dredges be separated by 200 feet.

[3] Total recoverable metals refers to a laboratory procedure where a sample is subjected to strong acid digestion prior to analysis. A total metals analysis employs a more thorough digestion of the sample. A total recoverable analysis is typically done for surface water samples and, for present purposes, is essentially equivalent to total metals.

Three separate effluent samples were collected at the same time the plume was being sampled. A single sample was also collected immediately upstream of the dredge suction hose for comparison with the plume. The effluent was analyzed for total recoverable metals.

The upstream and plume samples were analyzed for total recoverable arsenic, dissolved copper, lead, and zinc, TSS, turbidity, and hardness. Arsenic was analyzed as total recoverable for comparison to the human health standards, which are based on inorganic arsenic. Most of the arsenic in the Similkameen River water is in inorganic form (Johnson, 2002a). Measuring inorganic arsenic directly would have significantly increased the cost of the study. Total recoverable arsenic can reasonably be compared to the dissolved aquatic life criteria, since they differ only slightly from the older total recoverable criteria on which they are based. Copper, lead, and zinc were analyzed as dissolved for direct comparison with the aquatic life standards.

Number of Samples

The number and type of samples collected for this project are summarized in Table 2.

Table 2. Number and Type of Samples Collected for the 2004 Similkameen River Gold Dredge Study

Sample Type	No. of Sites	Samples per Site	Sub-total	Analyses
Ambient River	1	9	9	TR As, Cu, Pb, Zn; Diss Cu, Pb, Zn; TSS; turbidity; hardness
Above Dredge	14	1	14	TR As; Diss Cu, Pb, Zn; TSS; turbidity; hardness
Dredge Effluent	14	1-3	20	TR As, Cu, Pb, Zn
Dredge Plume	3	9	27	TR As; Diss Cu, Pb, Zn; TSS; turbidity; hardness
Bottle Blanks	1	3	3	TR As, Cu, Pb, Zn
Filter Blanks	1	3	3	Diss As, Cu, Pb, Zn
		Total =	76	

TR = total recoverable
Diss = dissolved

Field Procedures

Table 3 lists the sample size, container, preservation, and recommended holding time for each study parameter. Sample containers were obtained from Manchester Laboratory. Metals sampling procedures followed the guidance in EPA (1995) *Method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels*. All samples were taken as simple grabs or grab composites.

Table 3. Sample Containers, Preservation, and Holding Times for Water Samples

Parameter	Minimum Quality Required	Container	Preservative*	Holding Time
Metals	250 mL	500 mL Teflon bottle	HNO_3 to pH<2, 4°C	6 months
Hardness	100 mL	125 mL poly bottle	H_2SO4 to pH<2, 4°C	6 months
TSS	1,000 mL	1,000 mL poly bottle	Cool to 4°C	7 days
Turbidity	100 mL	500 mL poly bottle	Cool to 4°C	48 hours

*dissolved metals samples filtered in the field (0.45 micron)

Metals samples were collected directly into pre-cleaned 500 mL (plume and ambient samples) or 1 L (effluent samples) Teflon bottles. The effluent samples were allowed to settle and were then decanted, as previously described. Samples for dissolved metals were filtered in the field through a pre-cleaned 0.45 um Nalgene filter unit (#450-0045, type S). The filtrate was transferred to a new pre-cleaned 500 mL Teflon bottle. The whole water and filtered water samples were preserved to pH <2 with sub-boiled 1:1 nitric acid, carried in small Teflon vials. Teflon sample bottles, Nalgene filters, and Teflon acid vials were cleaned by Manchester, as described in Kammin et al. (1995), and sealed in plastic bags. Non-talc nitrile gloves were worn by personnel filtering the samples. Filtering was done in a glove box constructed of a PVC frame and polyethylene cover.

Flow was measured with a Marsh-McBirney meter and top-setting rod. A hand-held GPS was used to record sampling locations. All samples were placed in polyethylene bags, held on ice for transport to Ecology HQ, and then taken by courier to Manchester Laboratory within one to two days of collection. Chain-of-custody procedures were followed (Manchester Environmental Laboratory, 2003).

Laboratory Procedures

Table 4 shows the analytical methods used in this project.

Table 4. Laboratory Procedures

Analyte	Sample Matrix	Sample Prep Method	Analytical Method
Arsenic, Copper, Lead, Zinc	whole water	HNO_3/HCl digest	EPA 200.8
Copper, Lead, Zinc	filtered water	analyze directly	EPA 200.8
Hardness	whole water	N/A	EPA 200.7
TSS	whole water	N/A	EPA 160.2
Turbidity	whole water	N/A	EPA 180.1

N/A = not applicable

Manchester Laboratory prepared written quality assurance reviews on the quality of the chemical data for this project. The reviews include an assessment of sample condition on receipt at the laboratory, compliance with holding times, instrument calibration, procedural blanks, laboratory control samples, matrix spike and matrix spike duplicate recoveries, and duplicate sample analyses. No significant problems were encountered that compromise the accuracy, validity, or usefulness of the data. The quality assurance reviews and complete chemical data for this project are available from the author.

The precision of the data reported here can be assessed from results of duplicate analyses conducted on selected samples (Appendix D). Dissolved metal determinations agreed within 10%. Total recoverable metals agreed within approximately 20%, except 36% for zinc in one sample. Results for TSS, turbidity, and hardness were also in close agreement.

Field blanks were analyzed to detect metals contamination arising from sample containers or the filtration procedure. Bottle blanks were prepared at Manchester Laboratory by filling the Teflon sample bottles with deionized water. Filter blanks were prepared by filtering half the contents of a bottle blank. The field blanks were treated the same as samples.

Bottle and filter blanks were analyzed on three occasions during the project (Appendix E). There was a trace amount of zinc in the filter blanks (0.56 – 1.1 ug/L). The other metals were not detected in either type of blank. This demonstrates that the sample collection, preservation, and filtration procedures were not contributing significant amounts of metals to the samples.

River Flow

Figure 6 compares historical average flow in the Similkameen River with the flows encountered when samples were collected for the 2004 gold dredge study. The data are from USGS monitoring station #12442500 at Nighthawk.

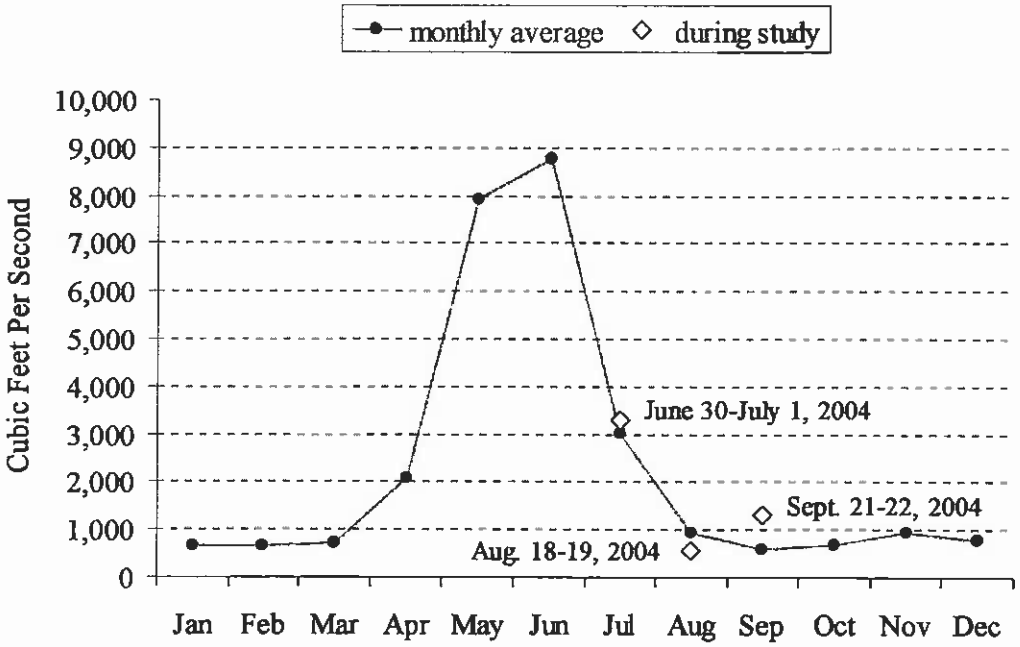

Figure 6. Monthly Average Flow in the Similkameen River, Showing Flows When Gold Dredge Samples were Collected (USGS station 12442500, 1928 – 2002).

As shown in Figure 6 and summarized below, river flows during gold dredge sampling were representative of the range of summer flows normally encountered in the Similkameen. Dry August weather resulted in low-flow conditions that were not anticipated to occur until the following month. Wet weather caused higher than normal discharge during the September sample collection.

Month	Average Flow	
	Historical	During Sampling
July	3,029 cfs	3,300 cfs
August	936 cfs	581 cfs
September	616 cfs	1,320 cfs

Ambient Water Quality

Ambient levels of TSS, turbidity, metals, and hardness measured in the Similkameen during the 2004 dredging season are summarized in Table 5. As previously described, these samples were collected in the upper part of the reach where dredging is done, but when no dredges were operating. Each data point represents results from three replicate samples. Variability within each sample set was minimal.

Table 5. Ambient Water Quality Conditions in the Similkameen River During the 2004 Gold Dredging Season [mean ± standard deviation of three replicates collected at river mile 14.0; no dredges operating]

Parameter	June 30	August 18	September 21	Overall Mean*
TSS (mg/L)	10 ± 0	3 ± 0.5	5 ± 0	6
Turbidity (NTU)	4.2 ± 0.4	2.2 ± 0.1	2.4 ± 0.05	2.9
Tot. Rec. Arsenic (ug/L)	3.9 ± 0.1	4.2 ± 0	2.2 ± 0.1	3.4
Dissolved Arsenic (ug/L)	2.7 ± 0.1	4.2 ± 0	1.8 ± 0	2.9
Tot. Rec. Copper (ug/L)	2.3 ± 0.2	1.2 ± 0	1.4 ± 0	1.6
Dissolved Copper (ug/L)	0.82 ± 0.05	0.84 ± 0.01	0.97 ± 0.1	0.88
Tot. Rec. Zinc (ug/L)	1.7 ± 0.1	<1.0	1.2 ± 0.1	1.3
Dissolved Zinc (ug/L)	0.92 ± 0.1	1.1 ± 0.1	2.2 ± 1.5	1.4
Tot. Rec. Lead (ug/L)	0.14 ± 0.02	<0.10	0.18 ± 0.01	0.14
Dissolved Lead (ug/L)	<0.02	<0.10	0.09 ± 0.05	0.07
Hardness (mg/L)	52 ± 0.4	82 ± 0.1	61 ± 0.02	65

*detection limit used for non-detects

TSS, turbidity, and total recoverable zinc, copper, and lead varied directly with flow. The levels were highest in July (September for lead) and lowest in August. The highest total recoverable arsenic concentrations were in August. Hardness varied inversely with flow, reflecting the relatively greater contribution of groundwater when river discharge is low.

TSS and turbidity ranged from 3 - 10 mg/L and 2.2 - 4.2 NTU, respectively. Concentrations of total recoverable metals ranged from 2.4 - 4.2 ug/L for arsenic, 1.2 - 2.3 ug/L for copper, <1.0 - 1.7 ug/L for zinc, and <0.10 - 0.18 ug/L for lead. Total recoverable zinc and lead were below detection limits during the low flows of August.

Dissolved metals concentrations were 1.8 - 4.2 ug/L for arsenic, 0.82 - 0.97 ug/L for copper, 0.92 - 2.2 ug/L for zinc, and <0.02 - 0.09 ug/L for lead. Because of a zinc background in the filtration procedure, the dissolved results slightly exceeded total recoverable in most of the August and September samples. Trace zinc contamination is frequently encountered when analyzing at the low ppb level.

These results are consistent with historical data on the Similkameen River (Appendix B; Johnson 1997, 2002a). At the time of the gold dredge study, ambient levels of dissolved arsenic, copper, lead, and zinc were one to two orders of magnitude lower than the aquatic life criteria (see Table 1). Total recoverable arsenic exceeded the more restrictive human health criteria by one to two orders of magnitude. As discussed earlier in this report, arsenic concentrations in most rivers and streams naturally exceed the EPA human health criteria, although to a lesser extent than in the Similkameen. There are no human health criteria for copper, lead, or zinc.

Dredge Effluents

Metals concentrations measured in effluents from gold dredges operating in the lower Similkameen River are shown in Table 6. These data are for total recoverable metals.

Table 6. Metals Concentrations in Effluent Samples from Gold Dredges Operating in the Similkameen River During 2004 [ug/L, total recoverable]

Site No.	Date	Arsenic	Copper	Zinc	Lead
#1	July 1	3.8	2.3	1.9	0.23
#2	July 1	6.2	6.1	5.2	0.69
#3	August 18	6.4	4.7	9.1	0.67
#4	August 18	6.6	9.3	9.4	0.97
#5	August 18	6.6	8.3	7.3	1.1
#6	August 18	6.3	5.1	4.2	1.3
#7	August 18	4.6	2.4	1.8	0.16
#8	August 18	7.4	4.4	3.3	0.47
#9	August 19	5.6	3.3	3.0	0.39
#10	August 19	7.3	3.7	4.4	0.46
#11	August 19	8.0	5.4	7.4	0.75
#12	September 21	2.6	2.9	2.0	0.47
#13	September 21	3.3	4.7	3.6	0.62
#14	September 22	2.6	2.0	1.8	0.26
	mean =	5.5	4.6	4.6	0.61
	minimum =	2.6	2.0	1.8	0.16
	maximum =	8.0	9.3	9.4	1.3

Although collected at 14 different locations and at varying stages in the dredging process, metals concentrations in the effluents did not differ greatly between sites. Minimum and maximum concentrations were within a factor of 2 for arsenic, factors of 4 - 5 for copper and zinc, and a factor of 8 for lead. Average concentrations were 5.5 ug/L arsenic, 4.6 ug/L copper, 4.6 ug/L zinc, and 0.61 ug/L lead. As described earlier, these samples were decanted, so did not include sand and other particles that would rapidly settle out of the water column following discharge.

Most of the effluent data are based on single samples composited over a five-to-ten minute period. Three separate composites were analyzed in conjunction with turbidity plume sampling at sites #1, #10, and #12. These samples were collected over a period of approximately 30 minutes (i.e., three five-to-ten minute composites per site) and also showed a low level of variability (Table 7). The average of the three composites is shown in Table 6.

Table 7. Variability of Replicate Gold Dredge Effluent Samples [ug/L, total recoverable]

Site No	Date	Time	Arsenic	Copper	Zinc	Lead
#1	July 1, 2004	115-1125	5.0	2.5	1.9	0.26
"	"	1335-1345	3.2	2.3	2.1	0.21
"	"	1155-1205	3.3	2.2	1.6	0.23
		mean ± s.d.=	3.8 ± 0.8	2.3 ± 0.1	1.9 ± 0.2	0.23 ± 0.02
#10	Aug 18, 2004	1513-1518	7.1	3.2	3.8	0.41
"	"	1523-1528	7.8	4.9	5.5	0.58
"	"	1538-1543	7.0	3.0	3.9	0.38
		mean ± s.d.=	7.3 ± 0.4	3.7 ± 0.9	4.4 ± 0.8	0.46 ± 0.1
#12	Sept 21, 2004	1330-1335	2.6	2.9	2.1	0.56
"	"	1338-1343	2.7	3.2	2.0	0.48
"	"	1345-1350	2.5	2.6	1.9	0.38
		mean ± s.d.=	2.6 ± 0.1	2.9 ± 0.2	2.0 ± 0.1	0.47 ± 0.1

A perspective on the potential these effluents have to affect metals concentrations in the river can be gained from a comparison with the ambient data (Figure 7). Zinc and lead appear to be the metals of greatest potential concern, with effluent concentrations being up to approximately 10 times higher than ambient levels. Arsenic, on the other hand, exceeded background by a factor of 2 or less, suggesting a minimal impact. These data indicate that the potential for these metals to be increased due to dredging in the Similkameen River is, in decreasing order, zinc, lead, copper, and arsenic.

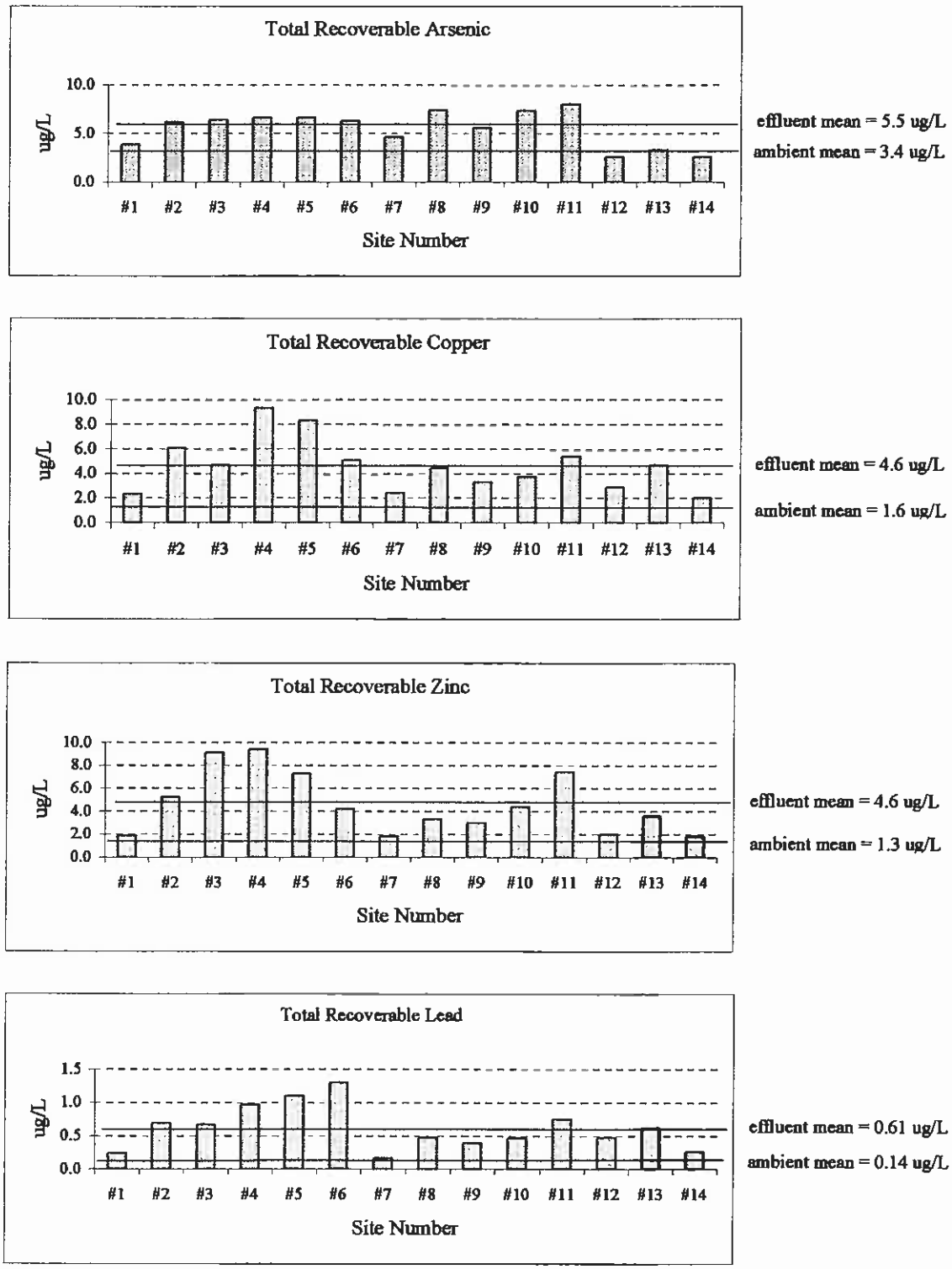

Figure 7. Metals Concentrations in Similkameen River Gold Dredge Effluents

Dredge Plumes

Turbidity plumes were sampled behind three gold dredges, one each at sites #1, #10, and #12. The results are summarized in Table 8. Each data point represents results from three replicate samples taken over approximately a 30-minute period. The effluent data are for total recoverable metals, while the plume and upstream data are for dissolved metals, except for total recoverable arsenic. (See Study Design for an explanation of analyzing total recoverable vs. dissolved metals.)

Table 8. Results from Sampling Gold Dredge Effluent Plumes in the Similkameen River During 2004 [mean ± standard deviation of three samples, except a single sample collected above each dredge]

Parameter	Turbidity (NTU)	TSS (mg/L)	Diss. Zinc (ug/L)	Diss. Copper (ug/L)	Diss. Lead (ug/L)	T.R. Arsenic (ug/L)	Hardness (mg/L)
Site #1, July 1							
Above dredge	4.3	10	<0.50	1.0	<0.02	3.7	52
Dredge effluent*	N/A	N/A	1.9 ± 0.2	2.3 ± 0.1	0.23 ± 0.02	3.8 ± 0.8	N/A
10 ft. downstream	10 ± 3.0	86 ± 45	1.1 ± 0.2	0.83 ± 0.02	<0.02**	9.8 ± 5.1	54 ± 1
50 ft. downstream	7.6 ± 3.0	68 ± 23	1.1 ± 0.2	0.83 ± 0.02	<0.02†	9.4 ± 5.4	54 ± 2
200 ft. downstream	5.2 ± 1.0	20 ± 3	0.6 ± 0.1	0.87 ± 0.09	<0.02	5.0 ± 0.7	53 ± 0.1
Site #10, August 18							
Above dredge	0.8	1	0.68	0.76	<0.10	5.3	88
Dredge effluent*	N/A	N/A	4.4 ± 0.8	3.7 ± 0.8	0.46 ± 0.09	7.3 ± 0.4	N/A
10 ft. downstream	12 ± 0.5	32 ± 7	2.0 ± 0.7	0.86 ± 0.01	<0.10	9.8 ± 1.9	90 ± 0.3
50 ft. downstream	3.6 ± 1.0	7 ± 2	1.3 ± 0.1	0.81 ± 0.01	<0.10	6.0 ± 0.1	89 ± 0.4
200 ft. downstream	1.4 ± 0.2	3 ± 0.5	1.1 ± 0.2	0.81 ± 0.01	<0.10	5.4 ± 0	88 ± 0.3
Site #12, September 21							
Above dredge	3.0	7	<0.50	0.94	0.032	2.2	59
Dredge effluent*	N/A	N/A	2.0 ± 0.08	2.9 ± 0.2	0.47 ± 0.07	2.6 ± 0.1	N/A
10 ft. downstream	11 ± 0.5	44 ± 9	0.88 ± 0.1	0.99 ± 0.01	0.039 ± 0.001	4.0 ± 0.4	60 ± 0
50 ft. downstream	6.9 ± 0.1	23 ± 3	2.8 ± 0.9	1.1 ± 0.1	0.040 ± 0.003	2.8 ± 0.1	59 ± 0
200 ft. downstream	4.0 ± 0.9	8 ± 2	0.93 ± 0.3	0.94 ± 0.01	0.035 ± 0.002	2.4 ± 0.1	59 ± 0

N/A = not analyzed
*dredge effluent data are total recoverable metals
**one detection at 0.028 ug/L
†one detection at 0.027 ug/L

River flows at the time of sample collection were 3,300 cfs (site #1), 581 cfs (site #10), and 1,320 cfs (site #12). Current velocities at the dredge sites ranged from 1.5 to 2.5 feet per second, and water depths were between 1.5 and 4 feet. The substrates were cobble with varying amounts of sand and gravel.

Downstream changes in the plume can be better visualized in Figure 8 which plots average TSS, turbidity, and metals concentrations. Zinc was below detection limits in the August and September upstream samples, and lead was below detection limits in most of the July and August samples. The detection limit was plotted where these metals were not detected.

Table 9 compares the upstream TSS, turbidity, and metals concentrations with the average concentrations measured in the furthest downstream samples 200 feet below the dredge. The differences between the three sites illustrate the variability inherent in a dredge plume mixing under different conditions of river flow and turbulence.

Table 9. Percent Increases in TSS, Turbidity, and Metals Concentrations Measured 200 Feet Below Three Gold Dredges in the Similkameen River

Site No.	TSS (mg/L)	Turbidity (NTU)	Tot. Rec Arsenic (ug/L)	Dissolved Copper (ug/L)	Dissolved Zinc (ug/L)	Dissolved Lead (ug/L)
#1	100	21	35	0	20	ND
#10	200	75	2	7	62	ND
#12	14	33	9	0	86	9
mean =	100	43	15	2	56	9

ND = not detected

At 200 feet, complete mixing with the river had not occurred. On average, TSS concentrations 200 feet downstream of the dredges were twice as high (100% increase) as upstream of the dredges. Turbidity and dissolved zinc levels at 200 feet were half again as high as upstream (43 – 56% average increase). There was only a modest increase in arsenic, copper, and lead (2 – 15%).

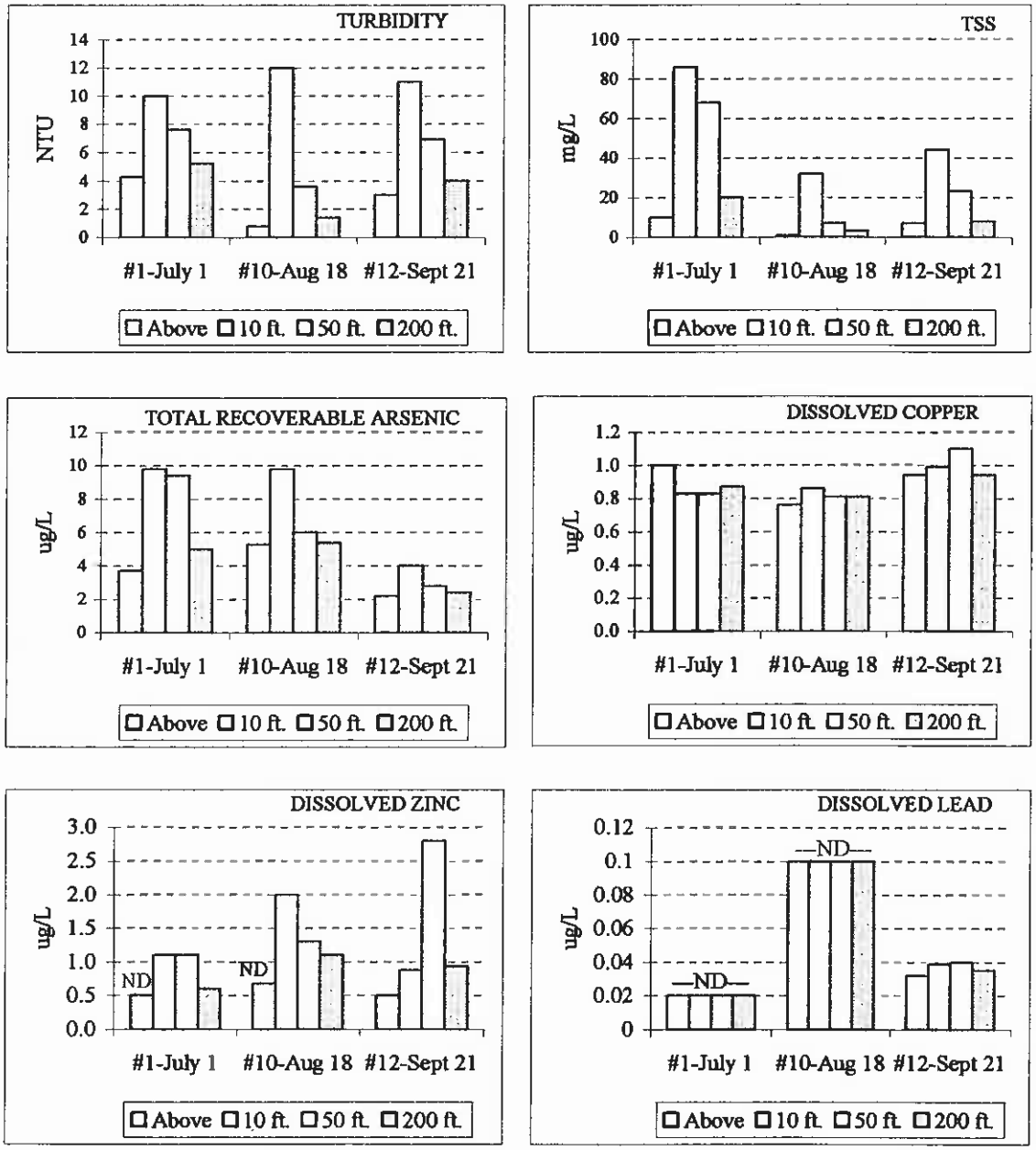

Figure 8. TSS, Turbidity, and Metals Concentrations Below Three Gold Dredges in the Similkameen River (mean of three grabs; ND = not detected).

Comparison with Water Quality Criteria

Table 10 compares the metals concentrations measured in Similkameen gold dredge effluents and dredge plumes with Washington state criteria for the protection of aquatic life. Copper, lead, and zinc toxicity varies inversely with hardness. The criteria were calculated for a hardness of 52 mg/L, the lowest recorded in the study.

Table 10. Metals Concentrations in Similkameen River Dredge Effluent and Plume Samples Compared to Criteria for Protection of Aquatic Life (ug/L)

	Arsenic	Copper	Lead	Zinc
Concentration Range in Effluents* (n=18)	2.6 - 8.0	2.0 - 9.3	0.16 - 1.3	1.8 - 9.4
Concentration Range Measured in Plume† (n=27)	2.3 - 17	0.79 - 1.2	<0.02 - 0.043	<0.5 - 4.1
Acute water quality criterion**	360	9.2	31	66
Chronic water quality criterion**	190	6.5	1.2	60

*total recoverable metals
†dissolved metals except total recoverable arsenic
**dissolved metals at 52 mg/L hardness (lowest recorded in study)

Based on analyzing 14 effluents and 27 plume samples, it appears that small-scale gold dredges have little or no potential to cause exceedances of aquatic life criteria in the Similkameen River. Arsenic and zinc concentration in dredge related samples were one to two orders of magnitude lower than criteria. Copper and lead concentrations were at or below criteria, except for one or two effluent samples that slightly exceeded (sites #4, #5, and #7).

The criteria comparison in Table 10 is a worst-case assessment in several respects:

1. Metals concentrations in the effluents and plumes would be subjected to further dilution in the river.
2. Subsamples for the effluent composites were only taken when the suction hose was in contact with the streambed. A true time-weighted composite would have included subsamples when the intake was lifted off the bottom – as periodically occurs – and only river water was being pumped through the dredge, resulting in lower average concentrations in the discharge.
3. Less restrictive water quality criteria would apply at other times of the dredging season when hardness levels are higher. For example, the acute criteria for copper increase from 6.5 to 9.6 ug/L going from a hardness of 52 mg/L (June 2004) to 82 mg/L (August 2004).
4. Once the effluents are discharged, the metals will partition into dissolved and particulate fractions. The dissolved fraction is the primary toxicity concern.

As previously described, ambient arsenic concentrations in the Similkameen River substantially exceed the Washington State human health criteria of 0.018 and 0.14 ug/L, due to natural conditions which have been exacerbated by historic land-based mining activity. The relative impact of dredge effluents on the already elevated arsenic concentrations in the river is assessed below.

Effect of Multiple Dredges

The metals concentrations measured in gold dredge effluents during the present study were at or below aquatic life criteria. Therefore, criteria exceedances would not be anticipated in the Similkameen River, regardless of the number of dredges operating. A series of dilution calculations were done to estimate what effect multiple dredges would have on metals concentrations in the river. As a point of reference, the maximum number of dredges Ecology personnel have observed on the Similkameen is approximately 20.

The calculations were done for both the average September flow and the 7-day, 10-year low flow, 616 cfs and 182 cfs, respectively (USGS Nighthawk gage). The August ambient data (Table 5) were used for the upstream metals concentrations. At that time the river was at 581 cfs. The detection limit was used for zinc and lead.

Average metal concentrations were used for the dredge effluents (Table 6), adjusted for the fraction that would be expected to be in the dissolved phase (based on the dissolved/total recoverable ratios in Table 5). Effluent flow rates ranged from 0.4 - 1.2 cfs, averaging 0.7 cfs (Appendix C); 1.0 cfs was used in the calculations. It was assumed the dredges operated continuously.

The results of the dilution calculations are in Table 11. During average September flows, it is estimated that somewhere between 17 and 57 dredges operating continuously would be required to increase dissolved zinc, lead, and copper concentrations in the Similkameen River by 10%. It would take between approximately 200 and 520 dredges to have the same effect on total recoverable and dissolved arsenic, respectively. In order for zinc, lead, or copper concentrations to be doubled in the river, anywhere from 170 to 570 dredges would need to be operating. Arsenic concentrations in the dredge effluents are too low to cause an increase of that magnitude, regardless of river flow.

At the 7-day, 10-year low flow in the Similkameen, relatively few dredges could effect a 10% change in copper, lead, and zinc concentrations. It would take 50 or more continuously operating dredges to double concentrations of these metals.

As demonstrated elsewhere in this report, a 100% increase in the ambient arsenic, copper, lead, or zinc concentrations in the Similkameen River would not result in exceedances of aquatic life criteria.

Table 11. Estimated Number of Dredges Required to Increase Metals Concentrations in the Similkameen River by 1%, 10%, and 100% [see text for assumptions and data used]

	@ Average September Flow - 616 cfs		
	1%	10%	100%
Tot. Rec. Arsenic	20	200	**
Dissolved Arsenic	52	520	**
Dissolved Copper	6	57	570
Dissolved Lead	3	31	310
Dissolved Zinc	2	17	170

	@ 7-Day, 10-Year Low Flow - 182 cfs		
	1%	10%	100%
Tot. Rec. Arsenic	6	59	**
Dissolved Arsenic	15	150	**
Dissolved Copper	2	17	170
Dissolved Lead	1	9	92
Dissolved Zinc	1	5	51

**effluent concentration too low to result in 100% increase

Results of this study show that the concentrations of arsenic, copper, lead, and zinc discharged from small-scale gold dredges operating in the Similkameen River are not a significant toxicity concern for aquatic life. Although this activity will exacerbate the exceedances of the arsenic human health criteria that already occur, it would take very large numbers of dredges to effect a 10% change in the river's arsenic levels, even at low-flow conditions.

These conclusions may not apply to the sediment deposits behind Enloe Dam. This material could have different physical/chemical properties that the sediments evaluated in the present study.

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Appendices

A. Results from Analyzing Metals and Organic Compounds in Similkameen River Sediment Samples

B. Metals Data for Ecology Routine Monitoring Station 49B070, Similkameen River at Oroville

C. Site Locations and Other Information on the Similkameen River Gold Dredge Samples

D. Results on Laboratory Duplicates for the Similkameen River Gold Dredge Study

E. Results on Field Blanks for the Similkameen River Gold Dredge Study

Appendix A-1. Results of Metals and Cyanide Analyses on Similkameen River Sediment Samples (mg/Kg, dry weight)

Site No.	Date	Sample No.	Depth Interval	Iron	Aluminum	Manganese	Zinc	Copper	Arsenic	Chromium	Nickel	Lead	Cadmium
						UPPER RIVER							
1	29-Aug-95	358246	0-2 cm	**12900**	**7030**	**236**	**35**	**22**	**12**	**12**	**12**	**2.4**	0.3 U
2	23-Aug-98	398060	0-10 cm	**14000**	**6980**	NA	**32**	**25**	**11**	**13**	**11**	**3.3**	0.5 U
						PALMER LAKE - NIGHTHAWK							
3	24-Aug-98	398061	0-10 cm	**15700**	**7790**	NA	**35**	**28**	**17**	**15**	**15**	**3.9**	0.5 U
4	30-Aug-95	358244	0-2 cm	**19500**	**10700**	**389**	**56**	**60**	**30**	**21**	**19**	**5.4**	0.3 U
4	24-Aug-98	398062	0-10 cm	**19900**	**10100**	NA	**48**	**51**	**43**	**22**	**19**	**5.4**	0.5 U
5	30-Aug-95	358243	0-2 cm	**17000**	**8490**	**300**	**46**	**43**	**46**	**18**	**17**	**4.5**	0.3 U
5	24-Aug-98	398063	0-10 cm	**13400**	**7040**	NA	**29**	**17**	**9.5**	**11**	**9.1**	**2.4**	0.5 U
						EAGLE ROCK							
6	24-Aug-98	398064	0-10 cm	**14700**	**7230**	NA	**33**	**24**	**19**	**13**	**12**	**3.0**	0.5 U
						ENLOE DAM							
7	23-Aug-98	398065	0-10 cm	**14200**	**7080**	NA	**31**	**18**	**12**	**13**	**12**	**2.4**	0.5 UJ
7	30-Sep-99	408020	0-1 ft	NA	NA	NA	**36**	**21**	**15**	**15**	**11**	**3.2**	**1.1**
7	30-Sep-99	408021	1-2 ft	NA	NA	NA	**31**	**13**	**7**	**11**	**7.8**	**2.0**	**0.86**
8	30-Sep-99	408022	0-1 ft	NA	NA	NA	**32**	**13**	**7.8**	**12**	**8.6**	**2.2**	**0.81**
8	30-Sep-99	408023	1-2 ft	NA	NA	NA	**30**	**12**	**7.2**	**11**	**7.9**	**2.0**	**0.79**
9	30-Aug-95	358242	0-2 cm	**16200**	**8940**	**305**	**50**	**45**	**21**	**18**	**16**	**4.1**	0.3 U
9	23-Aug-98	398066	0-10 cm	**14600**	**7275**	NA	**32**	**21**	**14**	**14**	**12**	**2.8**	0.5 U
9	30-Sep-99	408024	0-1 ft	NA	NA	NA	**33**	**17**	**10**	**13**	**9.2**	**2.3**	**0.94**

Note: Detections highlighted in **BOLD**
NA = not analyzed
U = not detected at or above reported value
J = estimated value
UJ = not detected at or above reported estimated value

Appendix A-1. (continued)

Site No.	Date	Sample No.	Depth Interval	Silver	Beryllium	Thallium	Mercury	Antimony	Selenium	Cyanide
				UPPER RIVER						
1	29-Aug-95	358246	0-2 cm	0.3 U	NA	NA	0.01 U	NA	0.4 U	NA
2	23-Aug-98	398060	0-10 cm	**0.66**	**0.24**	**0.38** J	**0.012**	4 UJ	0.3 U	0.10 U
				PALMER LAKE - NIGHTHAWK						
3	24-Aug-98	398061	0-10 cm	**0.78**	**0.28**	**0.50** J	**0.018** J	4 UJ	0.3 U	0.10 U
4	30-Aug-95	358244	0-2 cm	**0.30** J	NA	NA	**0.012**	NA	0.4 U	NA
4	24-Aug-98	398062	0-10 cm	**0.83**	**0.38**	0.3 U	**0.029**	4 UJ	0.3 U	0.10 U
5	30-Aug-95	358243	0-2 cm	**0.30** J	NA	NA	0.01 U	NA	0.4 U	NA
5	24-Aug-98	398063	0-10 cm	**0.59**	**0.24**	0.3 U	**0.031**	4 UJ	0.3 U	0.10 U
				EAGLE ROCK						
6	24-Aug-98	398064	0-10 cm	**0.74**	**0.23**	0.3 U	**0.0085**	4 UJ	0.3 U	0.10 U
				ENLOE DAM RESERVOIR						
7	23-Aug-98	398065	0-10 cm	**0.58**	**0.21**	0.3 U	**0.0072**	4 UJ	0.3 U	0.10 U
7	30-Sep-99	408020	0-1 ft	2 U	**1.3**	0.3 U	**0.013**	5 UJ	0.3 U	NA
7	30-Sep-99	408021	1-2 ft	2 U	**0.97**	0.3 U	0.01 U	5 UJ	0.3 U	NA
8	30-Sep-99	408022	0-1 ft	2 U	**1.2**	0.3 U	0.01 U	5 UJ	0.3 U	NA
8	30-Sep-99	408023	1-2 ft	2 U	**1.0**	0.3 U	0.01 U	5 UJ	0.3 U	NA
9	30-Aug-95	358242	0-2 cm	0.3 U	NA	NA	**0.012**	NA	0.4 U	NA
9	23-Aug-98	398066	0-10 cm	**0.73**	**0.23**	0.3 U	**0.014** J	4 UJ	0.3 U	0.10 U
9	30-Sep-99	408024	0-1 ft	2 U	**1.1**	0.3 U	0.01 U	5 UJ	0.3 U	NA

Note: Detections highlighted in **BOLD**
NA = not analyzed
U = not detected at or above reported value
J = estimated value
UJ = not detected at or above reported estimated value

Appendix A-2. Results from Analyzing Semivolatiles, PCBs, and Pesticides in Core Samples Collected behind Enloe Dam in September 1999 (ug/Kg, dry weight; only detected compounds shown)

Site No:	7		8		9
Location:	Upper Reservoir		Middle Reservoir		Lower Res
Depth Interval (cm):	0-30	30-60	0-30	30-60	0-30
Sample No:	408020	408021	408022	408023	408024
Semivolatiles					
Polyaromatic Hydrocarbons					
Naphthalene	**13**	6.7 U	**7.8** J	12 U	**7.9** J
1-Methylnaphthalene	**14**	6.7 U	**5.8** J	**5.6** J	**7.6** J
2-Methylnaphthalene	**17**	6.7 U	**9.2** J	**8.2** J	**10** J
Fluorene	**8.9** J	6.7 U	12 U	12 U	12 U
Phenanthrene	**55**	**4.2** J	**8.9** J	**8.0** J	**12** J
Anthracene	**23**	6.7 U	12 U	12 U	12 U
Fluoranthene	13 U	**4.2** J	**8.7** J	12 U	**9.7** J
Pyrene	**8.4** J	6.7 U	**6.6** J	**6.3** J	**7.7** J
Benzo(a)anthracene	13 U	**5.2** J	12 U	**9.4** NJ	12 U
Chrysene	13 U	6.7 U	12 U	12 U	**9.6** J
Total PAH	**139**	**14**	**47**	**38**	**64**
Miscellaneous Compounds					
2-Methylphenol	**8.5**	6.7 U	12 U	12 U	**5.9** J
4-Chloro-3-Methylphenol	13 U	6.7 U	12 U	12 U	**17**
2-Nitroaniline	13 U	6.7 U	12 U	12 U	**36**
3-Nitroaniline	**49**	6.7 U	12 U	12 U	12 U
Dibenzofuran	**12** J	6.7 U	**6.4** J	**6.3** J	**7.0** J
Retene	**522**	**7.9**	**83**	**48**	**203**
Carbazole	**1.2** J	6.7 U	12 U	12 U	12 U
Di-N-butylphthalate	**3490** E	54 U	386 U	711 U	243 U
Butylbenzylphthalate	26 U	**10**	19 U	23 U	22 U
PCBs	ND	ND	ND	ND	ND
Chlorinated Pesticides	ND	ND	ND	ND	ND
Organophosphorus Pesticides	ND	ND	ND	ND	ND
Nitrogen Pesticides	ND	ND	ND	ND	ND

Note: Detections highlighted in **BOLD** NJ = evidence analyte is present; value is an estimate
U = not detected at or above reported value E = estimated value that exceeds the calibration
J = estimated value ND = not detected

Appendix B. Metals Data for Ecology Routine Monitoring Station 49B070, Similkameen River @ Oroville (ug/L)

Date	Arsenic		Cadmium		Chromium		Copper	
	Diss.	Tot. Rec.	Diss.	Tot. Rec.	Diss.	Tot. Rec.	Diss.	Tot. Rec.
09-Oct-95			0.04 U	0.1 U		1 U	0.609	0.7
11-Dec-95		21.6	0.04 U	0.1 U		4	2.51	10.1
12-Feb-96		1.94	0.02 U	0.1 U		5 U	0.972	1.5 B
15-Apr-96		3.6	0.077 J	0.1 U		1.5	5.21 J	5.2
11-Jun-96		6.27	0.022	0.1 U		1.4	1.39	6.3
13-Aug-96		3.78	0.04	0.1 U		0.4 U	0.846	1.3
15-Oct-96		2.77	0.019	0.1 U		0.4 U	0.759	1.1 J
10-Dec-96		1.9	0.019	0.1 U		0.4 U	0.48	0.7
15-Apr-97		2.04	0.02 U	0.1 U		0.27	1.21	2.3
10-Jun-97		8.28	0.02 U	0.1 U		1.4	1.44	8.7
12-Aug-97		4.18	0.02 U	0.1 U		0.2 U	0.881	1.1
15-Dec-98			0.02 U				0.554	
11-May-99			0.02 U				1.22	
02-May-00		3.4						
06-Jun-00		4.6						
11-Jul-00		2.1						
15-Aug-00	5.4	4.4						
05-Sep-00		3.3						
04-Oct-00		2.6						
08-Nov-00								
06-Dec-00								
17-Jan-01								
07-Feb-01								
07-Mar-01								
04-Apr-01	2.36	2.25						
09-May-01	1.6	2.35						
06-Jun-01								
08-Oct-02	3.09	3.07	0.1 U	0.1 U	0.42	0.5 U	0.81	0.99
03-Dec-02	2.06	1.93	0.02 U	0.1 U	0.75	0.5 U	0.51	0.75
04-Feb-03	1.73	1.61	0.02 U	0.1 U	0.3	0.5 U	0.74	1.01
08-Apr-03	1.64	1.7	0.1 U	0.1 U	0.5 U	0.5 U	0.5 U	1.39 J
03-Jun-03	1.5	4.33	0.02 U	0.1 U	0.25 U	1.3	1.18	4.57
05-Aug-03	6.37	5.61	0.02 U	0.1 U	0.4	0.5 U	0.77	0.98

B = The analyte was detected in the method blank.
U = The analyte was not detected at or above the reported result.
J = The analyte was positively identified. The associated numerical result is an estimate.

Appendix B. (continued)

Date	Lead		Mercury	Nickel		Zinc		Hardness
	Diss.	Tot. Rec.	Total	Diss.	Tot. Rec.	Diss.	Tot. Rec.	
09-Oct-95	0.03 U	0.1 U	0.001 U	1 U		1.1	5.9 B	86
11-Dec-95	0.362	1.5	0.001	1 U		5 U	14.1 B	82
12-Feb-96	0.025	0.1	0.001 U	0.586		1.2 B	5 U	76
15-Apr-96	0.72 J	0.8	0.002	1.62 J		4.2 B	4.8	63
11-Jun-96	0.032	0.8	0.004	0.508		1.1	10.8 B	43
13-Aug-96	0.02 U	1	0.001 U	0.615		1	3.4 B	78
15-Oct-96	0.087	0.1 U	0.002 U	0.6		1.4 J	3.5 J	98
10-Dec-96	0.03 U	0.2	0.001 U	0.5		0.76	4 J	95
15-Apr-97	0.02 U	0.2	0.002 U	0.73		0.49	14.6	95
10-Jun-97	0.03	0.9	0.002 U	0.562		3.37	13 J	45
12-Aug-97	0.039	0.2	0.002 U	0.602		1.81	2.2	87
15-Dec-98	0.02 U		0.002 U	0.898		0.77		112
11-May-99	0.027		0.003	0.665		1.4 J		66
02-May-00								
06-Jun-00								
11-Jul-00								
15-Aug-00								95.4
05-Sep-00								88.6
04-Oct-00								90.1
08-Nov-00								86.8
06-Dec-00								104
17-Jan-01								103
07-Feb-01								103
07-Mar-01								73.2
04-Apr-01								103
09-May-01								
06-Jun-01								46.7
08-Oct-02	0.02 U	0.14	0.002 U	0.49	0.81	1 U	5 U	94.6
03-Dec-02	0.036	0.1 U	0.0033	0.73	0.71	1 U	5 U	97.8
04-Feb-03	0.02 U	0.1 U	0.002 U	0.39	0.46	1 U	5 U	81.4
08-Apr-03	0.02 U	0.11	0.004 U	0.62	0.91	1.1	5 U	79.4
03-Jun-03	0.041	0.44	0.0066	0.39	1.33	1.3	5.7	38.3
05-Aug-03	0.02 U	0.1 U	0.002 U	0.54	0.66	1 U	5 U	94.7
								38.3

B = The analyte was detected in the method blank.
U = The analyte was not detected at or above the reported result.
J = The analyte was positively identified. The associated numerical result is an estimate.

Appendix C. Site Locations and Other Information on Similkameen River Gold Dredge Samples

Site No. Date Owner	Site Description	River Mile Latitude Longitude*	Dredge Description and Operation	Effluent Flow Stream Depth/Velocity† Substrate	Ecology Personnel
#1 1-Jul-04 Creegan	Approx. 500 ft. below BNRR bridge, left bank	6.5 48 56 54 119 27 40	"Precision" dredge, 5" intake reduced to 4", 250 gpm pump, 6-8 feet off bank	1.2 cfs 2.5 ft. / 2.3 fps cobble w/ gravel & sand	Peterschmidt Johnson
#2 1-Jul-04 Lease	Approx. 100 yards below Eagle Rock, left bank	10.8 48 58 58 119 32 05	Custom, 6" intake reduced to 4", 1,200-1,500 gpm pump, 6 feet off bank	1.2 cfs 3 ft. / 0.9 fps cobble w/ sand	Peterschmidt Johnson
#3 18-Aug-04 Ching	S-turn @ irrigation canal crossing, left bank	13.7 48 59 15 119 32 25	Stilt mounted, 2.5"intake, 6.5 hp, working in streamside hole	no data 1.5 ft. / 1.4 fps cobble and boulders	Coffin Latham
#4 18-Aug-04 Sweeney	Approx. 1/2 mile upstream of S-turn, left bank	14.1 48 59 20 119 34 36	Floating dredge, 3" intake, 5 hp pump, 3 feet off bank	no data 1 ft. / 0.9 fps boulders	Coffin Latham
#5 18-Aug-04 Hard	Approx. 1 mile above Eagle Rock, left bank	11.1 48 58 51 119 32 24	Floating dredge, 4" intake, 5 hp pump	no data 3 ft. / 2.2 fps bedrock w/ fines	Coffin Latham
#6 19-Aug-04 Franklin	Above Eagle Rock, left bank	10.9 48 58 53 119 32 17	"Keene" dredge, 4" intake, 5 hp pump	no data 1.3 ft. / 2.5 fps cobble and bedrock	Coffin Latham
#7 18-Aug-04 Estes	Approx. 2 miles below Nighthawk left bank	15.8 48 29 12 119 33 58	"Keene" triple sluice, 4" intake, 300-450 gpm, 20 feet off bank	no data 1.4 ft. / 0.35 fps large cobble w/ fines	Coffin Latham
#8 18-Aug-04 Wade	River Oaks RV Resort, left bank	5.2 48 56 13 119 26 35	"Dahlke Polydredge", 4" intake, 300 gpm, 5 hp pump, 20 feet off bank	1.0 cfs 1.5 ft / 0.5 fps cobble	Johnson Wittmeier

Appendix C. (continued)

Site No. Date Owner	Site Description	River Mile Latitude Longitude*	Dredge Description and Operation	Effluent Flow Stream Depth/Velocity† Substrate	Ecology Personnel
#9 19-Aug-04 - -	Approx. 1.5 miles above Eagle Rock, left bank	13 48 59 08 119 33 39	3" intake, 5.5 hp pump, 20 feet off bank	0.2 cfs 1.3 ft. / 0.7 fps cobble and gravel	Peterschmidt Johnson
#10 18-Aug-04 Wade	River Oaks RV Resort, left bank	5.2 48 56 13 119 26 35	"Dahlke Polydredge", 4" intake, 300 gpm, 5 hp pump, 20 feet off bank	1.0 cfs 1.5 ft / 0.5 fps cobble	Johnson Wittmeier
#11 19-Aug-04 - -	Approx. 1/2 mile above S-turn, left bank	14.3 48 59 20 119 34 50	Custom dredge, 4" intake, 5.5 hp pump, 30 feet off bank	0.4 cfs 2 ft. / 0.3 fps cobble	Peterschmidt Johnson
#12 21-Sep-04 Chase	"Boat ramp", left bank	13.3 48 58 50 119 32 32	Floating dredge, 4" intake, 7 hp pump, 10 feet off bank	0.5 cfs 1.5 ft. / 0.85 fps cobble and gravel	Peterschmidt Johnson
#13 21-Sep-04 Miltner	Approx. 1 mile above Eagle Rock, left bank	12.8 48 58 54 119 33 24	Floating dredge, 4" intake, 5.5 hp pump, 10 feet off bank	0.4 cfs 0.9 ft. / 1.3 fps cobble w/ gravel & silt	Peterschmidt Johnson
#14 22-Sep-04 - -	Approx. 1 mile below Enloe Dam, left bank	8.5 48 57 41 119 29 46	Floating dredge, 2.4 inch intake, 6.5 hp pump, 15 feet off bank	- - - - boulders	Peterschmidt

*NAD 27

†immediately upstream of dredge intake hose

Three replicate samples were collected on each of the above dates and analyzed for total recoverable[3] and dissolved arsenic, copper, lead, and zinc, turbidity, and hardness. In addition to establishing background conditions, the results provided information on particulate vs. dissolved metals which was needed to evaluate the effluent data.

Effluent Samples

Dredging primarily occurs from a few miles below Nighthawk (r.m. 17.5) down to Oroville near the mouth of the river. Dredges operating at the 14 sites shown in Figure 5 were opportunistically sampled. An attempt was made to distribute the sampling effort equally up and down the river. No samples were obtained in the reservoir behind Enloe Dam as dredges normally do not operate there.

A single sample was collected from each dredge at the point the discharge left the sluice box. For dredge operations where the turbidity plume was being sampled, three effluent samples were collected.

In an effort to obtain a representative time-dependent composite, the effluent samples were collected by filling a one-liter sample bottle in small increments over a five-to-ten minute period. The samples were allowed to settle for approximately one hour and then ½ liter decanted into sample containers. This procedure removed sand and other large particles that would normally settle out of the water column. A settling time of one hour was selected based on the settleable solids analysis in EPA Method 160.5.

The effluents were analyzed for total recoverable arsenic, copper, lead, and zinc.

For selected dredges, the effluent flow rate was estimated from discharge velocity measurements and the dimensions of the sluice box. River velocity and substrate characteristics were also recorded.

Detailed information on the location of the effluent sampling sites, dredge descriptions, flows, and substrate characteristics can be found in Appendix C.

Plume Samples

The plumes from three dredges operating under different flow regimes – one each in July, August, and September – were sampled to gage the downstream extent of the impacted area (Figure 5). Three samples each were collected at 10, 50, and 200 feet below the dredge, staggered over approximately a 30-minute period. A marked polyethylene line with a float at the far end was attached to the back of the dredge to locate downstream sampling points. The distance of the furthest downstream sample was based on the *Gold and Fish* pamphlet requirement that dredges be separated by 200 feet.

[3] Total recoverable metals refers to a laboratory procedure where a sample is subjected to strong acid digestion prior to analysis. A total metals analysis employs a more thorough digestion of the sample. A total recoverable analysis is typically done for surface water samples and, for present purposes, is essentially equivalent to total metals.

Three separate effluent samples were collected at the same time the plume was being sampled. A single sample was also collected immediately upstream of the dredge suction hose for comparison with the plume. The effluent was analyzed for total recoverable metals.

The upstream and plume samples were analyzed for total recoverable arsenic, dissolved copper, lead, and zinc, TSS, turbidity, and hardness. Arsenic was analyzed as total recoverable for comparison to the human health standards, which are based on inorganic arsenic. Most of the arsenic in the Similkameen River water is in inorganic form (Johnson, 2002a). Measuring inorganic arsenic directly would have significantly increased the cost of the study. Total recoverable arsenic can reasonably be compared to the dissolved aquatic life criteria, since they differ only slightly from the older total recoverable criteria on which they are based. Copper, lead, and zinc were analyzed as dissolved for direct comparison with the aquatic life standards.

Number of Samples

The number and type of samples collected for this project are summarized in Table 2.

Table 2. Number and Type of Samples Collected for the 2004 Similkameen River Gold Dredge Study

Sample Type	No. of Sites	Samples per Site	Sub-total	Analyses
Ambient River	1	9	9	TR As, Cu, Pb, Zn; Diss Cu, Pb, Zn; TSS; turbidity; hardness
Above Dredge	14	1	14	TR As; Diss Cu, Pb, Zn; TSS; turbidity; hardness
Dredge Effluent	14	1-3	20	TR As, Cu, Pb, Zn
Dredge Plume	3	9	27	TR As; Diss Cu, Pb, Zn; TSS; turbidity; hardness
Bottle Blanks	1	3	3	TR As, Cu, Pb, Zn
Filter Blanks	1	3	3	Diss As, Cu, Pb, Zn
		Total =	76	

TR = total recoverable
Diss = dissolved

Field Procedures

Table 3 lists the sample size, container, preservation, and recommended holding time for each study parameter. Sample containers were obtained from Manchester Laboratory. Metals sampling procedures followed the guidance in EPA (1995) *Method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels*. All samples were taken as simple grabs or grab composites.

Table 3. Sample Containers, Preservation, and Holding Times for Water Samples

Parameter	Minimum Quality Required	Container	Preservative*	Holding Time
Metals	250 mL	500 mL Teflon bottle	HNO_3 to pH<2, 4°C	6 months
Hardness	100 mL	125 mL poly bottle	H_2SO4 to pH<2, 4°C	6 months
TSS	1,000 mL	1,000 mL poly bottle	Cool to 4°C	7 days
Turbidity	100 mL	500 mL poly bottle	Cool to 4°C	48 hours

*dissolved metals samples filtered in the field (0.45 micron)

Metals samples were collected directly into pre-cleaned 500 mL (plume and ambient samples) or 1 L (effluent samples) Teflon bottles. The effluent samples were allowed to settle and were then decanted, as previously described. Samples for dissolved metals were filtered in the field through a pre-cleaned 0.45 um Nalgene filter unit (#450-0045, type S). The filtrate was transferred to a new pre-cleaned 500 mL Teflon bottle. The whole water and filtered water samples were preserved to pH <2 with sub-boiled 1:1 nitric acid, carried in small Teflon vials. Teflon sample bottles, Nalgene filters, and Teflon acid vials were cleaned by Manchester, as described in Kammin et al. (1995), and sealed in plastic bags. Non-talc nitrile gloves were worn by personnel filtering the samples. Filtering was done in a glove box constructed of a PVC frame and polyethylene cover.

Flow was measured with a Marsh-McBirney meter and top-setting rod. A hand-held GPS was used to record sampling locations. All samples were placed in polyethylene bags, held on ice for transport to Ecology HQ, and then taken by courier to Manchester Laboratory within one to two days of collection. Chain-of-custody procedures were followed (Manchester Environmental Laboratory, 2003).

Laboratory Procedures

Table 4 shows the analytical methods used in this project.

Table 4. Laboratory Procedures

Analyte	Sample Matrix	Sample Prep Method	Analytical Method
Arsenic, Copper, Lead, Zinc	whole water	HNO_3/HCl digest	EPA 200.8
Copper, Lead, Zinc	filtered water	analyze directly	EPA 200.8
Hardness	whole water	N/A	EPA 200.7
TSS	whole water	N/A	EPA 160.2
Turbidity	whole water	N/A	EPA 180.1

N/A = not applicable

Manchester Laboratory prepared written quality assurance reviews on the quality of the chemical data for this project. The reviews include an assessment of sample condition on receipt at the laboratory, compliance with holding times, instrument calibration, procedural blanks, laboratory control samples, matrix spike and matrix spike duplicate recoveries, and duplicate sample analyses. No significant problems were encountered that compromise the accuracy, validity, or usefulness of the data. The quality assurance reviews and complete chemical data for this project are available from the author.

The precision of the data reported here can be assessed from results of duplicate analyses conducted on selected samples (Appendix D). Dissolved metal determinations agreed within 10%. Total recoverable metals agreed within approximately 20%, except 36% for zinc in one sample. Results for TSS, turbidity, and hardness were also in close agreement.

Field blanks were analyzed to detect metals contamination arising from sample containers or the filtration procedure. Bottle blanks were prepared at Manchester Laboratory by filling the Teflon sample bottles with deionized water. Filter blanks were prepared by filtering half the contents of a bottle blank. The field blanks were treated the same as samples.

Bottle and filter blanks were analyzed on three occasions during the project (Appendix E). There was a trace amount of zinc in the filter blanks (0.56 – 1.1 ug/L). The other metals were not detected in either type of blank. This demonstrates that the sample collection, preservation, and filtration procedures were not contributing significant amounts of metals to the samples.

River Flow

Figure 6 compares historical average flow in the Similkameen River with the flows encountered when samples were collected for the 2004 gold dredge study. The data are from USGS monitoring station #12442500 at Nighthawk.

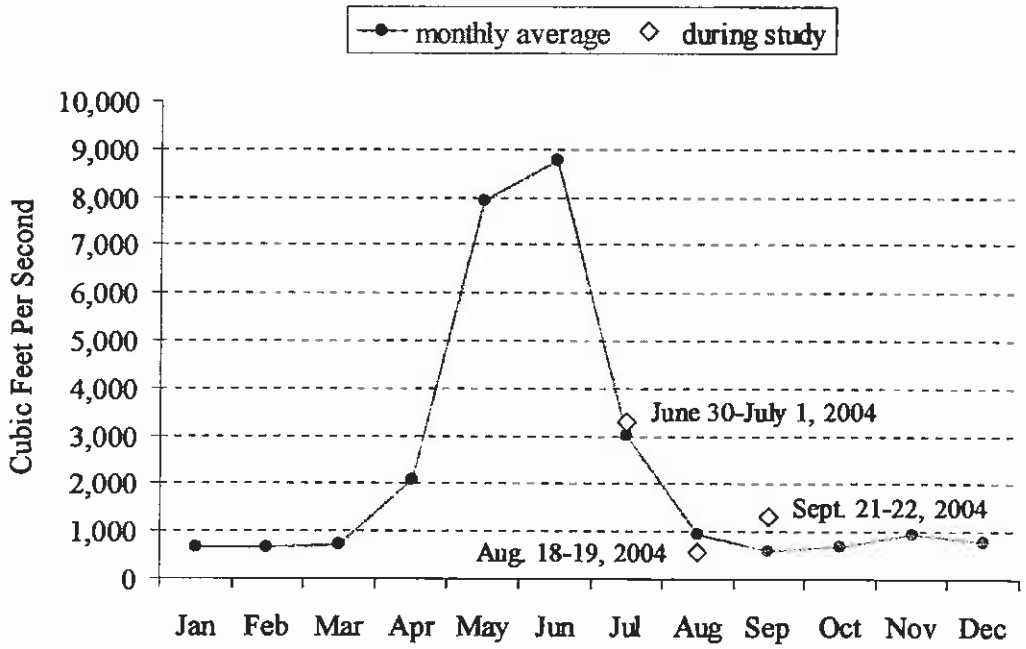

Figure 6. Monthly Average Flow in the Similkameen River, Showing Flows When Gold Dredge Samples were Collected (USGS station 12442500, 1928 – 2002).

As shown in Figure 6 and summarized below, river flows during gold dredge sampling were representative of the range of summer flows normally encountered in the Similkameen. Dry August weather resulted in low-flow conditions that were not anticipated to occur until the following month. Wet weather caused higher than normal discharge during the September sample collection.

Month	Average Flow	
	Historical	During Sampling
July	3,029 cfs	3,300 cfs
August	936 cfs	581 cfs
September	616 cfs	1,320 cfs

Ambient Water Quality

Ambient levels of TSS, turbidity, metals, and hardness measured in the Similkameen during the 2004 dredging season are summarized in Table 5. As previously described, these samples were collected in the upper part of the reach where dredging is done, but when no dredges were operating. Each data point represents results from three replicate samples. Variability within each sample set was minimal.

Table 5. Ambient Water Quality Conditions in the Similkameen River During the 2004 Gold Dredging Season [mean ± standard deviation of three replicates collected at river mile 14.0; no dredges operating]

Parameter	June 30	August 18	September 21	Overall Mean*
TSS (mg/L)	10 ± 0	3 ± 0.5	5 ± 0	6
Turbidity (NTU)	4.2 ± 0.4	2.2 ± 0.1	2.4 ± 0.05	2.9
Tot. Rec. Arsenic (ug/L)	3.9 ± 0.1	4.2 ± 0	2.2 ± 0.1	3.4
Dissolved Arsenic (ug/L)	2.7 ± 0.1	4.2 ± 0	1.8 ± 0	2.9
Tot. Rec. Copper (ug/L)	2.3 ± 0.2	1.2 ± 0	1.4 ± 0	1.6
Dissolved Copper (ug/L)	0.82 ± 0.05	0.84 ± 0.01	0.97 ± 0.1	0.88
Tot. Rec. Zinc (ug/L)	1.7 ± 0.1	<1.0	1.2 ± 0.1	1.3
Dissolved Zinc (ug/L)	0.92 ± 0.1	1.1 ± 0.1	2.2 ± 1.5	1.4
Tot. Rec. Lead (ug/L)	0.14 ± 0.02	<0.10	0.18 ± 0.01	0.14
Dissolved Lead (ug/L)	<0.02	<0.10	0.09 ± 0.05	0.07
Hardness (mg/L)	52 ± 0.4	82 ± 0.1	61 ± 0.02	65

*detection limit used for non-detects

TSS, turbidity, and total recoverable zinc, copper, and lead varied directly with flow. The levels were highest in July (September for lead) and lowest in August. The highest total recoverable arsenic concentrations were in August. Hardness varied inversely with flow, reflecting the relatively greater contribution of groundwater when river discharge is low.

TSS and turbidity ranged from 3 - 10 mg/L and 2.2 - 4.2 NTU, respectively. Concentrations of total recoverable metals ranged from 2.4 - 4.2 ug/L for arsenic, 1.2 - 2.3 ug/L for copper, <1.0 - 1.7 ug/L for zinc, and <0.10 - 0.18 ug/L for lead. Total recoverable zinc and lead were below detection limits during the low flows of August.

Dissolved metals concentrations were 1.8 - 4.2 ug/L for arsenic, 0.82 - 0.97 ug/L for copper, 0.92 - 2.2 ug/L for zinc, and <0.02 - 0.09 ug/L for lead. Because of a zinc background in the filtration procedure, the dissolved results slightly exceeded total recoverable in most of the August and September samples. Trace zinc contamination is frequently encountered when analyzing at the low ppb level.

These results are consistent with historical data on the Similkameen River (Appendix B; Johnson 1997, 2002a). At the time of the gold dredge study, ambient levels of dissolved arsenic, copper, lead, and zinc were one to two orders of magnitude lower than the aquatic life criteria (see Table 1). Total recoverable arsenic exceeded the more restrictive human health criteria by one to two orders of magnitude. As discussed earlier in this report, arsenic concentrations in most rivers and streams naturally exceed the EPA human health criteria, although to a lesser extent than in the Similkameen. There are no human health criteria for copper, lead, or zinc.

Dredge Effluents

Metals concentrations measured in effluents from gold dredges operating in the lower Similkameen River are shown in Table 6. These data are for total recoverable metals.

Table 6. Metals Concentrations in Effluent Samples from Gold Dredges Operating in the Similkameen River During 2004 [ug/L, total recoverable]

Site No.	Date	Arsenic	Copper	Zinc	Lead
#1	July 1	3.8	2.3	1.9	0.23
#2	July 1	6.2	6.1	5.2	0.69
#3	August 18	6.4	4.7	9.1	0.67
#4	August 18	6.6	9.3	9.4	0.97
#5	August 18	6.6	8.3	7.3	1.1
#6	August 18	6.3	5.1	4.2	1.3
#7	August 18	4.6	2.4	1.8	0.16
#8	August 18	7.4	4.4	3.3	0.47
#9	August 19	5.6	3.3	3.0	0.39
#10	August 19	7.3	3.7	4.4	0.46
#11	August 19	8.0	5.4	7.4	0.75
#12	September 21	2.6	2.9	2.0	0.47
#13	September 21	3.3	4.7	3.6	0.62
#14	September 22	2.6	2.0	1.8	0.26
	mean =	5.5	4.6	4.6	0.61
	minimum =	2.6	2.0	1.8	0.16
	maximum =	8.0	9.3	9.4	1.3

Although collected at 14 different locations and at varying stages in the dredging process, metals concentrations in the effluents did not differ greatly between sites. Minimum and maximum concentrations were within a factor of 2 for arsenic, factors of 4 - 5 for copper and zinc, and a factor of 8 for lead. Average concentrations were 5.5 ug/L arsenic, 4.6 ug/L copper, 4.6 ug/L zinc, and 0.61 ug/L lead. As described earlier, these samples were decanted, so did not include sand and other particles that would rapidly settle out of the water column following discharge.

Most of the effluent data are based on single samples composited over a five-to-ten minute period. Three separate composites were analyzed in conjunction with turbidity plume sampling at sites #1, #10, and #12. These samples were collected over a period of approximately 30 minutes (i.e., three five-to-ten minute composites per site) and also showed a low level of variability (Table 7). The average of the three composites is shown in Table 6.

Table 7. Variability of Replicate Gold Dredge Effluent Samples [ug/L, total recoverable]

Site No	Date	Time	Arsenic	Copper	Zinc	Lead
#1	July 1, 2004	115-1125	5.0	2.5	1.9	0.26
"	"	1335-1345	3.2	2.3	2.1	0.21
"	"	1155-1205	3.3	2.2	1.6	0.23
		mean ± s.d.=	3.8 ± 0.8	2.3 ± 0.1	1.9 ± 0.2	0.23 ± 0.02
#10	Aug 18, 2004	1513-1518	7.1	3.2	3.8	0.41
"	"	1523-1528	7.8	4.9	5.5	0.58
"	"	1538-1543	7.0	3.0	3.9	0.38
		mean ± s.d.=	7.3 ± 0.4	3.7 ± 0.9	4.4 ± 0.8	0.46 ± 0.1
#12	Sept 21, 2004	1330-1335	2.6	2.9	2.1	0.56
"	"	1338-1343	2.7	3.2	2.0	0.48
"	"	1345-1350	2.5	2.6	1.9	0.38
		mean ± s.d.=	2.6 ± 0.1	2.9 ± 0.2	2.0 ± 0.1	0.47 ± 0.1

A perspective on the potential these effluents have to affect metals concentrations in the river can be gained from a comparison with the ambient data (Figure 7). Zinc and lead appear to be the metals of greatest potential concern, with effluent concentrations being up to approximately 10 times higher than ambient levels. Arsenic, on the other hand, exceeded background by a factor of 2 or less, suggesting a minimal impact. These data indicate that the potential for these metals to be increased due to dredging in the Similkameen River is, in decreasing order, zinc, lead, copper, and arsenic.

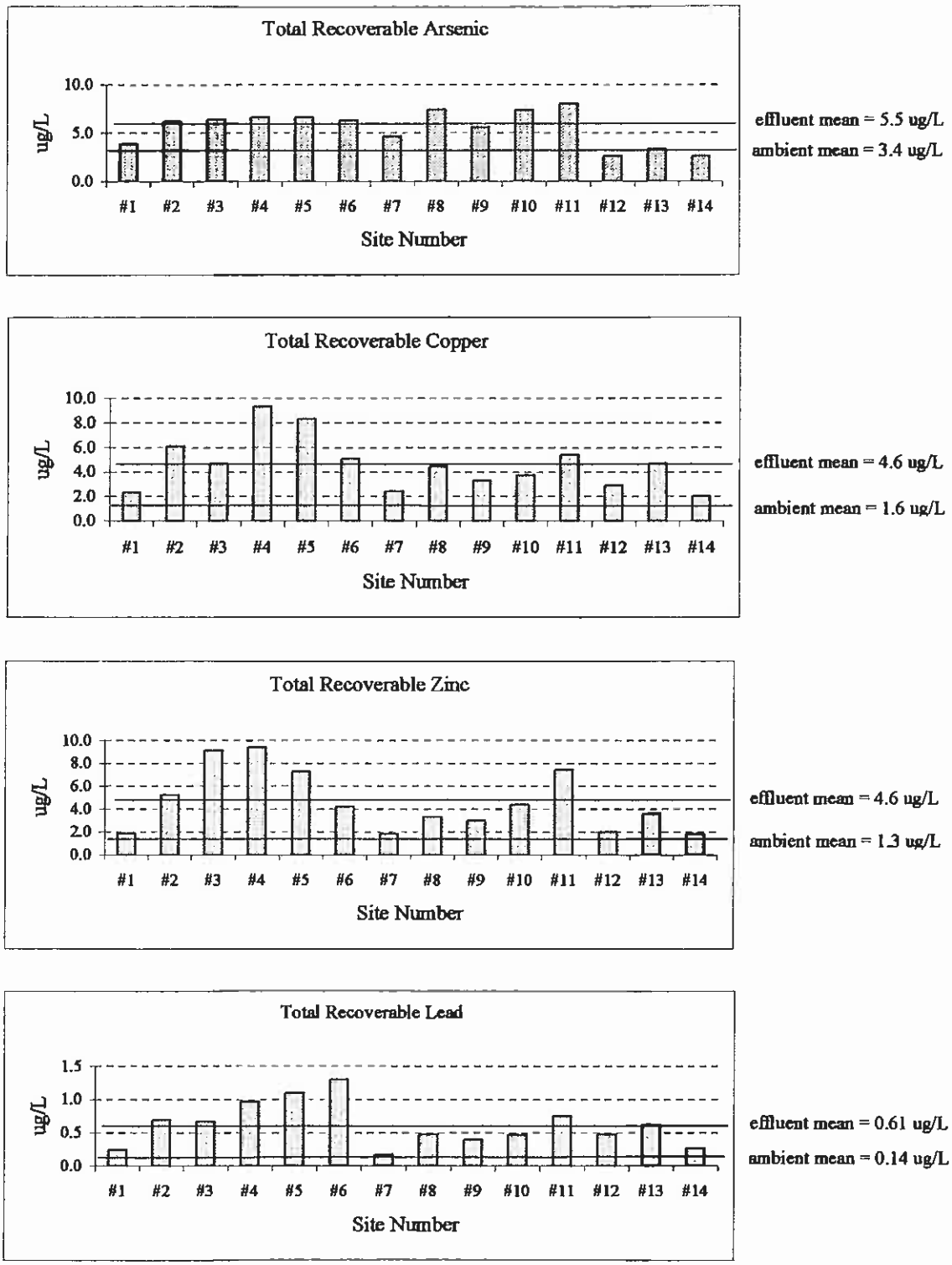

Figure 7. Metals Concentrations in Similkameen River Gold Dredge Effluents

Dredge Plumes

Turbidity plumes were sampled behind three gold dredges, one each at sites #1, #10, and #12. The results are summarized in Table 8. Each data point represents results from three replicate samples taken over approximately a 30-minute period. The effluent data are for total recoverable metals, while the plume and upstream data are for dissolved metals, except for total recoverable arsenic. (See Study Design for an explanation of analyzing total recoverable vs. dissolved metals.)

Table 8. Results from Sampling Gold Dredge Effluent Plumes in the Similkameen River During 2004 [mean ± standard deviation of three samples, except a single sample collected above each dredge]

Parameter	Turbidity (NTU)	TSS (mg/L)	Diss. Zinc (ug/L)	Diss. Copper (ug/L)	Diss. Lead (ug/L)	T.R. Arsenic (ug/L)	Hardness (mg/L)
Site #1, July 1							
Above dredge	4.3	10	<0.50	1.0	<0.02	3.7	52
Dredge effluent*	N/A	N/A	1.9 ± 0.2	2.3 ± 0.1	0.23 ± 0.02	3.8 ± 0.8	N/A
10 ft. downstream	10 ± 3.0	86 ± 45	1.1 ± 0.2	0.83 ± 0.02	<0.02**	9.8 ± 5.1	54 ± 1
50 ft. downstream	7.6 ± 3.0	68 ± 23	1.1 ± 0.2	0.83 ± 0.02	<0.02†	9.4 ± 5.4	54 ± 2
200 ft. downstream	5.2 ± 1.0	20 ± 3	0.6 ± 0.1	0.87 ± 0.09	<0.02	5.0 ± 0.7	53 ± 0.1
Site #10, August 18							
Above dredge	0.8	1	0.68	0.76	<0.10	5.3	88
Dredge effluent*	N/A	N/A	4.4 ± 0.8	3.7 ± 0.8	0.46 ± 0.09	7.3 ± 0.4	N/A
10 ft. downstream	12 ± 0.5	32 ± 7	2.0 ± 0.7	0.86 ± 0.01	<0.10	9.8 ± 1.9	90 ± 0.3
50 ft. downstream	3.6 ± 1.0	7 ± 2	1.3 ± 0.1	0.81 ± 0.01	<0.10	6.0 ± 0.1	89 ± 0.4
200 ft. downstream	1.4 ± 0.2	3 ± 0.5	1.1 ± 0.2	0.81 ± 0.01	<0.10	5.4 ± 0	88 ± 0.3
Site #12, September 21							
Above dredge	3.0	7	<0.50	0.94	0.032	2.2	59
Dredge effluent*	N/A	N/A	2.0 ± 0.08	2.9 ± 0.2	0.47 ± 0.07	2.6 ± 0.1	N/A
10 ft. downstream	11 ± 0.5	44 ± 9	0.88 ± 0.1	0.99 ± 0.01	0.039 ± 0.001	4.0 ± 0.4	60 ± 0
50 ft. downstream	6.9 ± 0.1	23 ± 3	2.8 ± 0.9	1.1 ± 0.1	0.040 ± 0.003	2.8 ± 0.1	59 ± 0
200 ft. downstream	4.0 ± 0.9	8 ± 2	0.93 ± 0.3	0.94 ± 0.01	0.035 ± 0.002	2.4 ± 0.1	59 ± 0

N/A = not analyzed
*dredge effluent data are total recoverable metals
**one detection at 0.028 ug/L
†one detection at 0.027 ug/L

River flows at the time of sample collection were 3,300 cfs (site #1), 581 cfs (site #10), and 1,320 cfs (site #12). Current velocities at the dredge sites ranged from 1.5 to 2.5 feet per second, and water depths were between 1.5 and 4 feet. The substrates were cobble with varying amounts of sand and gravel.

Downstream changes in the plume can be better visualized in Figure 8 which plots average TSS, turbidity, and metals concentrations. Zinc was below detection limits in the August and September upstream samples, and lead was below detection limits in most of the July and August samples. The detection limit was plotted where these metals were not detected.

Table 9 compares the upstream TSS, turbidity, and metals concentrations with the average concentrations measured in the furthest downstream samples 200 feet below the dredge. The differences between the three sites illustrate the variability inherent in a dredge plume mixing under different conditions of river flow and turbulence.

Table 9. Percent Increases in TSS, Turbidity, and Metals Concentrations Measured 200 Feet Below Three Gold Dredges in the Similkameen River

Site No.	TSS (mg/L)	Turbidity (NTU)	Tot. Rec Arsenic (ug/L)	Dissolved Copper (ug/L)	Dissolved Zinc (ug/L)	Dissolved Lead (ug/L)
#1	100	21	35	0	20	ND
#10	200	75	2	7	62	ND
#12	14	33	9	0	86	9
mean =	100	43	15	2	56	9

ND = not detected

At 200 feet, complete mixing with the river had not occurred. On average, TSS concentrations 200 feet downstream of the dredges were twice as high (100% increase) as upstream of the dredges. Turbidity and dissolved zinc levels at 200 feet were half again as high as upstream (43 – 56% average increase). There was only a modest increase in arsenic, copper, and lead (2 – 15%).

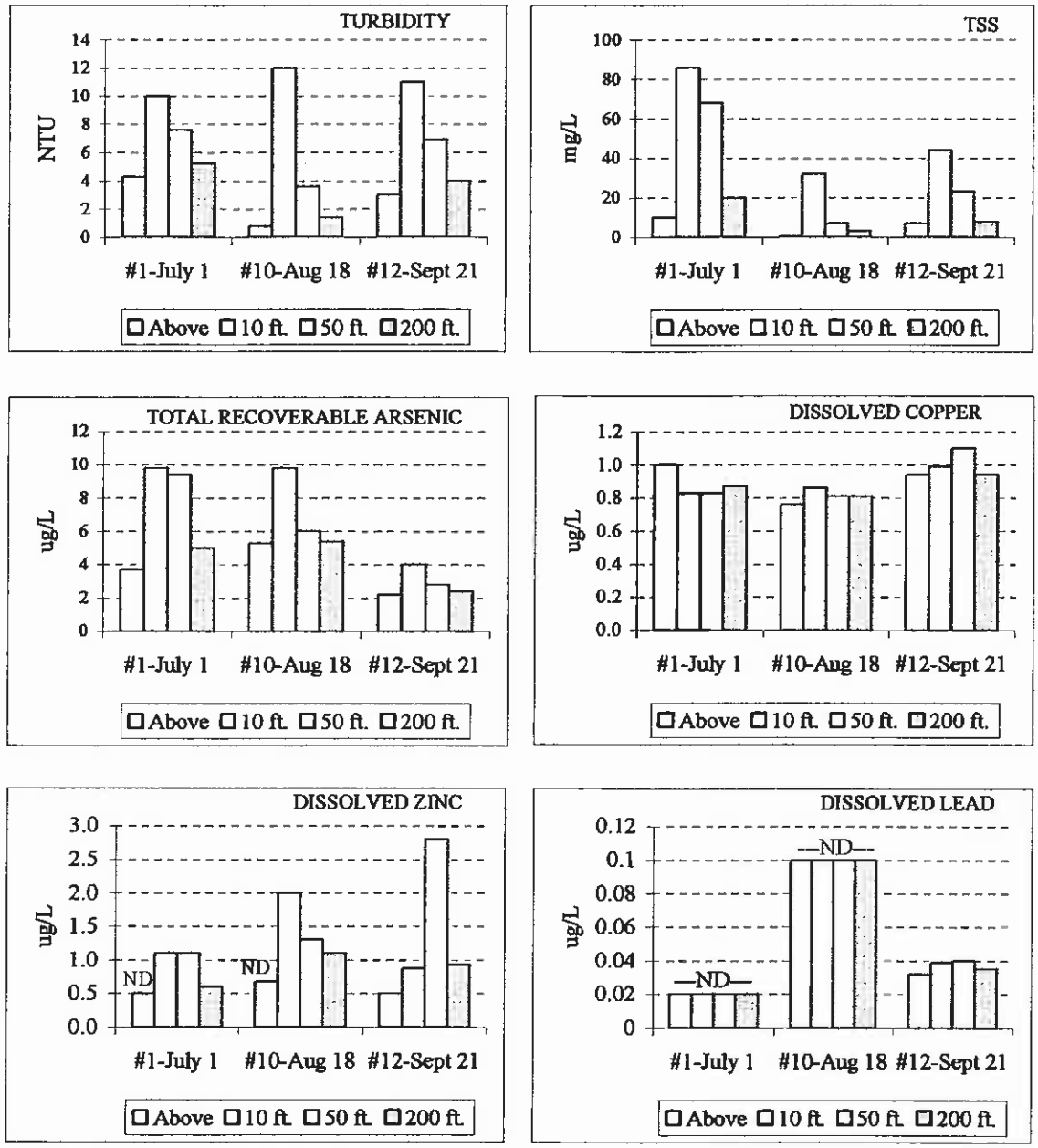

Figure 8. TSS, Turbidity, and Metals Concentrations Below Three Gold Dredges in the Similkameen River (mean of three grabs; ND = not detected).

Comparison with Water Quality Criteria

Table 10 compares the metals concentrations measured in Similkameen gold dredge effluents and dredge plumes with Washington state criteria for the protection of aquatic life. Copper, lead, and zinc toxicity varies inversely with hardness. The criteria were calculated for a hardness of 52 mg/L, the lowest recorded in the study.

Table 10. Metals Concentrations in Similkameen River Dredge Effluent and Plume Samples Compared to Criteria for Protection of Aquatic Life (ug/L)

	Arsenic	Copper	Lead	Zinc
Concentration Range in Effluents* (n=18)	2.6 - 8.0	2.0 - 9.3	0.16 - 1.3	1.8 - 9.4
Concentration Range Measured in Plume† (n=27)	2.3 - 17	0.79 - 1.2	<0.02 - 0.043	<0.5 - 4.1
Acute water quality criterion**	360	9.2	31	66
Chronic water quality criterion**	190	6.5	1.2	60

*total recoverable metals
†dissolved metals except total recoverable arsenic
**dissolved metals at 52 mg/L hardness (lowest recorded in study)

Based on analyzing 14 effluents and 27 plume samples, it appears that small-scale gold dredges have little or no potential to cause exceedances of aquatic life criteria in the Similkameen River. Arsenic and zinc concentration in dredge related samples were one to two orders of magnitude lower than criteria. Copper and lead concentrations were at or below criteria, except for one or two effluent samples that slightly exceeded (sites #4, #5, and #7).

The criteria comparison in Table 10 is a worst-case assessment in several respects:

1. Metals concentrations in the effluents and plumes would be subjected to further dilution in the river.
2. Subsamples for the effluent composites were only taken when the suction hose was in contact with the streambed. A true time-weighted composite would have included subsamples when the intake was lifted off the bottom – as periodically occurs – and only river water was being pumped through the dredge, resulting in lower average concentrations in the discharge.
3. Less restrictive water quality criteria would apply at other times of the dredging season when hardness levels are higher. For example, the acute criteria for copper increase from 6.5 to 9.6 ug/L going from a hardness of 52 mg/L (June 2004) to 82 mg/L (August 2004).
4. Once the effluents are discharged, the metals will partition into dissolved and particulate fractions. The dissolved fraction is the primary toxicity concern.

As previously described, ambient arsenic concentrations in the Similkameen River substantially exceed the Washington State human health criteria of 0.018 and 0.14 ug/L, due to natural conditions which have been exacerbated by historic land-based mining activity. The relative impact of dredge effluents on the already elevated arsenic concentrations in the river is assessed below.

Effect of Multiple Dredges

The metals concentrations measured in gold dredge effluents during the present study were at or below aquatic life criteria. Therefore, criteria exceedances would not be anticipated in the Similkameen River, regardless of the number of dredges operating. A series of dilution calculations were done to estimate what effect multiple dredges would have on metals concentrations in the river. As a point of reference, the maximum number of dredges Ecology personnel have observed on the Similkameen is approximately 20.

The calculations were done for both the average September flow and the 7-day, 10-year low flow, 616 cfs and 182 cfs, respectively (USGS Nighthawk gage). The August ambient data (Table 5) were used for the upstream metals concentrations. At that time the river was at 581 cfs. The detection limit was used for zinc and lead.

Average metal concentrations were used for the dredge effluents (Table 6), adjusted for the fraction that would be expected to be in the dissolved phase (based on the dissolved/total recoverable ratios in Table 5). Effluent flow rates ranged from 0.4 - 1.2 cfs, averaging 0.7 cfs (Appendix C); 1.0 cfs was used in the calculations. It was assumed the dredges operated continuously.

The results of the dilution calculations are in Table 11. During average September flows, it is estimated that somewhere between 17 and 57 dredges operating continuously would be required to increase dissolved zinc, lead, and copper concentrations in the Similkameen River by 10%. It would take between approximately 200 and 520 dredges to have the same effect on total recoverable and dissolved arsenic, respectively. In order for zinc, lead, or copper concentrations to be doubled in the river, anywhere from 170 to 570 dredges would need to be operating. Arsenic concentrations in the dredge effluents are too low to cause an increase of that magnitude, regardless of river flow.

At the 7-day, 10-year low flow in the Similkameen, relatively few dredges could effect a 10% change in copper, lead, and zinc concentrations. It would take 50 or more continuously operating dredges to double concentrations of these metals.

As demonstrated elsewhere in this report, a 100% increase in the ambient arsenic, copper, lead, or zinc concentrations in the Similkameen River would not result in exceedances of aquatic life criteria.

Table 11. Estimated Number of Dredges Required to Increase Metals Concentrations in the Similkameen River by 1%, 10%, and 100% [see text for assumptions and data used]

	@ Average September Flow - 616 cfs		
	1%	10%	100%
Tot. Rec. Arsenic	20	200	**
Dissolved Arsenic	52	520	**
Dissolved Copper	6	57	570
Dissolved Lead	3	31	310
Dissolved Zinc	2	17	170

	@ 7-Day, 10-Year Low Flow - 182 cfs		
	1%	10%	100%
Tot. Rec. Arsenic	6	59	**
Dissolved Arsenic	15	150	**
Dissolved Copper	2	17	170
Dissolved Lead	1	9	92
Dissolved Zinc	1	5	51

**effluent concentration too low to result in 100% increase

Results of this study show that the concentrations of arsenic, copper, lead, and zinc discharged from small-scale gold dredges operating in the Similkameen River are not a significant toxicity concern for aquatic life. Although this activity will exacerbate the exceedances of the arsenic human health criteria that already occur, it would take very large numbers of dredges to effect a 10% change in the river's arsenic levels, even at low-flow conditions.

These conclusions may not apply to the sediment deposits behind Enloe Dam. This material could have different physical/chemical properties that the sediments evaluated in the present study.

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Appendices

A. Results from Analyzing Metals and Organic Compounds in Similkameen River Sediment Samples

B. Metals Data for Ecology Routine Monitoring Station 49B070, Similkameen River at Oroville

C. Site Locations and Other Information on the Similkameen River Gold Dredge Samples

D. Results on Laboratory Duplicates for the Similkameen River Gold Dredge Study

E. Results on Field Blanks for the Similkameen River Gold Dredge Study

Appendix A-1. Results of Metals and Cyanide Analyses on Similkameen River Sediment Samples (mg/Kg, dry weight)

Site No.	Date	Sample No.	Depth Interval	Iron	Aluminum	Manganese	Zinc	Copper	Arsenic	Chromium	Nickel	Lead	Cadmium
						UPPER RIVER							
1	29-Aug-95	358246	0-2 cm	**12900**	**7030**	**236**	**35**	**22**	**12**	**12**	**12**	**2.4**	0.3 U
2	23-Aug-98	398060	0-10 cm	**14000**	**6980**	NA	**32**	**25**	**11**	**13**	**11**	**3.3**	0.5 U
						PALMER LAKE - NIGHTHAWK							
3	24-Aug-98	398061	0-10 cm	**15700**	**7790**	NA	**35**	**28**	**17**	**15**	**15**	**3.9**	0.5 U
4	30-Aug-95	358244	0-2 cm	**19500**	**10700**	**389**	**56**	**60**	**30**	**21**	**19**	**5.4**	0.3 U
4	24-Aug-98	398062	0-10 cm	**19900**	**10100**	NA	**48**	**51**	**43**	**22**	**19**	**5.4**	0.5 U
5	30-Aug-95	358243	0-2 cm	**17000**	**8490**	**300**	**46**	**43**	**46**	**18**	**17**	**4.5**	0.3 U
5	24-Aug-98	398063	0-10 cm	**13400**	**7040**	NA	**29**	**17**	**9.5**	**11**	**9.1**	**2.4**	0.5 U
						EAGLE ROCK							
6	24-Aug-98	398064	0-10 cm	**14700**	**7230**	NA	**33**	**24**	**19**	**13**	**12**	**3.0**	0.5 U
						ENLOE DAM							
7	23-Aug-98	398065	0-10 cm	**14200**	**7080**	NA	**31**	**18**	**12**	**13**	**12**	**2.4**	0.5 UJ
7	30-Sep-99	408020	0-1 ft	NA	NA	NA	**36**	**21**	**15**	**15**	**11**	**3.2**	**1.1**
7	30-Sep-99	408021	1-2 ft	NA	NA	NA	**31**	**13**	**7**	**11**	**7.8**	**2.0**	**0.86**
8	30-Sep-99	408022	0-1 ft	NA	NA	NA	**32**	**13**	**7.8**	**12**	**8.6**	**2.2**	**0.81**
8	30-Sep-99	408023	1-2 ft	NA	NA	NA	**30**	**12**	**7.2**	**11**	**7.9**	**2.0**	**0.79**
9	30-Aug-95	358242	0-2 cm	**16200**	**8940**	**305**	**50**	**45**	**21**	**18**	**16**	**4.1**	0.3 U
9	23-Aug-98	398066	0-10 cm	**14600**	**7275**	NA	**32**	**21**	**14**	**14**	**12**	**2.8**	0.5 U
9	30-Sep-99	408024	0-1 ft	NA	NA	NA	**33**	**17**	**10**	**13**	**9.2**	**2.3**	**0.94**

Note: Detections highlighted in **BOLD**
NA = not analyzed
U = not detected at or above reported value
J = estimated value
UJ = not detected at or above reported estimated value

Appendix A-1. (continued)

Site No.	Date	Sample No.	Depth Interval	Silver	Beryllium	Thallium	Mercury	Antimony	Selenium	Cyanide
				UPPER RIVER						
1	29-Aug-95	358246	0-2 cm	0.3 U	NA	NA	0.01 U	NA	0.4 U	NA
2	23-Aug-98	398060	0-10 cm	**0.66**	**0.24**	**0.38** J	**0.012**	4 UJ	0.3 U	0.10 U
				PALMER LAKE - NIGHTHAWK						
3	24-Aug-98	398061	0-10 cm	**0.78**	**0.28**	**0.50** J	**0.018** J	4 UJ	0.3 U	0.10 U
4	30-Aug-95	358244	0-2 cm	**0.30** J	NA	NA	**0.012**	NA	0.4 U	NA
4	24-Aug-98	398062	0-10 cm	**0.83**	**0.38**	0.3 U	**0.029**	4 UJ	0.3 U	0.10 U
5	30-Aug-95	358243	0-2 cm	**0.30** J	NA	NA	0.01 U	NA	0.4 U	NA
5	24-Aug-98	398063	0-10 cm	**0.59**	**0.24**	0.3 U	**0.031**	4 UJ	0.3 U	0.10 U
				EAGLE ROCK						
6	24-Aug-98	398064	0-10 cm	**0.74**	**0.23**	0.3 U	**0.0085**	4 UJ	0.3 U	0.10 U
				ENLOE DAM RESERVOIR						
7	23-Aug-98	398065	0-10 cm	**0.58**	**0.21**	0.3 U	**0.0072**	4 UJ	0.3 U	0.10 U
7	30-Sep-99	408020	0-1 ft	2 U	**1.3**	0.3 U	**0.013**	5 UJ	0.3 U	NA
7	30-Sep-99	408021	1-2 ft	2 U	**0.97**	0.3 U	0.01 U	5 UJ	0.3 U	NA
8	30-Sep-99	408022	0-1 ft	2 U	**1.2**	0.3 U	0.01 U	5 UJ	0.3 U	NA
8	30-Sep-99	408023	1-2 ft	2 U	**1.0**	0.3 U	0.01 U	5 UJ	0.3 U	NA
9	30-Aug-95	358242	0-2 cm	0.3 U	NA	NA	**0.012**	NA	0.4 U	NA
9	23-Aug-98	398066	0-10 cm	**0.73**	**0.23**	0.3 U	**0.014** J	4 UJ	0.3 U	0.10 U
9	30-Sep-99	408024	0-1 ft	2 U	**1.1**	0.3 U	0.01 U	5 UJ	0.3 U	NA

Note: Detections highlighted in **BOLD**
NA = not analyzed
U = not detected at or above reported value
J = estimated value
UJ = not detected at or above reported estimated value

Appendix A-2. Results from Analyzing Semivolatiles, PCBs, and Pesticides in Core Samples Collected behind Enloe Dam in September 1999 (ug/Kg, dry weight; only detected compounds shown)

Site No:	7		8		9
Location:	Upper Reservoir		Middle Reservoir		Lower Res.
Depth Interval (cm):	0-30	30-60	0-30	30-60	0-30
Sample No:	408020	408021	408022	408023	408024
Semivolatiles					
Polyaromatic Hydrocarbons					
Naphthalene	**13**	6.7 U	**7.8 J**	12 U	**7.9 J**
1-Methylnaphthalene	**14**	6.7 U	**5.8 J**	**5.6 J**	**7.6 J**
2-Methylnaphthalene	**17**	6.7 U	**9.2 J**	**8.2 J**	**10 J**
Fluorene	**8.9 J**	6.7 U	12 U	12 U	12 U
Phenanthrene	**55**	**4.2 J**	**8.9 J**	**8.0 J**	**12 J**
Anthracene	**23**	6.7 U	12 U	12 U	12 U
Fluoranthene	13 U	**4.2 J**	**8.7 J**	12 U	**9.7 J**
Pyrene	**8.4 J**	6.7 U	**6.6 J**	**6.3 J**	**7.7 J**
Benzo(a)anthracene	13 U	**5.2 J**	12 U	**9.4 NJ**	12 U
Chrysene	13 U	6.7 U	12 U	12 U	**9.6 J**
Total PAH	**139**	**14**	**47**	**38**	**64**
Miscellaneous Compounds					
2-Methylphenol	**8.5**	6.7 U	12 U	12 U	**5.9 J**
4-Chloro-3-Methylphenol	13 U	6.7 U	12 U	12 U	**17**
2-Nitroaniline	13 U	6.7 U	12 U	12 U	**36**
3-Nitroaniline	**49**	6.7 U	12 U	12 U	12 U
Dibenzofuran	**12 J**	6.7 U	**6.4 J**	**6.3 J**	**7.0 J**
Retene	**522**	**7.9**	**83**	**48**	**203**
Carbazole	**1.2 J**	6.7 U	12 U	12 U	12 U
Di-N-butylphthalate	**3490 E**	54 U	386 U	711 U	243 U
Butylbenzylphthalate	26 U	**10**	19 U	23 U	22 U
PCBs	ND	ND	ND	ND	ND
Chlorinated Pesticides	ND	ND	ND	ND	ND
Organophosphorus Pesticides	ND	ND	ND	ND	ND
Nitrogen Pesticides	ND	ND	ND	ND	ND

Note: Detections highlighted in **BOLD** NJ = evidence analyte is present; value is an estimate
U = not detected at or above reported value E = estimated value that exceeds the calibration
J = estimated value ND = not detected

Appendix B. Metals Data for Ecology Routine Monitoring Station 49B070, Similkameen River @ Oroville (ug/L)

Date	Arsenic		Cadmium		Chromium		Copper	
	Diss.	Tot. Rec.	Diss.	Tot. Rec.	Diss.	Tot. Rec.	Diss.	Tot. Rec.
09-Oct-95			0.04 U	0.1 U		1 U	0.609	0.7
11-Dec-95		21.6	0.04 U	0.1 U		4	2.51	10.1
12-Feb-96		1.94	0.02 U	0.1 U		5 U	0.972	1.5 B
15-Apr-96		3.6	0.077 J	0.1 U		1.5	5.21 J	5.2
11-Jun-96		6.27	0.022	0.1 U		1.4	1.39	6.3
13-Aug-96		3.78	0.04	0.1 U		0.4 U	0.846	1.3
15-Oct-96		2.77	0.019	0.1 U		0.4 U	0.759	1.1 J
10-Dec-96		1.9	0.019	0.1 U		0.4 U	0.48	0.7
15-Apr-97		2.04	0.02 U	0.1 U		0.27	1.21	2.3
10-Jun-97		8.28	0.02 U	0.1 U		1.4	1.44	8.7
12-Aug-97		4.18	0.02 U	0.1 U		0.2 U	0.881	1.1
15-Dec-98			0.02 U				0.554	
11-May-99			0.02 U				1.22	
02-May-00		3.4						
06-Jun-00		4.6						
11-Jul-00		2.1						
15-Aug-00	5.4	4.4						
05-Sep-00		3.3						
04-Oct-00		2.6						
08-Nov-00								
06-Dec-00								
17-Jan-01								
07-Feb-01								
07-Mar-01								
04-Apr-01	2.36	2.25						
09-May-01	1.6	2.35						
06-Jun-01								
08-Oct-02	3.09	3.07	0.1 U	0.1 U	0.42	0.5 U	0.81	0.99
03-Dec-02	2.06	1.93	0.02 U	0.1 U	0.75	0.5 U	0.51	0.75
04-Feb-03	1.73	1.61	0.02 U	0.1 U	0.3	0.5 U	0.74	1.01
08-Apr-03	1.64	1.7	0.1 U	0.1 U	0.5 U	0.5 U	0.5 U	1.39 J
03-Jun-03	1.5	4.33	0.02 U	0.1 U	0.25 U	1.3	1.18	4.57
05-Aug-03	6.37	5.61	0.02 U	0.1 U	0.4	0.5 U	0.77	0.98

B = The analyte was detected in the method blank.
U = The analyte was not detected at or above the reported result.
J = The analyte was positively identified. The associated numerical result is an estimate.

Appendix B. (continued)

Date	Lead		Mercury	Nickel		Zinc		Hardness
	Diss.	Tot. Rec.	Total	Diss.	Tot. Rec.	Diss	Tot. Rec.	
09-Oct-95	0.03 U	0.1 U	0.001 U	1 U		1.1	5.9 B	86
11-Dec-95	0.362	1.5	0.001	1 U		5 U	14.1 B	82
12-Feb-96	0.025	0.1	0.001 U	0.586		1.2 B	5 U	76
15-Apr-96	0.72 J	0.8	0.002	1.62 J		4.2 B	4.8	63
11-Jun-96	0.032	0.8	0.004	0.508		1.1	10.8 B	43
13-Aug-96	0.02 U	1	0.001 U	0.615		1	3.4 B	78
15-Oct-96	0.087	0.1 U	0.002 U	0.6		1.4 J	3.5 J	98
10-Dec-96	0.03 U	0.2	0.001 U	0.5		0.76	4 J	95
15-Apr-97	0.02 U	0.2	0.002 U	0.73		0.49	14.6	95
10-Jun-97	0.03	0.9	0.002 U	0.562		3.37	13 J	45
12-Aug-97	0.039	0.2	0.002 U	0.602		1.81	2.2	87
15-Dec-98	0.02 U		0.002 U	0.898		0.77		112
11-May-99	0.027		0.003	0.665		1.4 J		66
02-May-00								
06-Jun-00								
11-Jul-00								
15-Aug-00								95.4
05-Sep-00								88.6
04-Oct-00								90.1
08-Nov-00								86.8
06-Dec-00								104
17-Jan-01								103
07-Feb-01								103
07-Mar-01								73.2
04-Apr-01								103
09-May-01								
06-Jun-01								46.7
08-Oct-02	0.02 U	0.14	0.002 U	0.49	0.81	1 U	5 U	94.6
03-Dec-02	0.036	0.1 U	0.0033	0.73	0.71	1 U	5 U	97.8
04-Feb-03	0.02 U	0.1 U	0.002 U	0.39	0.46	1 U	5 U	81.4
08-Apr-03	0.02 U	0.11	0.004 U	0.62	0.91	1.1	5 U	79.4
03-Jun-03	0.041	0.44	0.0066	0.39	1.33	1.3	5.7	38.3
05-Aug-03	0.02 U	0.1 U	0.002 U	0.54	0.66	1 U	5 U	94.7
								38.3

B = The analyte was detected in the method blank.
U = The analyte was not detected at or above the reported result.
J = The analyte was positively identified. The associated numerical result is an estimate.

Appendix C. Site Locations and Other Information on Similkameen River Gold Dredge Samples

Site No. Date Owner	Site Description	River Mile Latitude Longitude*	Dredge Description and Operation	Effluent Flow Stream Depth/Velocity† Substrate	Ecology Personnel
#1 1-Jul-04 Creegan	Approx. 500 ft. below BNRR bridge, left bank	6.5 48 56 54 119 27 40	"Precision" dredge, 5" intake reduced to 4", 250 gpm pump, 6-8 feet off bank	1.2 cfs 2.5 ft. / 2.3 fps cobble w/ gravel & sand	Peterschmidt Johnson
#2 1-Jul-04 Lease	Approx. 100 yards below Eagle Rock, left bank	10.8 48 58 58 119 32 05	Custom, 6" intake reduced to 4", 1,200-1,500 gpm pump, 6 feet off bank	1.2 cfs 3 ft. / 0.9 fps cobble w/ sand	Peterschmidt Johnson
#3 18-Aug-04 Ching	S-turn @ irrigation canal crossing, left bank	13.7 48 59 15 119 32 25	Stilt mounted, 2.5"intake, 6.5 hp, working in streamside hole	no data 1.5 ft. / 1.4 fps cobble and boulders	Coffin Latham
#4 18-Aug-04 Sweeney	Approx. 1/2 mile upstream of S-turn, left bank	14.1 48 59 20 119 34 36	Floating dredge, 3" intake, 5 hp pump, 3 feet off bank	no data 1 ft. / 0.9 fps boulders	Coffin Latham
#5 18-Aug-04 Hard	Approx. 1 mile above Eagle Rock, left bank	11.1 48 58 51 119 32 24	Floating dredge, 4" intake, 5 hp pump	no data 3 ft. / 2.2 fps bedrock w/ fines	Coffin Latham
#6 19-Aug-04 Franklin	Above Eagle Rock, left bank	10.9 48 58 53 119 32 17	"Keene" dredge, 4" intake, 5 hp pump	no data 1.3 ft. / 2.5 fps cobble and bedrock	Coffin Latham
#7 18-Aug-04 Estes	Approx. 2 miles below Nighthawk left bank	15.8 48 29 12 119 33 58	"Keene" triple sluice, 4" intake, 300-450 gpm, 20 feet off bank	no data 1.4 ft. / 0.35 fps large cobble w/ fines	Coffin Latham
#8 18-Aug-04 Wade	River Oaks RV Resort, left bank	5.2 48 56 13 119 26 35	"Dahlke Polydredge", 4" intake, 300 gpm, 5 hp pump, 20 feet off bank	1.0 cfs 1.5 ft / 0.5 fps cobble	Johnson Wittmeier

Appendix C. (continued)

Site No. Date Owner	Site Description	River Mile Latitude Longitude*	Dredge Description and Operation	Effluent Flow Stream Depth/Velocity† Substrate	Ecology Personnel
#9 19-Aug-04 - -	Approx. 1.5 miles above Eagle Rock, left bank	13 48 59 08 119 33 39	3" intake, 5.5 hp pump, 20 feet off bank	0.2 cfs 1.3 ft. / 0.7 fps cobble and gravel	Peterschmidt Johnson
#10 18-Aug-04 Wade	River Oaks RV Resort, left bank	5.2 48 56 13 119 26 35	"Dahlke Polydredge", 4" intake, 300 gpm, 5 hp pump, 20 feet off bank	1.0 cfs 1.5 ft / 0.5 fps cobble	Johnson Wittmeier
#11 19-Aug-04 - -	Approx. 1/2 mile above S-turn, left bank	14.3 48 59 20 119 34 50	Custom dredge, 4" intake, 5.5 hp pump, 30 feet off bank	0.4 cfs 2 ft. / 0.3 fps cobble	Peterschmidt Johnson
#12 21-Sep-04 Chase	"Boat ramp", left bank	13.3 48 58 50 119 32 32	Floating dredge, 4" intake, 7 hp pump, 10 feet off bank	0.5 cfs 1.5 ft. / 0.85 fps cobble and gravel	Peterschmidt Johnson
#13 21-Sep-04 Miltner	Approx. 1 mile above Eagle Rock, left bank	12.8 48 58 54 119 33 24	Floating dredge, 4" intake, 5.5 hp pump, 10 feet off bank	0.4 cfs 0.9 ft. / 1.3 fps cobble w/ gravel & silt	Peterschmidt Johnson
#14 22-Sep-04 - -	Approx. 1 mile below Enloe Dam, left bank	8.5 48 57 41 119 29 46	Floating dredge, 2.4 inch intake, 6.5 hp pump, 15 feet off bank	- - - - boulders	Peterschmidt

*NAD 27

†immediately upstream of dredge intake hose

Appendix D. Results on Laboratory Duplicates for the Similkameen River Gold Dredge Study (laboratory splits)

Sample Type	Ambient River Water						Dredge Effluent					
Sample No.	274080	274080-dup.	RPD	344230	344230-dup.	RPD	274087	274087-dup.	RPD	344242	344242-dup.	RPD
Tot. Rec. Zinc (ug/L)	1.6	2.3	36	<1.0	<1.0	0	2.1	2.0	5	3.5	4.0	13
Tot. Rec. Copper (ug/L)	2.4	2.5	4	1.2	1.2	0	2.3	2.3	0	3.2	3.1	3
Tot. Rec. Lead (ug/L)	0.12	0.15	22	<0.10	<0.10	0	0.21	0.21	0	0.40	0.42	5
Tot. Rec. Arsenic (ug/L)	3.7	4.0	8	4.2	4.2	0	3.2	3.2	0	7.1	7.1	0
Dissolved Zinc (ug/L)	1.0	1.1	10	1.2	1.1	9	N/A	N/A	- -	N/A	N/A	- -
Dissolved Copper (ug/L)	0.82	0.83	1	0.87	0.83	5	N/A	N/A	- -	N/A	N/A	- -
Dissolved Lead (ug/L)	<0.02	<0.02	0	<0.10	<0.10	0	N/A	N/A	- -	N/A	N/A	- -
Dissolved Arsenic (ug/L)	2.8	2.8	0	4.2	4.2	0	N/A	N/A	- -	N/A	N/A	- -
TSS (mg/L)	10	10	0	2	3	40	N/A	N/A	- -	N/A	N/A	- -
Turbidity (NTU)	3.7	4.2	13	2.2	2.2	0	N/A	N/A	- -	N/A	N/A	- -
Hardness (mg/L)	52	52	0				N/A	N/A	- -	N/A	N/A	- -

RPD = relative percent difference (range of duplicates as percent of duplicate mean)
N/A = not analyzed

Appendix E. Results on Field Blanks for the Similkameen River Gold Dredge Study (ug/L)

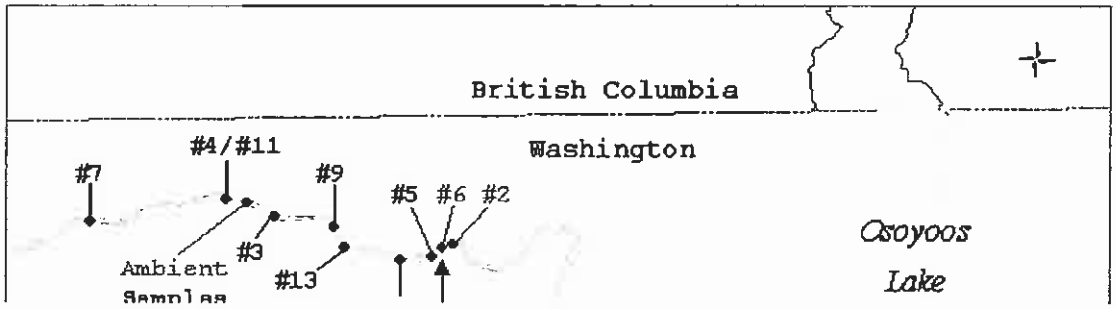
Sample Type	Date	Zinc	Copper	Lead	Arsenic
Bottle Blank	30-Jun-04	<1.0	<0.10	<0.10	<0.10
Filter Blank	"	0.56	<0.10	<0.02	<0.10
Bottle Blank	18-Aug-04	<1.0	<0.10	<0.10	<0.10
Filter Blank	"	1.1	<0.10	<0.10	<0.10
Bottle Blank	21-Sep-04	<1.0	<0.10	<0.10	<0.10
Filter Blank	"	<0.50	<0.10	<0.02	<0.10

Samples for the gold dredge study were collected on June 30 - July 1, August 18 - 19, and September 21 - 22, 2004. Monthly average river flow during this period typically ranges from 3,029 cfs (July) to 616 cfs (September).

The first set of samples corresponded to the July 1 opening of the mineral prospecting work window. The second sample set was collected during a Resources Coalition dredge rally held in Oroville on August 18 - 22, an event designed to generate interest and improve understanding of small-scale gold dredging. The third sample set was intended to assess dredging impacts during September low flow.

Ambient Samples

Background concentrations for the metals and other parameters of interest were determined by analyzing water samples collected in the Similkameen River approximately 3 ½ miles below Nighthawk (Figure 5). This location is in the upper part of the reach where most dredgers work. The ambient samples were collected on June 30, the day before the opening of the dredging season, and again in the early morning of August 19 and September 22 before dredgers began working the river.



STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
704 Lewis Building
Portland, Oregon

Placer Mining on the Rogue River, Oregon, in Its Relation to the Fish and Fishing in that Stream

By

Dr. HENRY BALDWIN WARD, Consultant

An Ecological Study Made for the
Oregon State Department of Geology and Mineral Industries
September, 1937 – May, 1938

STATE GOVERNING BOARD

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GENERAL CONSIDERATIONS

INTRODUCTION

In August, 1937, I was consulted by Mr. Earl K. Nixon, director of the Oregon Department of Geology and Mineral Industries. He stated that the governing board of that department desired to arrange for a study of the effects of placer mine washings on the runs of valuable fish in the Rogue River. Mr. Nixon assured me that the Board had no desire to confirm fixed views but sought to ascertain the actual facts in the case and would welcome the most careful and complete study of the river whatever might be the results of such a study.

Shortly after this conference I received an invitation from the Board to undertake the work in accordance with the general understanding reached in my interview with Mr. Nixon. The month of September was spent partly in Portland conferring with various persons officially interested in the work on the Rogue River, and in part on the river. This was the low water period of the year. Further studies were made on the river at high water stage in March and early April, 1938; following that, the results of my work were discussed in Portland with the director and others.

A preliminary report was submitted last October. At that time as a basis for final conclusions I recommended the periodic collection of water samples at different places on the Rogue and the determination of turbidity and of erosion load throughout the year at points above the entrance of placer mine run-off and also below that. It was agreed that such tests be carried out at Grants Pass and at Agness.

During September I had been granted the assistance in the field of Mr. A. M. Swartley of the department. His intimate knowledge of the area and broad professional experience in geology proved of great service in the study of the river conditions and their probable origin. At the conclusion of our work together, Mr. Swartley wrote an extended report on the physiographic features of the region. From this valuable record I present herewith a part of Mr. Swartley's manuscript having a particularly intimate relation to the biological studies and conclusions reached in my own report. Mr. Swartley's section appears as Appendix A.

I also recommended that experiments be made to measure the effects on young salmon and trout kept for some time in water heavily loaded with mud from placer mining projects. Accordingly Mr. Nixon arranged with Dr. L. E. Griffin to carry out such experiments in his laboratory at Reed College. A summary of Dr. Griffin's important experiments is given with his permission in Appendix B. It is important here to emphasize one conclusion of Dr. Griffin: namely, that these few preliminary experiments should be carried further. The general results secured cannot be questioned, but their unique character and their importance both practically and scientifically call for their repetition in the light of experience gained in order to determine the limits, if any, within which the conclusions are to be accepted. I am indebted to Mr. Swartley and to Dr. Griffin for the privilege of including sections of their reports in my own.

Before I started on a study of the river the complaint filed with the court by citizens of Curry county was placed in my hands. Careful and repeated study of this document familiarized me with the views of the complainants regarding the condition of the river, the state of the fisheries and the alleged cause of the conditions which were described in detail in the document. This presentation of the case was kept constantly in mind; the region was studied with care and no trouble was spared in my efforts to determine the accuracy of the report and the justification for the opinions advanced. The various items included in that complaint are discussed later in my report in connection with the analysis of the situation as I found it.

My problem was to determine how far and in what way the fish of the Rogue River and its tributaries were affected by the placer mine run-off. No other region was to be considered; no other type of mining was to be taken into account. I was free to ascertain the facts in the situation and to make known all the facts which might be discovered in my study without suppressing or modifying any of them to meet the views of any of the apparently conflicting interests involved. I have tried to justify the responsibility laid upon me and hope that I have succeeded in some measure in discharging that responsibility.

THE ROGUE RIVER

The Rogue River rises in the Cascades of southern Oregon; its headwaters drain the entire western slopes of the ridges which encircle Crater Lake. For about 250 miles among mountains and hills it pursues a circuitous course trending southwest before it empties into the Pacific Ocean at Gold Beach. The region has long been known for the beauty of its scenery, the fertility of its orchard-filled valleys, the abundance and quality of its fish. First of all in the record of history was the fame of its gold-bearing sands and gravels which were extensively exploited by early settlers and have continued with varying activity to yield of their riches to those engaged in placer mining. No records have been found giving accurate data concerning the condition of the water in those early days. We may be sure that workings so extensive as were operated then discharged into the river considerable volumes of the same material that characterizes the run-off today. Indeed, it is reported by early navigators along this coast that the outlet of the river could be detected by the volume of reddish yellow water which it poured out and which could be followed for a considerable distance into the sea before it mingled indistinguishably with the ocean waters.

Only one published record has been found of previous analyses made of water from the Rogue River. This was printed in Water Supply Paper 363 (U. S. Geol. Survey, 1914). The table given there covers a period from September 10, 1911, to August 14, 1912, and the samples were taken near Tolo (now Goldray). It represents conditions in the stream far above placer mining operations, hence due entirely to natural erosion. The suspended matter varied from 3.6 to 1,360 tons per day and the dissolved matter from 239 to 2,328 tons per day. The turbidity varied from a trace to 350 scale units and the curve of variation in turbidity departed somewhat widely from that of the amount of suspended matter present. Thus the maximum turbidity recorded was observed in the period July 16–25, whereas the maximum of suspended and dissolved materials was obtained on January 8–17. The volume of the river fluctuated also widely, as shown by variations in the mean discharge from 1,141 to 14,134 second feet. Though this record covers a single year only, it shows wide and also rapidly fluctuating conditions to which the fish in it have been and still are subjected by nature.

The geography, geology, climate, water supply and floods in the Rogue River valley are succinctly discussed in the introduction to Water Supply Paper 638-B (U. S. Geol. Survey, 1932) on the Water Power Resources of the Rogue River Drainage Basin, Oregon. No further discussion of these features is needed here. The data given in this bulletin are of value in determining the significance of the additions to the normal stream flow as the results of placer mining operations.

ROGUE RIVER FISH AND FISHING

The Rogue River has long been held in high esteem as a salmon stream. It has been visited annually by many fishermen from Oregon and from other states and records of their sport, printed in various magazines devoted to travel and outdoor life, have given it truly an international reputation. Some years ago I met on the Rogue the treasurer of the International Olympic Games Committee who had come from England to test his skill on the far-famed salmon and steelhead of that stream. In 1930 I myself published in *Outdoor America* an article in which I dwelt on the beauty of the stream, the abundance and fine quality of its fish and its high value as a recreational center for Oregon and its visitors. Many other similar articles might be cited.

Only three species of anadromous fish contribute in significant numbers to the fame of the river: the chinook salmon (*Oncorhynchus tschawytscha*), also known as king, Columbia River, or quinnat salmon; the silversides (*Oncorhynchus kisutch*), also called coho, or silver salmon; and the steelhead (*Salmo gairdnerii*), commonly classed as salmon trout and regarded by ichthyologists as the sea-run form of the rainbow trout (*Salmo irideus*). Of interest to the fisherman are the various trout of the Rogue system. These do not run to the sea and are not further considered in this report.

It has been customary to speak of separate runs of spring and fall chinooks and of summer and winter steelheads. These are not always clearly separable and their spawning periods are either identical or closely continuous. Structurally the varieties cannot be separated and differences in movement and other activities vary with exact climatic conditions. They are not known to be

affected differently by factors discussed in this report.

No one knows when salmon or trout first came to the Rogue River, but it seems probable that the salmon spawned at the foot of the retreating glaciers of the Ice Age and followed up the cool run off of the disappearing ice masses until their spawning grounds became as today: "These species of anadromous fish ascend the river to the highest point attainable before making their spawning beds, seeking the waters that are purest and coldest." (Wharton—*The Rogue River*)

The first settlers found the stream teeming with the same fish that are present today in lesser numbers. Testimony of the former abundance of salmon is given by many brief references in early records which though apparently extreme in phraseology are nevertheless proof that the fish in their annual migrations appeared in enormous numbers. That these numbers have been greatly reduced in the last 75 years is unquestionably true. But the same is true in every region and probably in every stream from California to Alaska. Increase in population and consequent modifications in natural conditions, multiplication in number of fishermen and "improvements" in means of capturing the fish, better means of transportation and economic pressure are among the factors which have multiplied many times the hazards facing the fish. As one scans the long list of perils that confront the fish in fresh water and in the sea, from the start of life to its finish, should we not rather marvel that despite all so many survive to multiply and maintain the race?

The river was once the seat of an extensive commercial fishery. From the records of the Oregon State Fish Commission it appears that the commercial catch in the years 1929-1933 inclusive was 185,775; 194,269; 267,766; 528,384; and 346,962 chinook salmon alone. In 1934 the catch was 174,006, and the river was closed to commercial fishing June 13, 1935. During all this period the steelhead was rated as a game fish and was not legally taken except on hook and line. Large meshed nets employed in commercial fishing insured a nearly total escapement of the steelheads and also of all save the largest silver salmon, although in the years 1929–1933 from one to 42,000 silversides were taken annually, or on the average in that period nearly 15,000 a year. Since the time when the Rogue was closed to commercial fishing in 1935, all the fish captured have been taken legally only by sport fishermen limited in season and to the use of hook and line alone. But no record of the catch is required and no figures can be given to measure the present size of the run. Estimates are subject to individual prejudice and are of limited value. In considering the present supply one must bear in mind furthermore that the time intervening has not been long enough to demonstrate the results of this remedial measure. It is well known that the curve of destruction descends sharply, but the curve of recovery rises very slowly at the start.

MUDDY WATER

The Rogue has always carried loads of silt. The extent of its drainage, the depth of its valleys, the amount of water-worn material in its area, and the drop of several thousand feet in its course of 250 miles to the sea, as well as the consistent testimony of explorers and settlers during the last century, give evidence of marked fluctuations in volume of stream flow and in clearness and turbidity of its waters.

All the evidence that has been obtained justifies the conclusion that no present-day contributions of materials produced by bank erosion differ in character or exceed in amount those added periodically by purely natural processes in past times. Splendid runs of salmon and steelhead were established and maintained under truly natural conditions which certainly were on occasion more extreme and violent before man ever came into the picture than they are today. Furthermore, there is good reason to believe that placer mining run-off was larger in amount and more continuous in the early years of that industry when for a time at least greater areas were being mined, more men were at work and cruder, more violent methods were followed than are employed today.

Somewhat later the best deposits seemed to have been exhausted, new discoveries of gold elsewhere drew attention away from this region. More recently social and economic changes have led to new interest in this resource and to renewed activity in Rogue River valley placer mining. Even at that the industry has not apparently assumed the proportions of that first period. This is important in our discussion as indicating that conditions today do not exceed and probably do not equal those which the fish met naturally before our nationals invaded this valley and also during that earlier period of pioneer mining activity.

CHANGES IN THE RIVER AFFECTING FISH LIFE

The river is modified and the life and habits of the fish in its waters are affected by such changes as are produced by human agencies. To be sure no one can think rightly of the stream itself as a constant environment. On the contrary it is undergoing continual change. The amount and location of winter's snowfall, the volume and time of seasonal rains, the duration and precise period of regional droughts, and other climatic variations produce variations in water level, in bank erosion, in growth of grasses, underbrush and trees in the drainage basin; thus sudden and often extreme changes in contours of the banks and surrounding country add sediments of different types to its waters and modify the conditions under which the fish it harbors are forced to live.

Similar changes which are not so easily seen take place in the bed of the river. Each flood cuts deep holes at some places and fills up such holes elsewhere; materials picked up at one point are sorted as the current varies and deposited at many different points. No region is spared, for even solid rocks are deeply grooved or broken and moved about as time passes. During my study of the river in March a tremendous slide at one point poured tons of material into the stream and blocked its course for days. In the past history of the valley such occurrences have often recurred and interfere violently with the gradual though slow disintegration of rocks and soil which are constantly adding to the environmental materials on which weather and water may work in tearing down and upbuilding the different areas in the valley.

Coming from the spring-fed slopes of high mountains, its waters were cold and pure. Its rapid descent and its rocky banks with frequent rapids in its course loaded the water with a rich supply of oxygen. The heavy forest cover of its shores in primitive days served to maintain the low temperature and high oxygen supply of its waters.

Thus the Rogue River furnished originally unsurpassed conditions for the development and perpetuation of large and fine races of the anadromous fishes. The coming of man has wrought many changes in the environment which have been clearly unfavorable to the fish. These changes have been (1) the construction of dams; (2) the building of diversion ditches; (3) the development of agricultural interests, such as farms, orchards, forests, nurseries; (4) the organization of towns and cities; (5) the establishment of factories and industrial enterprises. Probably in point of time before any of these, came placer mining with its violent overturnings of natural soil.

All of these enter into relations with the river which necessarily modify its original character. The changes are usually made without consideration of their effect on the stream as the home of the fish and in most instances affect unfavorably the welfare of those and other forms of aquatic life. It is important to consider in detail the precise relations involved and the results of the changes made.

Dams interfere with the upstream migration of the adult fish. Under natural conditions the fish penetrate into the smaller tributaries and upper reaches before depositing eggs and milt. To avoid interference with the migration of the fish, dams are provided with fish ladders, the construction and condition of which are all important factors. The dams in the Rogue, at Savage Rapids and Goldray, are equipped with ladders, but at the time of my visit they were not operating well. More extended study would be required to determine whether this was only a temporary condition and how far it affects the welfare of the fish. The same conditions were reported by Ledgerwood who studied the river in August, 1936 (see below). No special devices were found to aid the young fish in their journey down stream. It looked as if the migrating young would be drawn into the turbines and destroyed. No study was made of this problem.

Dams also modify the natural temperature of the river water. This factor was studied in August, 1936, by Edgar Ledgerwood, from whose report to the Oregon Fish Commission the following data has been taken. Above the obstructions the temperature of the river water rose on the average 1° F in 6 miles. At Goldray dam it mounted to 3.5° F in one mile, and at the Savage Rapids dam, while average daily temperatures remained about equal, the minimum was raised about 2° F, and the water in the fishways reached 72° F, a level distinctly unfavorable to salmonoid fishes.

When cooler water from lower levels behind the dam is drawn into turbines and discharged through a tailrace, this stream of lower temperature proves a strong attraction to adult fish ascending the river in search of spawning grounds. The fish attracted to the tailrace fight, of course in vain,

to find access thus to upper levels and many attempts have been made to bar them from this stream. Similar deceptive streams start from leaks at lower levels in dams and draw the fish away from ladders that have been constructed to furnish them access to the water above the dam. As ladders are naturally fed by surface water from the basin behind the dam, they carry a stream warmer than the flow from the tailrace and from leaks near the base of the dam. Under these circumstances the adults are at least delayed, if not injured, on the trip to the spawning grounds, but as yet studies have not been made to determine the loss due thereto.

The plans proposed by the Reclamation Service (Bull. U. S. Geol. Survey 638-B) for transforming the stream into a power-producing element by constructing 34 possible dams, or even part of the maximum efficient number, would undoubtedly entirely destroy the runs of salmonoid fishes and close the career of the Rogue as a rendezvous for fishermen.

Diversion ditches have also modified natural conditions in the Rogue River. The wide open entrance of such a ditch with its inflowing current invites the entrance of aquatic animals, and particularly those living near the surface or feeding along the shore. This includes especially young fish, either fry or fingerlings, seeking to descend the stream and escape into the ocean. Even older fish such as spawned-out steelheads, moved by the same impulse for the sea, will at times enter such ditches. That such is the case abundant testimony can be furnished. Young fish have been watched, often entering such ditches, moving freely down the current, accumulating in deeper holes when the water was shut off, or found dead in irrigated fields. They are seen in miners' settling basins or power-plant reservoirs, are torn to sheds in turbines or ejected with water from the nozzle of a giant. It is immaterial whether the diversion ditch serves a power plant, an irrigation project, a mining enterprise or some other purpose, the fish, young and old, which enter it are condemned to destruction. While the number tempted to enter at any particular moment may be small, it must be remembered that such ditches work day and night until shut off and the total count of fish destroyed is unquestionably large. Most of these conditions I have observed personally on the Rogue and these observations have been confirmed by testimony of others.

Recognizing this serious loss, Oregon has provided by law that the intake of diversion ditches must be screened so as to prevent the entrance of fish. At the Savage Rapids dam an expensive screen has been installed to prevent fish from entering the ditch which takes a large volume of water out of the river. No study whatever was made of the efficiency of this installation, but even casual observation of other ditches showed some to be entirely without protection as well as others in which the screen as placed was worthless. These conditions are responsible for a large and preventable loss in the fish supply of the Rogue River.

Changes in the valley due to human occupation and necessary modifications are significant and in part not usually recognized. The cultivation of farms, orchards, nurseries, and all other agricultural activities, save forestry alone, break up the sod, destroy the underbrush, dry out the soil, drain marsh areas large and small, reduce the capacity of the land to serve as a holding ground for water, hasten the run-off of rain and melting snow, heighten erosion; and all of these influences react unfavorably on the stream as the home of the fish. These conditions are too well known and too often discussed to call for further notice here.

One other feature is less widely recognized and deserves mention because of its intimate relation to the welfare of salmonoid fishes. The diversion of river water through ditches, its disperson over fields, and slow return to the river by seepage channels results in raising the average daily temperature of the river during the dry summer season. This is certainly significant in the case of a stream like the Rogue where the water temperature at this season is near the upper limit of tolerance for salmonoids. One can hardly doubt that the water of the river is on the average warmer in summer now than it was 100 years ago before the cutting of the forests, the mining of the soils and the creation of farms began. These changes are inevitable, but no one would wish it otherwise. Some modifications of natural conditions must be accepted if the land is ever to be made useful for human homes and the prosperous existence of man. Temperature conditions in the Rogue River have not yet changed sufficiently to make the river unsatisfactory for fish life, but the destruction of forests around its sources and on the

mountainous areas of its lower reaches will certainly threaten its supremacy as a famous fishing ground and should be controlled with the utmost care.

The influx of population into the valley of the Rogue led as elsewhere to the organization of towns and cities, and also to the establishment of industrial plants, such as canneries, factories, packing plants, and other establishments which yield considerable amounts of waste that as usual are discharged into the streams. These materials are often distinguished as domestic sewage and industrial wastes, but are actually not separate types. Under present day conditions both are ordinarily mixed and discharged through collecting systems, i. e., municipal sewers. These wastes contain organic materials in process of disintegration or chemical substances which are by-products of industrial plants. The latter are often toxic in character and the former take up oxygen with such avidity that the water of the stream is deprived of this essential element. Either condition is serious and in the extreme case fatal to the fish. Young fish are most sensitive to these as to other unfavorable conditions.

The establishment of sewage treatment plants by the larger communities in the Rogue valley has been adequate to meet present dangers. The stream is now free from toxic chemicals and the oxygen content is adequate at all points tested. But the growth of other communities, the establishment of isolated canneries or manufacturing plants and the use of industrial processes involving chemicals of a toxic nature may discharge into the river at any time untreated wastes which will seriously threaten the welfare of the fish. Such occurrences in other regions have resulted in the sudden destruction of large numbers of fish. It would be deplorable if ever such a misfortune befell the Rogue.

PRESENT CONDITION OF ROGUE RIVER SYSTEM

MY SURVEY AT LOW WATER

The relations of any organism to the environment are complex and the relative importance of any single factor difficult to determine definitely. Superficial conditions are always most apparent but often of minor significance if any in the solution of a given problem. The first step is necessarily the precise determination of the facts at issue. Only after those have been precisely determined can the causal relations be profitably discussed. At the outset of my study I was forcibly impressed by the mass of wild statements current regarding the condition of the river and the fish. Even among those who lived near the river, fished at all seasons in its waters, knew the pools and the habits of the fish and were not influenced by relations that might warp their judgment of actual conditions, there was wide difference of opinion regarding the condition of the river and the number of fish as well as the cause of changes which all agreed had taken place.

It was of primary importance to settle if possible some of the facts in dispute and my attention was first directed to the river. Since the most serious complaints came from the part of the stream which was below the points at which placer mine run-off reached the main river, it was decided to begin the study near the mouth and work up stream. The work started the first of September and at that time the river water stood at or near the lowest level reached in the course of the year. Placer mining in the district had stopped some weeks earlier; stored up water supplies had been drained and no rain had intervened to complicate the situation. In consequence the river water was remarkably clear and free from products of erosion, the current ran slowly, pools were drained down so that the flowing water rippled lazily over gravel bars. One could see with clearness the records of earlier water levels on the banks and bars and read from a boat the actual condition of the bottom in all save the deepest spots in the pools. No period could have been more favorable for determining the real condition of the stream and the deposits made at various levels.

A trip was made on September 6 in a fishing boat from Gold Beach to Agness. I was accompanied by Mr. Nixon and Mr. Swartley. Evidences of stream activity at various periods were sought for with great care. Floating materials stranded high on the banks marked the extreme limits of high water; more abundant deposits were found in back waters, on shelving beaches above the existing water level and reaching down to the margin of the water; even on the stones in the pools one could find evidence of stream deposits of recent date. From point to point we landed on the shore, studied the features noted, measured the thickness of the deposits, determined roughly the materials of which the deposits were composed, scraped samples from the surface of the larger stones in protected corners where the covering was thickest and discussed together the amount and origin of these deposits. I made extended field notes on the color, thickness, consistency and physical character of these deposits as well as of the areas involved and their relations to rocks, promontories and direction of stream flow. Since these deposits had occupied a prominent place in statements both written and oral regarding the condition of the Rogue, extreme care was devoted to recording every detail of the situation that could be found.

The area covered by these deposits was conspicuous. As the river channel shifts from bank to bank the deeper water forms a series of crescentic areas reversed in direction and joined at the tips (Fig. 1). The crescents vary in proportions but are essentially uniform in type. The shore which faces the concave side of the crescent has usually a longer, gentler slope (Fig. 2) and these beaches which showed clearly the deposit were from one to several times the area of the low-water river itself. They formed thus conspicuous features of the landscape. On some of them were prominent longitudinal bars of coarse gravel sharply set off from the stream (Figs. 3, 4). In other places the slope of the beach was longer and gentler. Sometimes rocky headlands (Fig. 5) or strings of smaller rock masses along the shore broke up the formal pattern to some extent (Fig. 6). In sheltered spots behind such rock masses one could find deposits of almost pure sand, varying in depth from half an inch to a foot or more, but in number and total volume such deposits were small in comparison with the length of the stream and the area within the high-water marks on the banks.

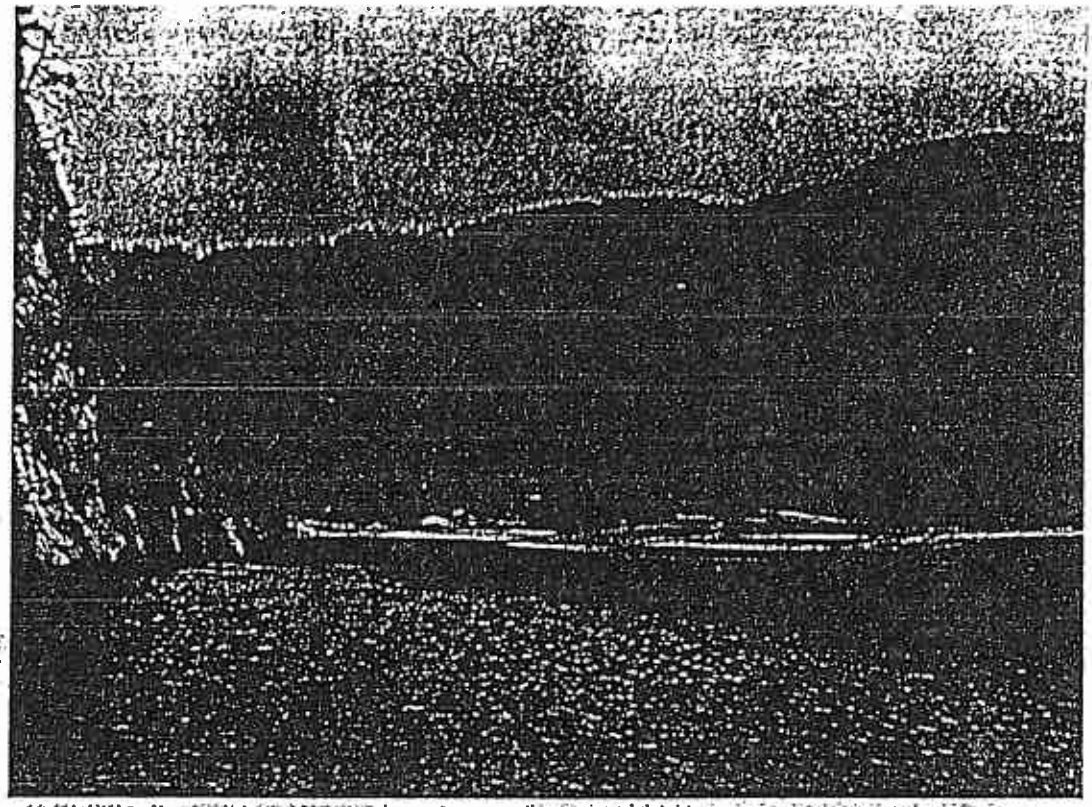

FIGURE 1—*View of riffle where one crescent of river connects with the reversed crescent next below.*

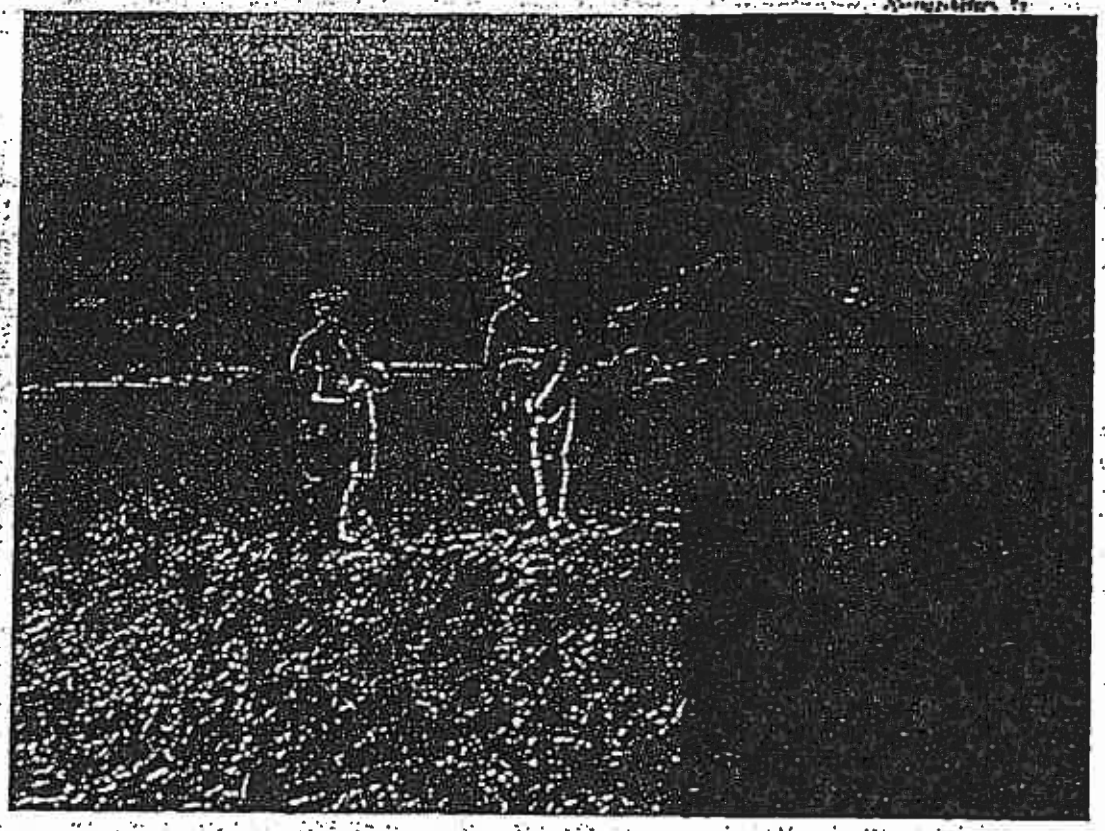

FIGURE 2—*Wide, gently sloping beach between high and low water levels on Rogue River near the mouth of the Illinois.*

The area within which rocks and stones were covered by the material deposited from the river water was not only considerable in extent but it was conspicuous by virtue of the color of the deposit. That was of a pale reddish yellow hue varying somewhat in intensity or density of coloring but still of a characteristic shade in sharp contrast with the clear greenish water and the darker green of the vegetation or the dull colors of the rocks. In fact, as we rode up stream in the motor boat such areas came out with striking distinctness at every bend when we passed from one pool to the next and the sloping beach with its painted stones was shifted from side to side. No one observing the situation could fail to be impressed with this as the most conspicuous feature of the landscape. Apparently the deposit stopped just at the water's edge, but closer observation showed that stones under water were covered with a similar deposit that needed only to be dried out to attain the appearance of that on the stones of the bank above the water level. At one extreme, stones that were not coated at all or only faintly were located at or near the upper limits of the high water, showing that the material was not present in equal amount or the conditions for its deposit were not favorable at maximum high-water level. But by contrast over the lower half, more or less, of the interval between high water and lower water limits all the stones on the sloping beaches and even the rocky promontories and steep rock faces, which in a few places margined the stream, were colored similarly by this conspicuous deposit.

The amount and character of the deposit was also carefully studied. We landed often and examined at close hand the stones of the beaches, sought to measure the thickness of the deposit on stones at varying levels and in different areas along the course of the river. It varied more in amount than in color; at some points it was so thin that only with difficulty could a sample be scraped off the stone even with the aid of a knife. On rough, broken, nearly vertical rock surfaces the color was distinct, but the material too scanty to get any sort of a sample. Under unusually favorable conditions flat stones lying fairly level carried a layer of the deposit estimated to be 1/16 of an inch thick. In one place, namely in a backwater behind a large rock where there was a considerable deposit of sand, I found a crust about 1/8 of an inch thick. It was so friable or "crumbly" that portions could hardly be removed without breaking up into powder even under careful manipulation. The surface of the crust was like that on the stones, but it graded without visible boundaries into the sand below, and as the crust was lifted grains of sand fell off leaving some still loosely connected to the upper part in which also some sand grains could be seen. At the first attempt to follow up the structure of the crust, it collapsed into a mass of loose sand grains with a small quantity of a fine powder. When still undisturbed on the surface of the sand or on stones where it was much thicker and devoid of larger sand grains, the surface of the crust was traversed by a multitude of small furrows running in every direction and reaching down into the crust. These furrows divided the crust into small, irregular blocks measuring ½ inch or less in maximum diameter. They resembled in miniature the broken surface of dried-out mud. The crust has thus scanty volume, imperfect continuity, and little or no adhesion or cohesion.

Samples of this material were obtained at different times from points on the Applegate River, from both forks of the Illinois River, from various creeks tributary to these or the Rogue, and at numerous places on the Rogue River itself. In gross appearance the samples were alike and manifested similar physical characteristics when handled. At most one could note only slight differences in the color of the dry sample.

When samples of this crust were added to water, thoroughly agitated and left to settle, the sediment settled out in 24 hours, but the water was still colored and held in suspension a small quantity of very fine material. After standing 44 hours the water was perfectly clear. When tested this water showed a very small amount of colloid material which could not be measured in any such rough determination. It probably agreed substantially in amounts with the exact measures given in the Lazell determination (see later). All of these tests show that the amount of colloidal material in the water of the Rogue River and its tributaries below the point at which the run-off of placer mine workings has been added to the stream is too small to produce on the bottom a "blanket" which might affect adversely young fish, eggs in nests if present, or the fish food in the water.

I have discussed this deposit at length so that its character may be clear even if its source is uncertain. It may be derived from natural erosion and it may come from placer mining as artificial erosion. It is more likely to come in part from each

of those sources. However that may be it is not entitled to be called a "blanket" or to be charged with injurious or destructive influences on the fish life of the river. Certain fresh water formations are designated "blankets" because they cover the bed of the streams or lakes so thickly or imperviously that they smother the aquatic life there and prevent its multiplication as well as its growth. Thick cohesive mud layers, deposits of petroleum refining wastes or of some other chemical industries, sludge from domestic wastes and similar substances form continuous, resistant, impermeable layers which rightly are designated as "blankets". Their physical, chemical, and ecological differences from the deposit I have just described in detail are too evident to call for further analysis.

During the month of September our study was extended to cover the Rogue River and its tributaries. The work was carried to points well above all traces of placer mining and of all influences of human interference. Throughout this period conditions were uniform; minimum water level, sluggish current, lack of suspended materials and consequent clear water in the river at all points made it possible to investigate deposits, food supply, and general conditions for fish life thoroughly and reach some definite conclusions. Sewage treatment plants visited at Grants Pass and Medford were being operated well and no evidence was found that domestic or industrial wastes had been released without proper treatment. No extensive or dangerous deposits of any sort were seen at any point. Even below the points at which tributaries entered from areas in which placer mining had gone on at earlier months in the year, no changes from normal conditions were observed. The pools sheltered migrating fish; they were also seen in the stream below the dams, and a normal supply of fish food was found at various points visited. While the fishermen reported scanty catches, or none at all, this condition was apparently due to inactivity on the part of the fish, and that might well be attributed to the plentiful food and lack of stimulating weather.

The data just given summarizes results of the work done in the field last September. That was the period of low water, little or no precipitation and no placer mining. It was deemed important to study the river at the time of high water when the mines were in full operation. The preliminary report submitted at this time was regarded as subject to modification on the basis of later studies.

ROGUE RIVER SYSTEM AT HIGH WATER

Conditions found on the second visit, during March and April, contrasted strongly with those just described during September, 1937. The water in the river was very high and remained at a high level during my entire stay. Consequently observations on fish and their activities were limited. It was impossible to secure any data on spawning grounds below Grants Pass. However, at that stage of water the fish were hardly likely to stop for spawning in areas where the depth and strong current made conditions so unfavorable. The placer mines were operating actively and the run-off was a conspicuous feature in smaller tributaries and at points on the main river also.

The water supply of the placer miners was about at its maximum and consequently the run-off and its burden of soil materials washed out by the operations were also at a high level. Accompanied by Director Nixon and in some cases by Dr. Griffin also, I visited some of the largest and most active of the operations. Samples of the run-off were taken at points where the stream was first turned out from workings into a watercourse and then at points farther down the creek in order to determine how rapidly the original concentration was diluted. The results of these studies are discussed in a later section of this report. In general it was evident that the amount of material in suspension was reduced more rapidly than the appearance of the water changed. The color of the run-off coming from those workings being carried on in brilliant red deposits was particularly persistent while the amount of material in suspension (ppm) fell off rapidly.

An examination of the Rogue and its tributaries made at a period intermediate between high and low water would disclose, no doubt, some features of the situation not determined at the time of either visit I made to the region. Indeed it would be valuable to continue a study of the stream throughout the entire year. Such an investigation would furnish a solid foundation on which to build regulations for preserving and developing rightly all of the resources of the region. Without such a complete record of the changes from one period to another and of the varying relations between different influences the exact effect of the work done on a single resource can only be roughly determined. The proper solution of all the complex factors involved can only be found by securing

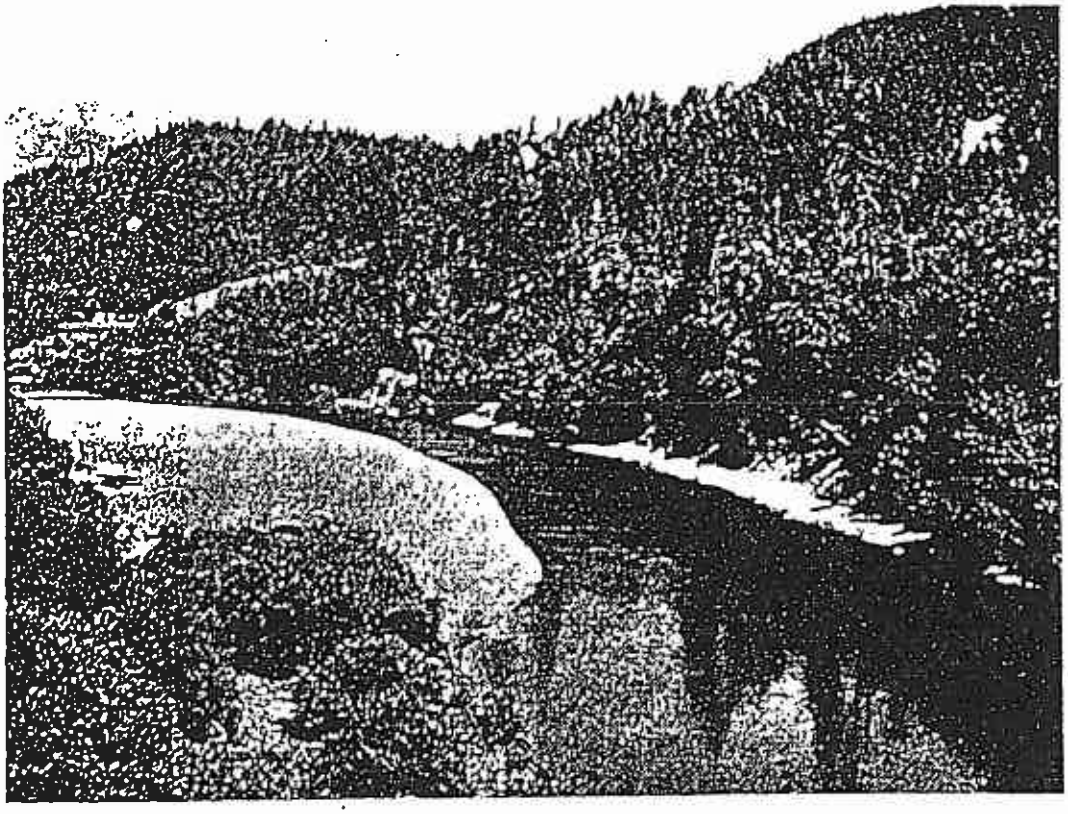

FIGURE 3—*Crescent of river above bridge at Agness showing beach with sharper bank at low-water level*

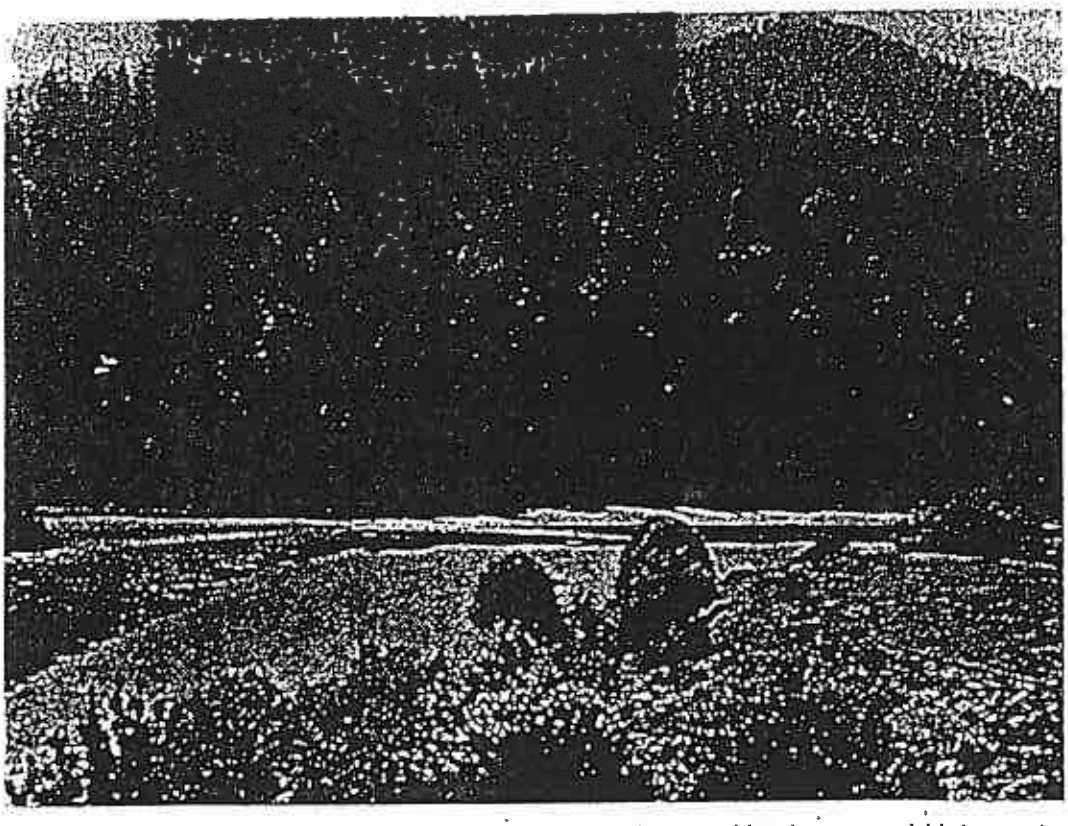

FIGURE 4—*Crescent with longitudinal bar of coarse gravel on outside of curve and higher rocky bank with vegetation inside curve. Taken at junction of Rogue and Illinois rivers.*

much larger knowledge and more perfect coordination of all interests involved.

In connection with this section giving the record of the survey made on the Rogue River it is appropriate to call special attention to the value of the assistance given me in different parts of the work. It would not have been possible to start the study and carry it out so promptly without the personal attention afforded me by Director Nixon. Frequent discussions with him enabled me to follow up details I wished to study without loss of time. His frankness in recognizing the dangers in the situation and his constant efforts to find a fair solution of the problem made his assistance inspiring as well as constructive.

The supplementary report of Mr. A. M. Swartley, who aided me in the part of the survey made in September, 1937, is of value in giving the views of a careful and experienced geologist. He confirmed fully statements I had reached in my preliminary report as to the physical conditions found in the Rogue River drainage, and especially the small amount of clay and other fine material on shores and stream bottoms, in backwaters and otherwise in our examination of the river and its tributaries. He discussed fully the methods of rock disintegration and decomposition and the transportation and ultimate character of the materials produced. He emphasized the fact that mining debris "is chemically inert, makes no oxygen demand on the stream and therefore takes away from the flowing water nothing which the fish require. This is equally true of this material whether placed in transit by nature or by man since [the products] are alike in nature, come from the same sources and are only being accelerated by man in their journey to the sea." Further he stated: "All these materials entering the streams, whether by natural or human activity, whether coarse or fine, whether traveling on the bottom, in suspension or solution, are almost altogether inert, suffer little change on their way to the sea, and having reached the end point of chemical change * * * do not rob the water of oxygen which the fish demand, or add to the water toxic agents injurious to fish" [fish food or other forms of life]. The portion of this report printed as Appendix A includes only a few of the items of special importance in connection with features I am discussing in this my own report.

The appended summary in Appendix B of experiments by Dr. L. E. Griffin on young fish in water carrying a heavy load of natural soil materials gives strong support to the conclusions from stream study. The mud came from the placer mining region in the Illinois River drainage basin; the fish were of species found in the Rogue River basin.

These experiments are unique. To be sure adult fish have been kept in water loaded with sawdust and with pulp or paper mill waste, so that much has been ascertained concerning the effects of certain types of material on adult fish. Also a long series of valuable experiments has been conducted by Shelford and his students on the effects of particular chemicals on adult fish. Further in Oregon, Finley and his associates have tested the results of placing young salmon in diluted municipal wastes and found the fatal effects of such an environment to be almost immediate.

In contrast with all these the experiments of Dr. Griffin have shown that young fish live well up to 30 days in good water mixed with an amount of natural soil materials from two to three times as large as the extreme load of the materials contributed to the Rogue River by maximum conditions produced by placer mining. These findings are discussed later in greater detail.

PLACER MINING AND WELFARE OF FISH

It is essential now to consider with exactitude the process of placer mining, the character of its by-products or materials discharged into the streams in the Rogue valley and the effects on the fish of the river at all periods in their life history and under the varying conditions in the stream at different seasons. In this consideration we are concerned only with those features designated properly as biological that have some influence direct or indirect on the life of fish. Problems involved in the construction and maintenance of dams and diversion ditches have been given adequate mention in the earlier portions of this report.

Placer mining is pursued in the Rogue River district by dredging and by sluicing or hydraulicking. The dredges are employed in only a few places and on extensive level areas where settling basins are provided. Under these conditions the final run-off as discharged into the Rogue or some tributary is free from silt and consequently may be left out of further consideration here.

Placers which are mined by hydraulicking and sluices are located in rough territory, very often in narrow gulches where settling basins are me-

chanically impossible so that the run-off passes into the Rogue River directly or into a tributary from which it ultimately reaches the main stream. The water used is usually obtained by a diversion ditch which taps some tributary at a higher level and is thus in itself of fine quality. Accordingly the character of the run-off is determined by the materials in the soil which is broken up by the action of the water employed. The water carries a heavy burden of soil materials regularly designated as waste. In a large part of this region the run-off is highly colored and criticism has been particularly violently directed at the conspicuous and persistent color contributed to the stream. All of the materials involved deserve further consideration.

Attention must first be directed to the various meanings attached to the word waste or wastes. In mining, waste is "superfluous or rejected material not valuable for a given purpose". In physical geography, waste is defined as "material derived by mechanical and/or chemical erosion from the land, carried by streams to the sea." Wastes may thus consist of or include materials unchanged in nature or those which have been chemically altered, i. e., natural constituents of the soil or new substances produced by chemical action. The placer mine run-off is waste in the sense that it is superfluous and unserviceable material, but it is not material that has been modified by processes of manufacturing or chemical treatment. The placer mine run-off is composed of good water and normal unaltered soil; it carries no materials that can rightly be called *deleterious substances*. This distinction is fundamental and should be emphasized.

To designate placer mine run-off as pollution is a confusion of terms. Neither in dictionary definition nor in scientific analysis can the use of this term be justified. To pollute is to defile; to contaminate with wastes of man or animals; this is done by introducing domestic or community wastes, or such as are produced in manufacturing and industrial processes. Chemically these include toxic materials or unstable compounds which have a high affinity for oxygen and withdraw promptly so much oxygen from the water that they threaten the life of organisms in it. Trout and salmon prefer waters which are surcharged with dissolved oxygen and they are sensitive to any diminution in the oxygen supply. They are also sensitive to domestic and industrial wastes, i. e., foreign substances. But the substances carried in the water coming from placer mines are those common to the soil of the region. They are stable compounds and make no draft on the oxygen content of the waters. Washings from placer mining have been poured into the Rogue River in quantities since 1850 and even when the stream was crowded with the immense runs of salmon, which characterized it in earlier days, the fish found these waters favorable for their existence; they maintained their runs.

Evidence of the character and effect of erosion materials is given in an important publication on the Detection and Measurement of Stream Pollution (Bulletin U. S. Bureau of Fisheries, No. 22; 1937) by Dr. M. M. Ellis, in charge Interior Fisheries Investigations. On page 432 Dr. Ellis points out that erosion silt has no effect on streams (a) in decreasing dissolved oxygen, (b) in increasing acidity, (c) in increasing alkalinity, (d) in increasing specific conductance, (e) in increasing ammonia, or (f) in specific toxic action on fishes. In his tabulation of effects under the headings of bottom pollution blanket and increase in turbidity, he indicates that erosion silt and other suspensoids have a critical limit which is discussed in detail at another point in his paper (p. 394). The dangers which he sets forth there are not one of them present in the Rogue River, as I shall proceed to show in detail.

In the Rogue River I have already noted the absence of any continuous layer of erosion materials which could possibly be designated as a *blanket*, or cover fish foods, nests or spawning ground with an impermeable layer. Cole (1935) has demonstrated experimentally that fish move uninjured through very muddy waters. Swartley in his supplementary report gives a table of the amount of suspensoids recorded in a group of streams, some of which are good salmon rivers; these carry from 137 to 395 ppm of solid materials and have turbidities varying from 27 to 245. In his experiments Griffin maintained for some weeks young salmon in good condition in water containing more than 1000 ppm of mud from placer mine areas in the Rogue River valley, whereas the maximum amount actually found in water taken from the river at Agness was 440 ppm (See Table II, p. 21).

Placer mining does not burden the stream with foreign materials or with substances that are toxic or inimical to fish life. Its processes contribute to the normal burden of the stream the same materials which are brought down from the hillsides of this area and no substance is involved which is

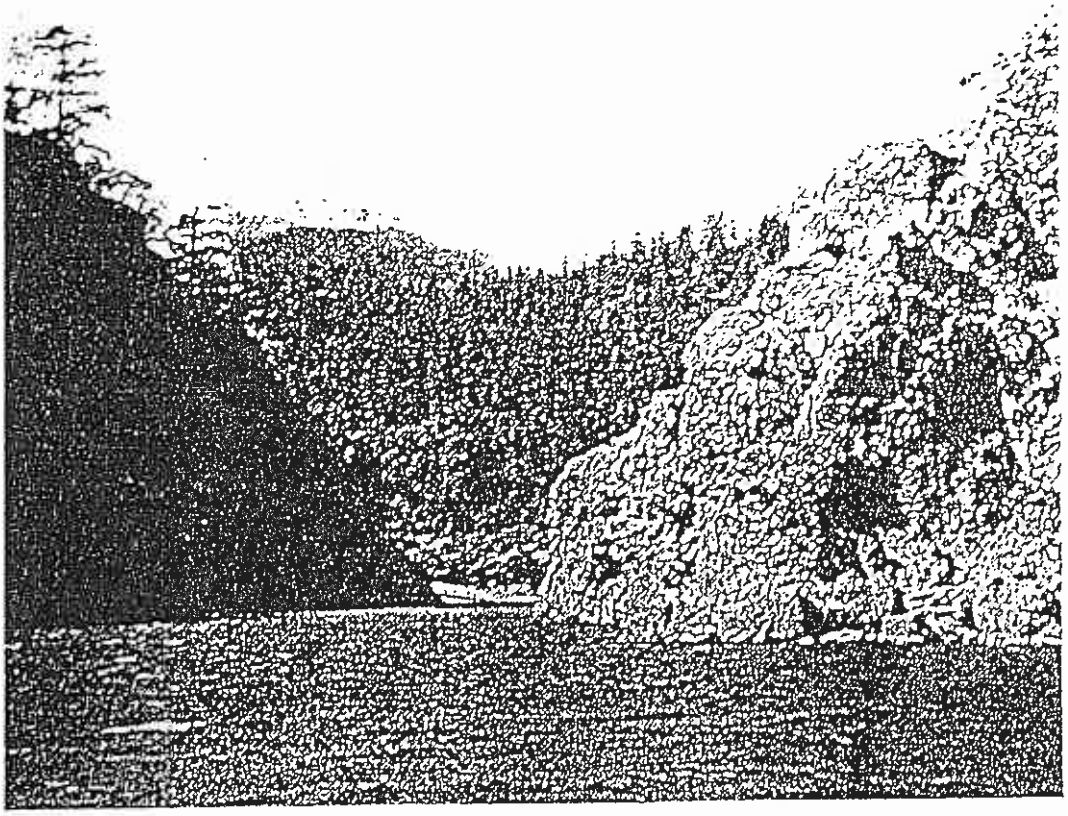

FIGURE 5—*Bold rocky promontory. Rock marked by color of thin layer of deposit below high-water level.*

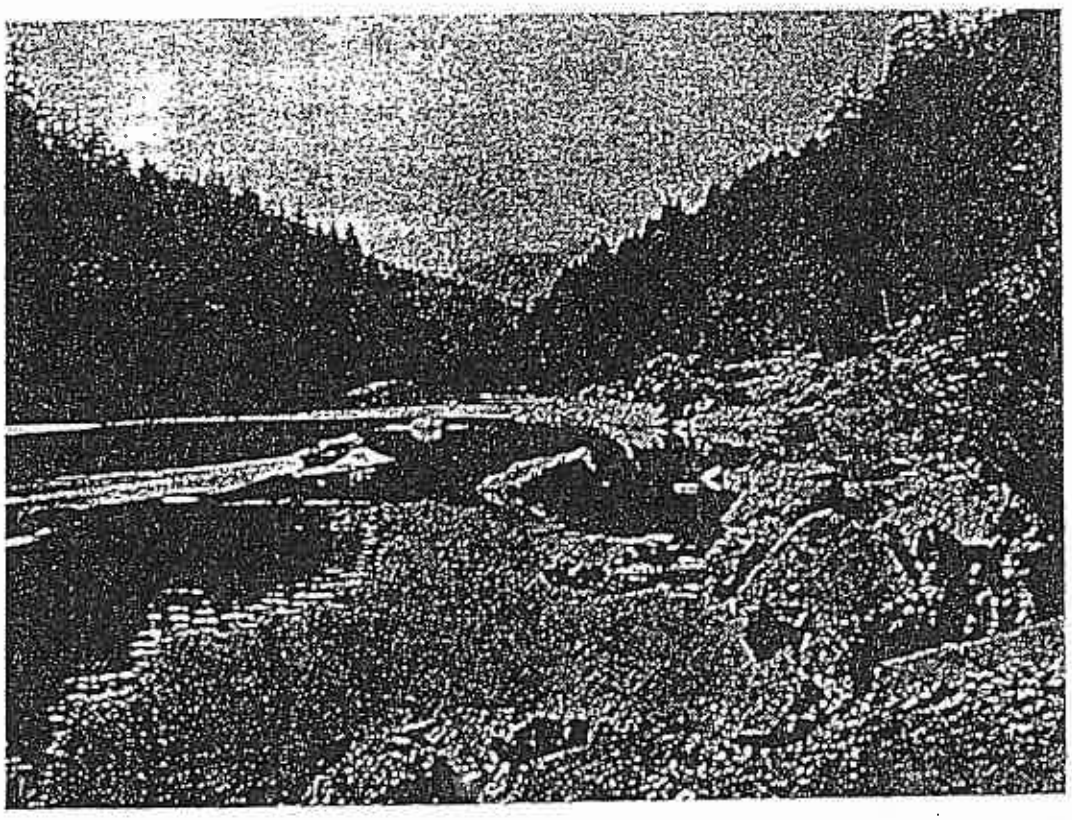

FIGURE 6—*Scattered rocks along shore with bed of sand in right foreground.*

foreign to the materials the stream has carried for centuries. Not one of the particular materials listed or discussed by Ellis in his paper as constituting stream pollution hazards is found in the placer mine run-off of the Rogue.

An analysis was made of the dried soil from placer mines used in making the muddy water experiments carried on by Dr. L. E. Griffin (see Appendix B). The analysis was furnished by Dr. E. W. Lazell of Portland Chemical Laboratories. The protocol of this test follows:

Laboratory No. 39058.

Alumina 15.24%

Total Sulphur .002% equals .005 sulphuric anhydride.

Settling Test

Time	*Percent in Suspension*	*Particle Size Microns*
2 hours	0.15	40
6 "	0.048	22
24 "	0.027	9
48 "	0.25	5

The particles remaining in suspension 48 hours are amorphous, having no action on polarized light.

Assuming 5 microns as the maximum size of a mineral colloid, the maximum amount would be .025%.

The material of which this analysis was made was taken directly from banks on which placer miners were working or had been working. The placer mine run-off secures its load of suspensoids from the same banks that furnished this material and has no other source of the material it carries.

Actually the process of placer mining adds no new material to the water of the river and produces no change in the aquatic environment except in quantity of soil materials found in the river at a given time. Now the exact amount of such material in the river has changed often radically and rapidly during each year in the past history of the river. Natural variations in climate make natural erosion work variable and with rapid and unpredictable as well as violent changes at unexpected intervals as well as from season to season. So long as materials remain of the normal type found in local soils the quality of the water is unimpaired and neither old nor young fish suffer. We can find no way to distinguish between the effects of placer mining (*artificial erosion*) and those of rain and flood (*natural erosion*). They differ at most only in degree and intergrade at different stream levels. Both comparative data from other streams and experimental evidence with placer mud from the Rogue River area seem to indicate clearly that the limit of tolerance has not yet been reached here. As the stream flow in the river tapers off seasonally, the drop in miner's water reduces somewhat similarly the run-off from the placer mines, so that the concentration is not likely to exceed the amount employed experimentally without harm to the fish.

The run-off from placer mines in the Rogue River area is characterized by its deep red color which is strikingly persistent as well as conspicuous. This is a finely divided iron compound, probably iron rust, a stable compound, and contrary to common opinion in the region, not in the least injurious to the fish. It may contribute to the opacity of the water and perhaps also makes it difficult for the fish to see the fly, although Dr. Griffin found that young fish readily saw and promptly captured food thrown into the tanks in his experiment. However, if the fish cannot see or are not attracted by the caster's lures, the condition of the water may reasonably be said to protect the fish, even though it disappoints the fisherman!

TURBIDITY OF ROGUE RIVER WATER

The turbidity of the Rogue has been measured regularly by Mr. Edward N. McKinstry, engineer of the waterworks at Grants Pass. I am indebted to him for the following data which cover the hydrogen ion concentration (pH) as well as the turbidity of the stream during the period October, 1937, to May, 1938, inclusive. These data are recorded daily at that station and give a very good picture of the condition of the river above the region in which it receives the run-off from placer mining operations. The determinations of turbidity are recorded there by visual comparison with standard solutions made from water and fuller's earth in accordance with specifications of the La Motte Chemical Company. This method is recognized as standard for such analyses, and is widely used. At the same time I wish to call especial attention to the fact observed by several of us independently: the color of the sample affects the result, indicating a higher apparent turbidity than actually exists. (See Table I)

Turbidity samples were taken from the Rogue River at Agness from January to April inclusive

and are given in the following table. These represent the condition of the river water after all contributions of placer mine run-off have reached it. These samples were delivered to the Department in Portland and the determinations were made by Dr. L. E. Griffin. (See Table II)

In March Dr. Griffin accompanied Director Nixon and myself in a survey of the chief points in the Rogue River valley at which placer mines were operating at that time. Samples of the run-off were taken at the seat of operations and in the small streams at places between the workings and the Rogue River. The determinations of turbidities in these samples were made by Dr. Griffin later. In all determinations he used a photo-electric cell apparatus constructed by Professor Day of Reed College on the general principle of that described by Ellis in *Science*. These determinations, though accurate for practical purposes, were found to be influenced by the color of the sample. (See Table III)

Comparison of these records with those of the river at Grants Pass shows that only two (Nos. 10 and 12) taken on small streams close to workings were in excess of the concentrations recorded this year for Grants Pass where no placer mine contributions were involved. Sample No. 13 from Coyote creek equals the Grants Pass maximum for the past winter as recorded on February 6; the next largest sample we took (No. 6) came from the middle of Fry creek near O'Brien with 630 ppm; it only barely exceeds the second Grants Pass record this winter, viz, 600 ppm on March 23, while at No. 7 only one-eighth of a mile down stream from the point of No. 6 sampling this concentration had fallen from 630 ppm to 165 ppm and 450 feet further down stream it had dropped to 105 ppm much below concentrations observed on various dates at Grants Pass during this winter. (Compare Table I with Table III)

The extremes of concentration of placer mine run-off which we could find were represented by

TABLE I

DETERMINATIONS OF ROGUE RIVER WATER AT GRANTS PASS

Date	Oct.		Nov.		Dec.		Jan.		Feb.		Mar.		Apr.		May	
	pH	Turb.	pH	Turb.	pH	Turb.	pH	Turb.	pH	Turb.	pH	Turb.	pH	Turb.	pH	Turb
1	7.3	8	7.3	15	7.1	15	7.2	20	7.1	50	7.3	30	7.1	20	7.1	2
2	7.3	8	7.1	12	7.1	15	7.2	15	7.1	45	7.1	30	7.1	20	7.1	3
3	7.1	8	7.1	10	7.1	15	7.1	30	7.1	150	7.1	30	7.1	20	7.1	3
4	7.1	8	7.3	10	7.1	12	7.3	15	7.1	60	7.1	30	7.1	20	7.1	2
5	7.1	8	7.3	10	7.1	10	7.2	15	7.3	30	7.1	30	7.1	20	7.1	2
6	7.3	10	7.3	10	7.1	10	7.1	15	7.1	700	7.1	15	7.1	15	7.1	2
7	7.1	12	7.4	10	7.1	10	7.1	10	6.9	500	7.3	15	7.1	10	7.1	2
8	7.3	12	7.3	10	7.1	10	7.1	10	7.1	325	7.3	15	7.1	10	7.1	2
9	7.7	10	7.3	10	7.0	7	7.1	25	7.1	100	7.3	10	7.1	10	7.1	1
10	----	----	7.3	10	7.1	30	7.1	10	7.1	85	7.1	10	7.2	10	7.1	1
11	7.5	10	7.1	50	6.9	350	7.1	10	7.1	85	7.1	10	7.1	10	7.1	1
12	7.3	10	7.1	75	7.0	225	7.1	10	7.7	50	7.3	10	7.1	10	7.2	1
13	----	----	7.1	30	6.9	60	7.1	12	7.1	60	7.3	15	7.1	10	7.1	1
14	7.1	8	7.1	30	6.9	40	7.1	20	7.1	270	7.1	15	7.1	10	7.1	1
15	7.1	8	7.1	50	7.1	30	7.1	80	7.1	80	7.1	15	7.1	10	7.1	1
16	7.1	8	7.1	25	6.9	25	7.1	35	7.1	40	7.1	160	7.1	10	7.1	1
17	7.4	8	7.1	20	7.1	20	7.1	40	7.1	35	7.1	60	7.1	15	7.1	1
18	7.1	12	7.1	70	7.1	18	7.1	225	7.1	35	7.1	45	7.1	15	7.1	1
19	7.1	12	7.1	200	7.1	15	7.1	80	7.1	35	7.1	200	7.1	35	7.1	1
20	7.1	12	7.1	400	7.1	15	7.1	35	7.1	35	7.1	80	7.1	35	7.1	1
21	7.1	12	7.1	90	7.1	15	7.1	30	7.1	35	7.1	35	7.1	35	7.1	1
22	7.1	12	7.1	25	7.1	12	7.1	100	7.3	25	7.1	50	7.1	20	7.3	1
23	7.5	12	7.1	40	7.1	10	7.1	80	7.1	25	7.1	600	7.1	20	7.3	
24	7.3	12	7.1	25	7.1	20	7.0	35	7.1	60	7.1	225	7.1	20	----	-
25	7.5	12	7.1	20	7.0	10	7.0	20	7.1	50	7.1	150	7.1	18	----	-
26	7.3	12	7.1	15	7.1	10	7.0	15	7.1	45	7.1	50	7.1	18	----	-
27	7.3	12	7.1	15	7.1	15	7.1	10	7.1	40	7.1	40	7.2	18	----	-
28	7.3	11	7.1	15	7.1	12	7.1	10	7.1	40	7.1	40	7.1	15	----	-
29	7.3	11	7.1	15	7.1	90	7.1	12	----	----	7.1	35	7.1	12	----	-
30	7.5	11	7.1	15	6.9	80	7.1	10	----	----	7.1	30	7.1	20	----	-
31	7.1	10	----	----	----	----	7.1	10	----	----	7.1	25	----	----	----	-

* From E. N. McKinstry, Grants Pass.

sample No. 10, just below the sluice of the Fry pit, with 7,840 ppm and No. 12, at the escape of a working on Coyote creek, with 38,000 ppm. In both cases the concentration was greatly reduced on the small stream a short distance below the point of actual discharge. Fish were seen in Coyote creek above the point of entrance where the sample was taken; they probably had ascended the creek and had passed through the water, although the discharge may not have been as heavy at the time when they went up that section of the creek as it was at the time that sample No. 12 was taken.

EFFECTS OF SILT ON FISH

Popular opinion cherishes an old and widespread belief that sawdust, silt, and similar solid particles carried by flowing waters clog the gills of fish and kill them by suffocation. This opinion is apparently sustained by frequent discovery on streams or banks of dead fish in which the gills are crowded full of fibers and masses of floating materials identified as sand, paper, and pulp-mill waste, etc. Since these materials came apparently from mines and industrial plants, the responsibility for the destruction of the fish was at once charged to the specific industries. The discussion has long waged violently around the lumber, paper, and pulp mills. It is now clearly recognized that those wastes are dangerous because of the toxic substances discharged with the mill wastes or the decay set up in accumulated masses of such wastes, and not in any degree because of any damage due

TABLE II

TURBIDITY DETERMINATION OF WATER TAKEN AT AGNESS

(Made with photo-electric cell by L. E. Griffin)

Date	Turbidity			
	January	February	March	April
1	.....	130	65	73
2	.....	120	103	65
3	.....	210	106	68
4	.....	150	120	77
5	.....	108	76	65
6	.....	250	95	.....
7	.....	267	75	.....
8	.....	440	60	.....
9	.....	153	57	.....
10	.....	157	70	.....
11	.....	152	65	.....
12	.....	156	76	.....
13	.....	168	75	.....
14	.....	175	67	55
15	.....	87	128	57
16	62	*	285	54
17	70	*	220	74
18	55	*	165	68
19	100	135	215	123
20	125	90	180	107
21	127	89	136	76
22	155	88	*	65
23	103	106	*	54
24	135	122	*	56
25	112	125	*	.....
26	102	103	142	.....
27	175	75	134	.....
28	50	70	100	.....
29	60	.....	100	.....
30	103	.....	65	.....
31	55	.....	54	.....

* No sample submitted.

Determinations of pH also were made of 10 samples, all of which were 7.0.

TABLE III

REPORT ON SEDIMENT CONTENT OF SAMPLES TAKEN MARCH 26, 1938

		pts per million
1.	From stream at first bridge beyond Ruch, 2.8 miles below summit of hill west of Jacksonville..	475
2.	East fork of Illinois River at first bridge on Highway 199, south of Caves Junction	25
3.	West Fork of Illinois River. Taken on west bank 50 feet above bridge. First West Fork bridge on Highway 199, south of Caves Junction	30
4.	From bank of West Fork of Illinois River, opposite entrance of Fry Creek, 200 feet above steel bridge east of O'Brien	10
5.	Taken in West Fork of Illinois River, 2 feet above bridge (same as 4) on east bank of river, below entrance of Fry Creek into Illinois River..	600
6.	From middle of Fry Creek, 75 feet above its entrance into Illinois River	630
7.	From east side of Illinois River, ⅛ mile below Fry Creek. Taken from small side channel of river. Water here heavily colored by Fry Creek discharge; other side of river clear	165
8.	From west bank of Illinois River, about 450 feet below 7	105
9.	From west bank of Illinois River, 1,550 feet below bridge. (Same as 4.)	97
	Numbers 5-9 form a series showing how rapidly the discharge of Fry Creek becomes diluted in the Illinois River. At point 9 the discharge of Fry Creek seems to be evenly distributed in the river. Above this point it was heavier on the east side of the river.	
	March 28, 1938	
10.	Sample taken from pool just below sluice of the Fry pit, 1.9 miles above steel bridge and Illinois River. Mine in operation with water flowing through sluice	7,840
11.	Taken from stream at bridge 54, at Bridgeview. Althouse Creek	30
12.	From end of flume at pit working on Coyote Creek, on left of road, operated by Cleveland. Fine bright red soil. Very fine material, much colloidal stuff apparently	38,000
13.	At Coyote Creek bridge on Highway 99. 2.5 miles below point where sample 12 was taken ..	700

to floating particles. Some of the evidence for this may be given.

In 1899 Professor Prince, fish commissioner of the Dominion of Canada, a scientist of high standing at home and abroad, wrote as the conclusion of years of travel and observations on lakes and streams in different parts of Canada, "so far as our present knowledge goes, sawdust pollution, if it does not affect the upper waters, the shallow spawning grounds, appears to do little harm to the adult fish in their passage up from the sea. * * * There is no case on record of salmon or shad, or any other healthy adult fish being found choked with sawdust, or in any way fatally injured by the floating particles". This pronouncement was amply sustained by the researches of Dr. A. P. Knight of Queens University. He began investigations in 1900 and in his first preliminary experiments reported in 1901 found that trout, though badly injured when placed in a mixture of sawdust in water as thick as gruel were healthy and active after two weeks in it. Post mortem examinations showed no trace of damage from sawdust. In a final report published in 1907, he presented at length the results of other observations and experiments on the problem. While his work dealt only with sawdust, the conclusions reached are so significant that I quote some of them *verbatim*: "1. Strong sawdust solutions poison adult fish and fish fry through the agency of compounds dissolved out of the wood cells. 2. The overlying water in an aquarium containing sawdust does not at first kill fish. After about a week it does kill, but solely through suffocation, the dissolved oxygen having all been used up."

In other words floating particles do not damage the fish; but products of decaying organic matter and toxic materials are destructive.

More recently the problem has been studied by Cole (1935) with reference to pulp and paper mill waste. He kept fish three weeks in a gruel-like mixture of pulp. On the basis of his work he states (p. 301), "as long as the fish remained healthy and active their gills were kept clean. * * * It was only when fish were dying that the fibers clogged their gills."

I have myself often observed dead fish with the mouth and gills filled with masses of floating debris which were taken in with the last feeble respiration movements when energy was not sufficient to force the material out through the gill slits. To avoid error and confusion in the mind of the reader, it must be emphasized that sawdust accumulating in streams does serious damage to fish life, but only by the production of toxic materials that are absorbed in the water and by the exhaustion of free oxygen through decay. Similar effects follow the discharge of pulp and paper mill wastes. However, as floating particles in water neither the rough granular masses of sawdust nor the fibrous elements of wood pulp damage the gills or are accumulated on the gills of healthy fish.

It has also been stated that harsh materials such as sand or grit will injure the surface of the gills or accumulate and clog the passage ways. On careful consideration of conditions this appears most unlikely. The abrasive action of such gritty substances is exerted only when they are forced down on surfaces by pressure from behind. Bathers are familiar with the fact that sharp sand and gravel, although carried by a strong current, do not injure or even irritate the soft skin of the human body. Even in a mixture of a density equal to more than 1,000 ppm, the amount of rough solids is so small that the cushioning power of the volume of water is adequate and mechanical injuries are fully prevented.

Fish live and thrive in rivers carrying large loads of silt. One could make a long list of such streams in the central West and on the slopes of the mountains between that region and the Pacific coast. To be sure, all of these do not have salmon runs, but they do carry trout and up to recent times those affording suitable conditions were the home of the grayling, which is clearly more sensitive to adverse conditions than salmon.

Between California and Alaska are many streams which are seasonally, and some of them constantly, loaded heavily with silt that comes from glacial run-off and from bank erosion. Such streams include those which under undisturbed conditions—i. e., before human interference affected the numbers and environment of the salmon—carried large numbers of these fish every year. It has been impossible to secure from the reports of explorers, surveyors, engineers, or government bureaus which have studied these streams and have recorded the heavy loads of materials in suspension which they carry, any precise mathematical data to compare with those obtained for the Rogue River. Nevertheless the descriptions given show reasonably clearly that the amounts of silt in some of these rivers at least were larger than that found in the Rogue at any time. Engineers

and other experienced men have in personal discussion borne positive testimony to this view, both as to the relative amount of silt and as to the presence of vigorous and healthy fish.

I have myself seen and studied numbers of such rivers in the United States and in Alaska which rank among the well-known salmon streams of the west coast and which are heavily loaded with sediments. I shall confine myself to more precise statements of one region. The Copper river in Alaska has been one of the famous salmon streams of that territory. It has a large number of tributaries which come out of mountain ranges east, north and west of the Copper River valley. Some years ago I had opportunity to visit the upper reaches of some of these rivers where the salmon spawn under what at that time were undisturbed natural conditions. Some of these streams were clear, but others were heavily loaded with glacial detritus. I have seen among these Alaska rivers in which salmon run and spawn some so heavily loaded with mud that one could not trace the body of an adult salmon ascending the river even when the dorsal fin cut the surface of the water. Yet the fish examined on the spawning grounds just before and just after death showed that the gills had suffered no injuries on the way though the body had met with conspicuous external damage through violent contact with sharp rocks at rapids or falls or along the shore. The examination was made in connection with the study on the cause of death after spawning and all organs were closely inspected. The gills were reported as apparently in perfect condition. Although the object of the investigation was not to determine the effect on the gills of silt-loaded waters, still, if any evident injury had been present, it would have been noted. The journey from the sea up the Copper and its tributary was long and strenuous; the chance for damage to the salmon from muddy water was certainly large if any damage could be wrought by such conditions, and yet none was observed. Many other similar cases could be cited from printed as well as personal records.

The long period of past time in which the salmon of the Rogue had been subject to the influence of heavily silted waters in that stream and the persistence of a run large in numbers and unsurpassed in quality serves to confirm the views expressed above on the basis of other evidence. The adult fish are not injuriously affected by upstream migration through water as heavily loaded with silt as is the Rogue River.

Strong as this argument is, it must take second place to the results of the experiments on young fish which I suggested and which have been carried out so well by Professor Griffin. His results are fully stated in Appendix B. In further comment I desire to call attention first to the fact that these experiments were performed with young fish. Despite their far greater sensitiveness to changes in environment and susceptibility to injury, the young salmon lived heartily in a concentration of sediment which was at its minimum (760 ppm) twice as much as the maximum recorded at Agness (see Table II). Indeed the average amount of turbidity in Griffin's experiments was ten times the average recorded at Agness. Those who think that normal erosion products will prove injurious to such fish should examine carefully the records in these tables.

EFFECT ON SPAWNING GROUNDS

Erosion silt in some streams has been found to cover nests and spawning grounds with a blanket such that the bottom fauna was killed and eggs also were suffocated in nests. In these ways such a deposit does great damage to the fish population in a stream. Unquestionably this is serious in some places and under some circumstances, and it is important to examine the situation carefully in the Rogue River. This was one of the first items to which I devoted my attention in making the study of the Rogue at low-water level.

In the stretch from Gold Beach to Agness I found no evidence of spawning having taken place in the river. Nowhere could I find any of the characteristic nesting areas in the water or on the beaches between the high-water mark and the then present water level. To be sure the time of my visit did not coincide with the spawning period of any species which occurs in the Rogue so that the absence of freshly formed nests was normal, but in spawning areas one can usually see distinctly traces of nests built a year or even more before the date of the inspection. If any spawning had taken place in this stretch of the river, then the intervening floods had been heavy enough to wipe out all the evidence. Equally clearly the spawning had been of no value since the nests had either been scoured out or covered so deeply that the eggs were killed. I have already called attention to the

film deposited on the bottom and on beaches between high and low water marks and have shown that it is thin, granular and broken. It is in no sense a blanket and would not interfere with the respiration of developing eggs if there were any in this region. Normally the fish cover the eggs by a layer of sand or fine gravel; the fresh water carrying oxygen easily penetrates this cover and the young wriggle out after the eggs hatch. A thin, broken layer such as I have already described would not interfere with the permeation of fresh water with oxygen and the development of such eggs as might be present. But I am clear that this is not a true spawning area. As Mr. Joseph Wharton said in an admirable paper on the salmon of the Rogue River, "It is the ambition of all these species of anadromous fish to ascend the river to the highest point attainable before making their spawning beds, seeking the waters that are purest and coldest." This statement is absolutely correct; in difficult streams or when held behind man-made barriers, these fish struggle to the end to make their way upstream and will sacrifice life rather than accept spawning areas in the lower reaches of the river. The urge which drives them on is the basis for the safety of the race. For the straggler or the weakling who may find the achievement of headwaters impossible, an enforced spawning in the lower river is of no significance; the river level varies too widely and its current at full flood is too fierce. Eggs deposited at high water will be exposed and die when the water falls; or if the spawning occurs at a lower water level, the next flood waters will bury the eggs or sweep them away. The suddenness, the violence and the irregularity of the changes in water level of the Rogue are conspicuous in the records of every year.

The spawning grounds lie chiefly at least above the region in which placer mining run-off is poured into the stream so that whatever the effect of this added burden it is not exerted in the spawning period or on the early stages of life of the new generation. Even though natural erosion contributed to the stream burden more material in time long past, and less abundantly and frequently in more recent years, still the fish, young and old, in the higher reaches of the stream held their own and maintained the run under natural conditions. Only when man introduced new barriers, devised new traps in diversion ditches which led away from safety, or discharged waste materials of unknown and destructive type have the fish been unable to cope with the changes of the environment.

QUANTITY OF FISH FOOD PRESENT

My attention was early drawn to the question of the supply of fish food in the Rogue. The low-water season was naturally favorable for the study of this factor as the slow movement of the stream, its numerous shallows and the transparency of the water made it easy to observe the numbers and kinds of aquatic organisms present. I was impressed by the abundance and variety of the aquatic population. Both in the lower river and as far up as Rogue Elk I studied the forms which could be seen in different parts of the stream and recorded in my field notes the frequence with which organisms known to be fish food were met with on the trip. No attempt was made to secure a complete list or to determine precisely the species which were encountered. Such an undertaking would have demanded far more time than had been agreed upon for the study. Speaking generally and in a broad way, I am confident that the food supply of the fish is abundant and well distributed and also adequate to sustain a large run of fish.

One word of caution must be expressed here. No factor is more variable or spotty in my experience than the quantity of food to be seen in traveling along a stream. Conditions vary with every pool. At one moment on a good stream the student may see a veritable crowd of crayfish, insect larvae and smaller organisms and only a few yards away miss entirely some types abundant before, or even look long without seeing much of anything. The conditions of a stream cannot be determined by random sampling at a few places or on a single day. Fisherman's luck affects the student of river conditions also and fish food is as erratic apparently in habits and distribution as are the fish themselves.

Early in October I saw fish in pools where local fishermen were unable to attract them by flies or bait. The temperature of the water was a little higher than usual and the current slower so that the warmer, less oxygenated water may have made the fish logy. It seems possible that the abundant food was so easily caught that bait and lure were less attractive. Certain it is that neither natural nor artificial erosion up to date has exerted any demonstrable change in the fish food supply in the Rogue.

This discussion would not be complete if I omitted to mention certain ecological relations which indicate that the placer mine run-off may be of advantage to the fish. One of these is protection afforded by the turbidity of the water and the other is the suggested increase in the primitive food supply.

That adult fish are screened by the turbid waters is well known and often made the subject of comment by fishermen. In fact, they attribute the difficulty in catching fish to the amount of "waste" discharged by placer mines. I have already discussed the quantity of this discharge and called attention to the rapidity with which it settles. In Table III are given the muddiest water we could find; half the tests were 105 ppm or less, and four were only 30 ppm or less. Yet anyone standing on the bridge at the points where these samples were taken would say the water was too muddy for fishing; and it *was* too dense to see fish in the stream, but really contained very little sediment. This does not deter the fish from getting their own food.

Most significant is a possible relation of fine silt to the food of young fish. It has been shown that the presence of finely divided suspensoids of natural origin may be of advantage to the microbiota which constitutes the foundation element in the food supply of water. Studies on aquatic biology conducted by the Wisconsin Survey demonstrated that colloidal organic particles collect on carbon and sand grains to build a culture medium for aquatic bacteria. The finest suspensoids and colloidal particles in the placer mine run-off would evidently function in this way and increase the supply of aquatic bacteria and other associated micro-organisms. Thus would be multiplied the food supply of protozoa and other types of aquatic life which subsist primarily on bacteria. Among such are young stages or larvae of small crustaceans and insects which form such an important part of the food of young fish at the start of life. It is even possible that colloidal particles encased by bacterial cultures may form an element in the direct food supply of young fish.

I have on many occasions dissected under the microscope very young fish from muddy waters and found to my surprise that the alimentary canal was filled to repletion with what was apparently only mud, even though the fish were healthy and vigorous. Instead of being merely inert material taken in by chance with small organisms floating in the muddy water, this mass may represent particles coated with a layer of zoogloea, or bacterial jelly, that is in itself of nutritive value. But whether under circumstances the fine material may have any positive worth for the growth or nourishment of the fish, I am clear that evidence thus far obtained from many streams, and at many times, shows that such material does not under conditions already outlined do damage to the gills or to the digestive system even of the young fish at the most susceptible period of life.

APPENDIX A

EXTRACTS FROM REPORT ON ROGUE RIVER TURBIDITY

By ARTHUR M. SWARTLEY

Transportation methods. Material is moved by transportation, in suspension and as dissolved matter.

Traction is the method by which the particles, too coarse to be carried in suspension, are moved forward upon the bottom of the stream by sliding, rolling, or in short jumps.

Suspension is that method of stream transportation wherein the small particles are lifted above the bottom for considerable time and distance. The larger particles in suspension are largely dependent upon velocity, the smaller particles are somewhat independent, while colloidal material is almost independent of it.

With lowering of velocity the larger particles in suspension drop to the bottom and become a part of the tractional movement. If the currents proceeded in straightforward movement as in a flume, the suspended particles might soon go to the bottom except those of colloidal size.

Solution material is independent of velocity in its forward movement.

Material in solution and suspension is mostly carried out to sea at once or within a short time, once it reaches the larger tributaries. A minor part of this fine material may be left behind where streams pass through occasional valleys and remain there indefinitely. The bulk of these valley deposits are of the larger particles such as coarse sand, gravel and boulders. The lateral migration of streams and the deepening of their channels may leave benches of gravel well above the flood-water level to remain for ages to be affected only by the slower agencies of erosion, like rain, to transport it to a nearby stream.

These stream beds, benches and valley deposits are of necessity no different than the material that is continually migrating to sea from the narrow canyons and their more rapid flowing streams. The material is derived from the same places but was stopped because the channel widened out and the grade lessened so that the stream was not competent to carry the load. If the erosion is from a mountainous area containing gold, platinum and the other heavy metals, these will be deposited in the valley along with the boulders, gravel and sand, but at best these are only incidental. Their presence there is of interest to the placer miner, but to others it is only of academic interest until such time as placer mining begins and mining debris is being dumped into the stream. It there enters into the problem here being discussed and a more particular description of its nature is pertinent, whether in transit or sidetracked for a time in the valley or on beaches to await removal by the agencies of nature or of man, and the material transported along the bed of the stream whether gravel or sand is essentially no different than the solid rock from which it came. Water flowing over it is as clear as though it were flowing over solid rock. In flood periods it is in slow motion, the deeps being deepened and the shallows being filled and broadened: When the flood recedes the deeps are slowly filling from the shallows. Each flood makes its contribution to its downstream movement. That it does not shallow the pools as the years go by is well known to all observers of the habit of streams. It is composed of small rock fragments and contributes practically nothing to the composition of the water, either chemically or in turbidity. It is chemically inert and has no oxygen demand and therefore takes away from the flowing stream nothing which the fish require. This is equally true of this material whether placed in transit by nature or by man, since they are alike in nature, come from the same places, and are only being accelerated by man in their journey to the sea.

The material carried in suspension varies from fine sand to particles almost infinitely small. Speaking in sizes, the fine sand, which is about the very coarsest material carried in suspension, ranges from a maximum of 1/100 of an inch in diameter down to 1/200 inch; very fine sand 1/200 inch to 1/400 inch; silt 1/400 inch to 1/6400 inch; and clay 1/6400 inch and finer. The coarse sizes of fine sand are now in suspension, now in traction, dependent mainly upon the velocity of the stream under flood conditions.

Along with the above described materials which are merely minerals in a fine state of subdivision, are the colloids. Colloids are the more

finely divided particles altered physically and chemically, usually combined with water, and frequently jelly-like. Material in solution is fully dissolved matter; it is composed of various substances and varies in the different streams, dependent upon the rock found in each watershed, and it contains practically all the elements found in the suspended material, such as silicon, iron, calcium, magnesium, sodium, and potassium combined with oxygen or as carbonates, sulphates, nitrates, and chlorides, plus the decomposition products of vegetation.

It is to be noted that all the materials entering the streams, whether placed there by nature or by man, whether coarse or fine, whether travelling upon the bottom, in suspension or in solution, are almost altogether inert, suffer little change on their way to the sea, and having reached the end point of chemical change have no further need of oxygen, therefore not robbing the water of its oxygen which the fish demand, or adding to the water toxic agents injurious to fish or fish life.

From various sources data on the Rogue River and other streams, not subjected to influence of mining projects, show a range of parts per million and an average turbidity as follows:

	Parts per million	*Average turbidity*
Rogue River at Copper Canyon (estimated)	321	.....
Snake River at Weiser, Idaho	324	80
Owyhee River at Owyhee, Oregon	395	167
Klamath River at Klamath Falls, Oregon	146	.....
Umatilla River at Umatilla, Oregon	247	79
John Day River at McDonald, Oregon	324	245
Columbia River at Cascade Locks, Oregon	137	27
Colorado River (flood conditions)	21,500	.....
Rio Grande	14,840	.....

APPENDIX B

EXPERIMENTS ON TOLERANCE OF YOUNG TROUT AND SALMON FOR SUSPENDED SEDIMENT IN WATER

By Dr. L. E. GRIFFIN, Reed College

The experiments which are described in the following account were undertaken to obtain definite information as to the direct effect of large amounts of soil sediment in water upon the fish inhabiting such water. The Department of Geology and Mineral Industries of the state of Oregon arranged with me for experimental studies on this question. I have been ably assisted in carrying on the studies by Mr. Harry Beckwith of Reed College.

The experiments covered two periods: One of three weeks, the other of four weeks. In the first period the fish tested were cutthroat fingerlings; in the second, young chinook salmon. The fish were kept in troughs, similar to those used in fish hatcheries, in which a depth of five inches of water was maintained. The water was kept flowing by circulation through a centrifugal pump, and aeration was secured by ejection of the water into the troughs in a heavy spray. The pumps used were small, limiting the flow of water to a rate of about one-half mile an hour. The slow streamlike movement of the water along the troughs was sufficient to keep a much heavier load of fine sediment in suspension than is ordinarily found even in muddy streams, but was not rapid enough to keep in suspension all the sediment which was put into the troughs, or to maintain a turbidity of more than 750 parts per million for 24 hours.

The material used for the sediment consisted of soil and alluvial material taken from ten spots around the Esterly mine, near O'Brien, Josephine county, Oregon, which were representative of the alluvial soils of that region. The samples were thoroughly mixed; when material was needed for the tests, the dirt was mixed with water and the portion which settled quickly was rejected. When the remaining fine sediment was placed in the fish troughs it was found that a considerable portion settled out at a regular rate during the first six hours after it was put in, but that after that period the amount of suspended silt remained nearly constant. As the sediment which settled in the troughs was stirred and strained daily, and occasionally fresh soil was added, the water of the experimental trough carried a heavy load of sediment for a few hours of each day and a lighter but constant load for the remainder of the day.

After several preliminary experiments in which apparatus and methods were tested, the first trial run was begun. Two troughs were arranged parallel to each other in a dimly lighted, unheated building. The water with which the troughs were filled came from a spring-fed stream on the Reed College campus, in which trout are living and breeding. One trough contained the sediment-laden water, the other clear water. Aside from the processes needed to keep the sediment in suspension, both troughs and the fish placed in them were treated in the same manner.

December 11, 1937, 90 cutthroat trout fingerlings, 2 to 2½ inches in length, were secured from the federal hatchery at Clackamas, Oregon. Fifty of these were placed in the sediment-containing trough, 40 in the clear-water trough. The experiment continued until December 30. At the time of the daily stirring (at which time fresh sediment was occasionally added) the load of sediment varied from 2,300 to 3,500 parts per million by weight. This was enough to make the water a dark brown color, and so opaque that a hand held an inch under the surface was invisible. The load of sediment fell rapidly during the first hour, and then more slowly, until after the sixth hour an almost constant load was carried for the remainder of a 24-hour period. This constant load varied from day to day from 360 ppm to 600 ppm, being 500 or more ppm on all but six of the 19 days during which the test lasted.

The fish were fed with the same food used in the hatchery from which they came. Those in the clear water usually did not feed until the operator had backed away from the trough. In the muddy water the fish were not seen to feed for the first two days, but after that they rose to the surface and fed actively as soon as particles of food began to fall on the surface of the water. The trout in the clear water remained nervous throughout the experimental period, while those in the muddy water became bold enough to peck at the operator's hand when it was placed in the water. Because of

the necessity of scraping the bottom of the trough, stirring up the silt, and adding fresh soil, fish in the sediment trough were disturbed much more than those in the clear water.

When the test was ended on December 30, it was found that a much larger proportion of the fish in the sediment-containing trough had survived (56%) than in the clear-water trough (10%). There was no noticeable difference in the color of the surviving fish in the two troughs, and the fish which had lived in the muddy water were as large as the survivors from the clear-water trough.

On January 12, 1938, a second experiment was begun in which 150 chinook salmon fingerlings, 1¾ to 2 inches long, were divided equally between the two troughs. This time the sediment was placed in the trough which had contained clear water in the previous experiment, and the other trough was used for clear water. Care was taken to reduce all movements near the troughs to those absolutely necessary to conduct the test. During the period of this test, which lasted 28 days, until February 9, the load of sediment was greater than in the first test. The maximum load at the time of stirring was from 3,100 to 6,500 ppm on most days. The constant load after the sixth hour was from 300 to 480 ppm from January 12 to January 25; and from 650 to 750 ppm from January 26 to February 9, except on two days when the load fell to 380 and 410 ppm.

The salmon fingerlings in the clear water at first showed the same nervousness as the trout, but after a week those which survived were not easily disturbed and fed avidly. The young salmon were not seen to feed in the muddy water quite so quickly as the young trout, and when they were seen they took food more deliberately than the trout. After the fish became accustomed to the new conditions of their lives and to the movements of the operator, those in both troughs fed satisfactorily.

Most of the salmon fingerlings in the muddy water were considerably lighter in color than the controls at the close of the test, though a few had not changed color. The fish of the muddy water were also irregular in growth, some having grown as much as the controls, while some were noticeably smaller.

At the close of the 28-day experimental period, 88% of the fish kept in the muddy water were alive, while 36% of the controls lived. Most of the controls which died did so during the first three days of the test; after which time there is no significant difference in the death rate of the two lots of fish.

On examining the day-by-day record one is struck by the heavy mortality which occurred on the third day of both experiments among the fish kept in the clear-water trough. This was not due to special conditions in one of the troughs, because the troughs were reversed for the two experiments. It could not be determined whether the fish kept in clear water were more active than those in the muddy water trough because the latter were invisible most of the time. The fact that more of the fish in clear water jumped over the ends of their trough indicates that they were more nervous. It was evident also that the fish in clear water were more disturbed by movements of the observers, changes of light intensity, etc., than the other fish.

In the second experiment the electric lights in the dimly illuminated aquarium room were not turned on, so that disturbance was avoided; but it was necessary to scrape the bottoms of the troughs, adjust screens and strainers, and perform other necessary actions daily. All these disturbed the fish in clear water much more than those in the muddy water. When excited, the fish frequently darted against the sides of their trough with considerable force. On several occasions startled fish were seen to strike the side of the trough with sufficient speed to stun themselves. It seems possible that the high mortality of the fish in clear water during the first week of both experiments was due to the injuries they inflicted upon themselves when excited. After a few days the fish became accustomed to their living conditions and to the movements of the operator in and around their trough, and then were excited much less easily.

After the first week the mortality among the young trout of the first experiment was almost the same in both troughs; 13 in the muddy water, 11 in the clear water. As the cutthroat trout fed well and grew normally in the muddy water, the conditions there do not seem to have been unfavorable for these fish.

After the first week of the second experiment, with young salmon for subjects, 9 died in the muddy water trough and 2 in the clear water. But after the heavy loss discussed above only 29 remained alive in clear water and 74 in muddy water, so that the difference in mortality is relatively about the same.

The results of the experiments indicate that young trout and salmon are not directly injured by

living for considerable periods of time in water which carries so much soil sediment that it is made extremely muddy and opaque. They also indicate that cutthroat trout and salmon fingerlings can feed and grow apparently well in very muddy water.

The sediment load of the water in these experiments was continuously much greater than it is in the ordinary muddy stream. Water taken from the Willamette River at flood stage after three days of heavy winter rains, and when the river water appeared to be extremely turbid, contained only 42 ppm of sediments.

While the results of these experiments throw some light on the problems which were under consideration, it seems desirable that more extensive tests should be undertaken, in order to secure a larger accumulation of data, and to investigate factors which could not be studied in the limited time or with the apparatus available for these experiments.

EXPERIMENT I

Cutthroat Fingerlings

Date	Water Temperature	Sediment Stirred	Sample Taken	Parts per Million	Tank 1 with Sediment		Tank 2 with Clear Water	
					Dead	Living	Dead	Living
Dec.	*F.*							
11	62.6	5:00 pm	6:00 pm	840	0	50	0	40
12	62.6	9:00 am	10:00 am	760	0	50	0	40
13	62.6	9:00 am	9:30 am	1190	1	49	12	28
			4:00 pm	520	0	49	0	28
14	62.6	.....	.....	.....	2	47	3	25
15	62.6	9:00 am	9:30 am	1140	0	47	0	25
			4:00 pm	690	3	44	8	17
16	62.6	9:00 am	9:30 am	1130	0	44	0	17
			4:00 pm	390	3	41	2	15
17		No	record		0	41	0	15
18	62.6	9:00 am	9:30 am	990	0	41	0	15
			4:00 pm	480	5	36	* 5	10
19	62.6	9:00 am	9:30 am	1040	1	35	1	9
20	62.6	9:00 am	9:30 am	990	0	35	0	9
			4:00 pm	500	0	35	† 1	8
21	60.8	9:00 am	9:30 am	750	1	34	0	8
22	60.8	9:00 am	4:00 pm	560	‡ 4	30	0	8
23	58.0	.....	.....	.....	0	30	0	8
24	57.2	.....	.....	.....	1	29	1	7
25	58.0	.....	.....	.....	1	28	0	7
26	58.0	.....	.....	.....	0	28	2	5
27	58.0	.....	.....	.....	0	28	0	5
28	58.0	.....	.....	.....	0	28	1	4
29	58.0	.....	.....	.....	0	28	0	4
30	58.0	.....	.....	.....	0	28	0	4
				Totals	22	28	36	4

Circumstances made weighing impossible from December 23 to December 30; conditions of the troughs were kept the same as they had been.

* Two of these jumped over the end screen and were carried through the pump.

† Killed by the pump.

‡ One killed by the pump.

EXPERIMENT II

Chinook Salmon Fingerlings

Date	Water Temperature	Sediment Stirred	Sample Taken	Parts per Million	Tank 1 with Sediment		Tank 2 with Clear Water	
					Dead	Living	Dead	Living
Jan.	*F.*							
12	58.0	†	.....	.....	0	75	0	75
13	58.0	.....	.....	.....	0	75	1	74
14	58.0	.....	.....	.....	0	75	* 40	34
15	58.0	.....	.....	.....	1	74	5	29
16	58.0	.....	.....	.....	0	74	0	29
17	58.0	9:00 am	9:30 am	820	0	74	0	29
18	58.0	9:00 am	9:30 am	950	0	74	0	29
19	58.0	.....	.....	.....	0	74	0	29
20	58.0	9:00 am	9:30 am	960	0	74	0	29
21	58.0	9:00 am	9:30 am	1100	0	74	0	29
22	58.0	9:00 am	9:30 am	1350	0	74	0	29
23	58.0	3:00 pm	3:30 pm	1240	0	74	0	29
24	58.0	3:00 pm	3:30 pm	1600	1	73	1	28
25	57.2	.....	.....	.....	1	72	0	28
26	57.2	3:00 pm	3:30 pm	2130	1	71	0	28
27	55.4	11:30 am	4:00 pm	930	0	71	0	28
28	55.4	9:00 am	9:30 am	2050	0	71	0	28
29	55.4	9:00 am	9:30 am	1670	0	71	0	28
30	53.6	9:00 am	9:30 am	1520	0	71	0	28
31	53.6	9:00 am	9:30 am	2120	0	71	0	28
Feb.								
1	53.6	11:30 am	4:00 pm	850	2	69	0	28
2	53.6	9:00 am	9:30 am	1480	0	69	0	28
3	53.6	9:00 am	9:30 am	1060	1	68	0	28
4	55.4	.....	.....	.....	0	68	0	28
5	60.8	6:00 am	6:30 am	2317	3	65	0	28
			12:30 pm	841	0	65	0	28
			8:00 pm	770	0	65	0	28
6	60.8	.....	.....	.....	0	65	1	27
7	60.8	6:00 am	6:30 am	2150	0	65	0	27
			12:30 pm	780	0	65	0	27
			8:00 pm	760	0	65	0	27
8	60.8	.....	.....	.....	0	65	0	27
9	60.8	4:00 pm	4:01 pm	5960	0	65	0	27
				Totals	10	65	48	27

From January 12 to 16 silt was added to the sediment trough daily in order to build up the load of suspended matter to a maximum. The load of suspended material was somewhat greater than during the first experiment.

* Four of these jumped over the screen at the outlet and were killed in the pump; six leaped over the side at the inlet end, which was not covered by mosquito netting as was the rest of the trough.

† Fish put in trough.

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Fresno DFG SEIR

11/16/09

Submitted by

R.C.M. Enterprises

850 San Jose Ave #110

Clovis, Ca 93612

Questions

1 Why are Mineral Resources not included in the CEQA study?

2 Why is the Environmentalist study so biased against property owners?

3 Why are the benefits of dredging not included in the study material?

4 If questions are to be directed at material in the study, where do we put the positive effects of dredging?

Page. 28 *& 29

Notice of Preparation / Initial Study

Project No. 09.005

The environmental factors checked below would potentially be affected by this project

(i.e., the project would involve at least one impact that is a "Potentially Significant Impact"), as indicated by the check list on the following pages.

CHECK LIST

Aesthetics (checked)

Air Quality (checked)

Biological Resources (checked)

Cultural Resources (checked)

Hazards and Hazardous Materials (checked)

Hydrology/Water Quality (checked)

Noise (checked)

Recreation (checked)

Mandatory Findings of Significance (checked)

Mineral Resources (NOT CHECKED)

Signed, John McCamman, Chief Deputy Director 10/26/09

The Chief Deputy Director of CDFG has made a knowingly deliberate and false official written statement, by not checking the "Mineral Resources" checklist box in this official CEQA initial study report. It is significant in several aspects.

It is common knowledge that gold, platinum and other associated extremely valuable minerals are Mineral Resources.

It is common knowledge that these valuable mineral resources certainly exist as placer deposits, within waterways throughout California.

It is common knowledge and utterly indisputable that "suction dredging" is a widespread modern, efficient small scale mining method throughout California. Clearly, that is what triggered this CEQA study.

It is common Knowledge that small scale suction dredging is usually profitable. Otherwise, no prudent person would invest in a suction dredge or spend time performing the intense labor to do it.

It is common knowledge that relatively significant amounts of gold and other valuable minerals are recovered by small scale suction dredging annually in California.

Given this indisputable series of facts. It is not possible or reality, that the Chief Deputy Director of CDFG, the very state agency that regulates all suction dredge permitting statewide, could assert that small scale "suction dredging" does not involve, nor have significant impact on "Mineral Resources" within California.

The reason the box is unchecked would be because it involves CEQA and SMARA provisions.

Given that provisions of CEQA mandate SMARA application in a CEQA project, if "Mineral Resources" are involved. Another set of governing standards must be included within this CEQA process, otherwise it is fundamentally flawed from the onset , and any result or determination made within it is illegitimate and contrary to law.

Obviously, CDFG must have an Attorney Generals legal opinion to clarify how they can proceed. Once they have written notice, or accept verbal or written comment regarding SMARA and facts pointed out here. They cannot deny actual or constructive notice of it. And cannot proceed without inclusion of SMARA.

3.3.15 Mineral Resources

Introduction

The purpose of the Mineral Resources section is to identify and evaluate the potential for the project to adversely affect the availability of known mineral resources. The mineral resources of concern include metals, industrial minerals (e.g., aggregate, sand and gravel), oil and gas, and geothermal resources that would be of value to the region and residents of the State.

Responsible Agencies

The protection of mineral resources in California is the responsibility of the following agencies, which either have statutory authority or are Responsible Agencies under CEQA:

- *California Department of Conservation* http://www.consrv.ca.gov is the primary agency with regard to mineral resource protection. The Department is charged with conserving earth resources (*Public Resources Code Sections 600-690*) http://www.leginfo.ca.gov and has five program divisions that address mineral resource issues: *Division of Mines and Geology*, http://www.consrv.ca.gov/dmg *Division of Oil, Gas and Geothermal Resources*, http://www.consrv.ca.gov/dog/ *Division of Land Resource Protection*, http://www.consrv.ca.gov/dlrp *Division of Recycling*, http://www.consrv.ca.gov/dor/ and *Office of Mine Reclamation* http://www.consrv.ca.gov/omr.

- *State Mining and Geology Board*, which develops policy direction regarding the development and conservation of mineral resources and reclamation of mined lands. http://www.consrv.ca.gov/smgb/

Other State agencies with Statutory Authority or that may wish to comment on the environmental document with regard to mineral resources issues include:

- State Lands Commission

- Coastal Commission (for land uses that could affect access to mineral resources within the Coastal Zone). (See *UC CEQA Handbook Section 3.3.14.*)

- State Water Resources Control Board (as pertains to mineral resource water quality-related issues),

- Parks and Recreation, Fish and Game, and Energy Commission (*CEQA Guidelines Appendix B*),

See *UC CEQA Handbook Section 3.3.14,* Land Use, for a description of the responsibilities of the State Lands Commission and California Coastal Commission with regard to project or land uses.

LRDP EIR

- The mineral resources impact analysis should focus on the potential loss of availability of the mineral resource due to land use conversions.

Loss of access to mineral resources would primarily be the result of conversion of lands underlain by these resources to other uses, or within close proximity to the resources, such that the construction and occupancy of the project would restrict or eliminate safe and environmentally sound measures to implement extractive operations. Loss of access could also be the result of changes in land ownership (e.g., non-renewal of a lease where active mining is occurring).

Loss of access to mineral resources for the purposes of future extraction could be considered to be primarily an economic issue. According to *CEQA Guidelines Section 15131(a)* http://ceres.ca.gov/topic/env_law/ceqa/guidelines/art9.html purely economic impacts are not considered physical environmental impacts. Notwithstanding, important mineral resource areas are recognized at the federal and State levels through environmental resource management plans and adopted mineral resource mapping, and at the local level through land use planning documents such as general plans that incorporate such information. Therefore, the potential loss of such resources, if any, due to project implementation should be described. If mineral resources could be affected, an assessment of cumulative impacts should also be included.

Potential effects related to land use compatibility (if the project would site new uses adjacent to existing mining operations) are more appropriately discussed in the land use section of the LRDP EIR. If active mining activities were restricted or eliminated by changes in land ownership, it might be necessary to expand or open a mine in another area, which could have significant environmental effects on other natural resources. Such issues should be discussed in the appropriate technical sections of the LRDP EIR.

Project EIR

To the extent not analyzed in an LRDP EIR, the Mineral Resources section of a Project EIR or the IS should analyze whether the project would result in any effects that were not anticipated or evaluated by the LRDP EIR. Further, it should analyze the project in relation to the current LRDP and any existing land use plans.

Standards of Significance

Would the project:

- Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?

- Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

- Exceed an applicable LRDP or program EIR standard of significance? This question enables the campus to define a campus specific standard of significance.

Analytical Methods

- The environmental analysis must evaluate site-specific characteristics in relation to the type and extent of proposed changes in land use.

- The Mineral Resources section of the EIR or Tiered Initial Study should identify the locations of mineral resources relative to the project site.

Sections 2761(a) and (b) and 2790 of the State's *Surface Mining and Reclamation Act (SMARA)* provide for a mineral lands inventory process termed classification-designation. The California Division of Mines and Geology, and the State Mining and Geology Board http://www.consrv.ca.gov/smgb/ are responsible for administering this process and have statutory authority. Areas are classified on the basis of geologic factors, without regard to existing land use and land ownership. The areas are categorized into four Mineral Resource Zones (MRZs). Of the four categories, lands classified as MRZ-2 are of the greatest importance. Such areas are underlain by demonstrated mineral resources where geologic data indicate significant measured or indicated resources are present. MRZ-2 areas designated by the Mining and Geology Board as "regionally significant" are incorporated by regulation into Title 14, Division 2 of the California Code of Regulations. Such designations require that a lead agency's land use decisions involving designated areas be made in accordance with its mineral resource management policies, and that it consider the importance of the mineral resource to the region or the state as a whole, not just to the lead agency's jurisdiction.

The primary source of information considered in the analysis is the "mineral lands classification" maps published by the State pursuant to SMARA, as described above. Reports containing these maps are listed in *Publications Available from the Division of Mines and Geology.* http://www.consrv.ca.gov/dmg Digital data is currently available for some locations and may be obtained by contacting the Division of Mines and Geology. Locations of areas classified MRZ-2 on the classification maps and their proximity to project development should be depicted graphically and described in the text, based on information provided in the published report. If mineral lands classification mapping has not been published, that should be noted. In lieu of such information, the local general plan or applicable environmental plan should be consulted to determine whether any mineral resource land use designations have been adopted, or if there are other land use or zoning designations that allow for mineral extraction. Finally, two comprehensive databases managed by the U.S. Geological Survey (*Minerals Availability System* and *Mineral Resource Data System*) http://www.mrdata.usgs.gov contain substantial amounts of information regarding specific mineral locations. However, interpretation of the data and its relevance to the mineral resources analysis in the EIR or Tiered Initial Study (TIS) should be limited to a general discussion and should not be used solely to determine potential effects.

Local general plans are required to incorporate the above-mentioned information where MRZ-2 classifications or regionally significant designations have been published. Although the University of

California is constitutionally exempt from local land use planning requirements, information contained in the local plans is valuable, and should be considered.

The data listed above may be assumed to reasonably indicate the potential for resources of local or regional significance. Consultation with the local land use jurisdiction regarding active and pending mining permits and status of reclamation plans may also provide useful information, along with review of the most current edition of *Mines and Mineral Producers Active in California*, Division of Mines and Geology Special Publication 103. If such information is available, mineral rights, patents, and claims should also be identified.

Once information has been gathered from the above-mentioned sources as to the existence of valuable mineral resources, the determination must be made as to whether the project would affect them.

Generally Feasible Mitigation Measures

- Avoid siting project land uses in areas classified MRZ-2 or designated as "regionally significant" by the State Geologist where feasible.

- Where MRZ-2 or "regionally significant" areas have not been identified, avoid siting project land uses in mineral resource areas formally identified in local general plans, specific plans, or relevant environmental plans, or where site-specific information evaluated by a geologist registered in the State of California suggests the potential for a mineral deposit of economic value as feasible.

- Consult with local planning jurisdictions prior to adopting any land use change that could restrict or eliminate mineral deposits identified as MRZ-2, regionally significant, or identified by the local land use jurisdiction, or that would interfere with active mining operations. The purpose of this consultation is to identify potential land use conflicts and to cooperate with the local jurisdiction so that it can fulfill its obligations under the Public Resources Code and SMARA.

From: <lyra@srrc.org>
To: <dfgsuctiondredge@dfg.ca.gov>
Date: 12/3/2009 4:53 PM
Subject: SRRC comments for Suction Dredge Permitting and SEIR
Attachments: SRRC Comments on Suction Dredge EIR.doc

Mark -
Please find the Salmon River Restoration Council's comments attached,

Thank you,

Lyra Cressey
Salmon River Restoration Council
(530) 462-4665

Salmon River Restoration Council

PO Box 1089 ♦ 25631 Sawyers Bar Rd ♦ Sawyers Bar, CA 96027
Email: info@srrc.org ♦ webpage: www.srrc.org
Phone: (530) 462-4665 ♦ fax: (530)462-4664

November 3, 2009

Mark Stopher
California Department of Fish and Game
601 Locust Street
Redding, CA 96001

Subject: Initial Study for Suction Dredge Permitting Program and Subsequent Environmental Impact Report

To: California Department of Fish and Game
From: Salmon River Restoration Council

Dear Mr. Stopher,

Thank you for this opportunity to comment on the Initial Study for Suction Dredge Permitting and SEIR. The Salmon River is a uniquely unimpaired watershed and provides excellent habitat for fish and other aquatic life. Poorly regulated suction dredge activities have a negative impact on this important resource.

The Salmon River has numerous statutory protections for fisheries and water quality including:

- Clean Water Act 303(d) listing for temperature impairment
- National and California Wild and Scenic designations for the Mainstem Salmon River, Wooley Creek, and almost all of the North Fork and South Fork Salmon River. Outstandingly remarkable and extraordinary values include fisheries and water quality.
- Key Watershed designation in Aquatic Conservation Strategy in Northwest Forest Plan of 1994

Activities permitted by the Suction Dredge Permitting Program and the Program itself must be in compliance with these laws and designations. Any suction dredging permitted cannot contribute to further impairment of temperature (including effects of turbidity on temperature), cannot negatively impact Wild and Scenic values, and must not interfere with the goals of the Aquatic Conservation Strategy.

Deleterious Effects

CDFG is authorized to permit suction dredge mining only if it is shown not to have a "deleterious effect" on fish. This should require a thorough examination of every mining operation prior to issuance of a permit. Simply issuing a ministerial permit that allows dredging without first specifically determining whether the mining is deleterious to fish is not legal.

The Department claims to use a "common sense plain" definition of deleterious. The definition given is, "…deleterious effect generally means a wide-ranging or long-lasting consequence for a fish population that extends beyond the temporal or special context of a specific direct impact. Such deleterious effects could include the following: (1) Catch, capture, kill, or injure a species listed as candidate, threatened or endangered under the state or federal Endangered Species Act; (2) A substantial reduction in the range of any species, and/or extirpation of a population; (3) A fundamental change to the structure of a community or stream ecosystem, including substantial reductions in biodiversity or resiliency to disturbance, resulting in the reasonably foreseeable consequence of (1) or (2) above."[1]

Merriam-Webster on the other hand, defines deleterious as "harmful often in a subtle or unexpected way". This should be used as the "common sense plain" definition and should be the baseline against which the effects of suction dredging will be judged. There is no basis for tying the definition of deleterious to the Endangered Species Act. The effects of dredging can be deleterious without a species being listed under the ESA. For instance, on the Salmon River, we have the last run of wild spring Chinook in the Klamath Basin, which is a remnant repository of important fish genetics, but which has no official ESA designation. Under this definition of deleterious, effects of suction dredging on Salmon River spring Chinook would not even be considered in issuing permits.

Thermal Refugia

Thermal refugia are critical for the day to day survival of multiple species of fish including, coho, juvenile spring and fall Chinook, adult spring Chinook, summer and winter steelhead, and rainbow trout, during the same time period in which suction dredging takes place on the Salmon River (July-September). Suction dredging in or near thermal refugia (deep pools, mouths of streams, springs) may interfere with the ability of fish to utilize these critical areas for their survival and directly affect the health or mortality of these fish. On the Salmon River, a number of popular mining club claims that receive a higher than average degree of use, are located in or near thermal refugia. The Department needs to thoroughly analyze the potential impacts to these critical areas and consider appropriate regulation to allow unimpaired fish access and use of thermal refugia in the Salmon River.

Camping and Land Use

Unlike most areas, the Salmon River is not equipped to handle the ancillary impacts of some recreational activities. Suction dredgers camp for weeks or months at a time on the Salmon River, where there are no septic or sewage facilities. The SRRC has documented cases of improper disposal of human waste at dredgers camps, such as in plastic bags on river bars. The Department needs to address these ancillary suction dredge impacts, including the increased likelihood of their occurrence in remote areas like the Salmon River.

Transport of Invasive Species

Consideration needs to be given to the potential transport of both aquatic and terrestrial invasive species (such as New Zealand mussels, mud snails, algae, noxious weeds, etc) into remote areas by suction dredges. Currently dredge equipment is allowed to be transported throughout the state with no requirements avoiding the spread of invasive species. The Salmon River is currently relatively un-impacted by invasives, and has a healthy native fauna and flora. A concerted effort is being made on the part of the community and land managers to control harmful invasive species on the Salmon. The Department needs to make sure that every measure is taken to prevent their spread.

If you have any questions or additional needs from us, please do not hesitate to contact us. We look forward to continuing to work with CDFG to make the Salmon River a better place for water quality, the fish, the people and for all beneficial uses.

Sincerely,

Lyra Cressey
Water Monitoring Program Coordinator

From: Peter Brucker <ptb92day@gmail.com>
To: <dfgsuctiondredge@dfg.ca.gov>
Date: 12/3/2009 4:54 PM
Subject: SRRC Scoping Comment for the Suction Dredge Permitting Program EIR
Attachments: ATT.1.Overview of the SRRC. Community Restoration Program. 1992-2009. doc.doc; ATT.2. Klamath River Basin Spring-run Chinook.Map of Historic and Current Range.zip

Abstract

From: Petey Brucker, President

Salmon River Restoration Council,

PO Box 1089,

Sawyers Bar, CA
96027

To: Mark Stopher
California Department of Fish and Game (CDFG)
601 Locust Street
Redding, CA 96001
RE: SRRC Scoping Comments to the CDFG for the Suction Dredge Permitting Program EIR

Date: December 3, 2009

Dear Mr. Stopher,

The Salmon River Restoration Council (SRRC) appreciates this opportunity to provide comments to you regarding the suction dredge scoping program EIR currently under way. The SRRC is a community based 501- c- 3 non-profit corporation. The mission of the Salmon River Restoration Council is to assess, protect, restore and maintain the Salmon River ecosystems with the active participation of the local community, focusing on restoration of the anadromous fisheries resources and the development of a sustainable economy. We provide assistance and education to the general public and cooperating agencies by facilitating communication and cooperation between the local communities, managing agencies, Native American Tribes, and other stakeholders.

A key focus of the SRRC is to protect and restore the anadromous fish species of the Salmon River, which include: Coho salmon, spring and fall run Chinook salmon, summer and winter run Steelhead, Pacific Lamprey, Green Sturgeon and other native species. In particular the Salmon River is noted as having one of the last runs of native spring-run Chinook in the Klamath River Basin. The SRRC has been extensively involved in protecting and restoring the spring-run Chinook in the Salmon River. We have subsequently found it necessary to lend similar attention to the entire run of spring-run Chinook in the Klamath River Basin, as recovery of this keystone emblematic species necessitates a meta population approach. Spring-run Chinook are currently at a high risk of extinction.

The SRRC has been an active partner in the development and implementation of the Salmon River Subbasin Restoration Strategy (Strategy) completed by the SRRC and US Forest Service- Klamath National Forest in 2002 and adopted as the TMDL implementation Plan by the North Coast Regional Water Quality Control Board in 2005. Through the SRRC's Salmon River Community Restoration Program, the SRRC has made various contributions to watershed and fisheries resource restoration in the Salmon River and larger Klamath River Basin (See Attachment # 1 - Salmon River Community Restoration Program Overview). The SRRC has been actively engaged with the local suction dredge gold mining community, providing educational materials on the protection and restoration of the above mentioned anadromous fish species.

We are providing you, below, with some background information that we have compiled regarding the status and unique life history of the spring-run Chinook stocks of the Salmon River. To be used in the development of the Department's new regulations for suction dredge gold mining on the Salmon River and for the larger Klamath River Basin. In this background information, provided below, we have also provided some perspective and data for the larger Klamath River Basin run of these fish.

Background on the Status of the Klamath River Basin Spring Chinook salmon, highlighting the Salmon River Stock

Spring-run Chinook salmon (*Oncorhynchus tshawytscha*) were once the dominant run type in the Klamath/Trinity Basin, Spring run populations are at less than 10% of their historic level. At least 7 runs (in the Klamath Basin) are now extinct (NOAA Fisheries –Chinook Status Review 1998). Spring-run Chinook in the Klamath Basin currently utilize an estimated 3 % of their historical habitat (See Attachment # 2- Map of Historic and Current Range of Klamath River Basin spring-run Chinook). Several of these historic stocks proliferated above the dams on the Klamath, Trinity and Shasta rivers. The near extirpation of Spring Chinook in the Klamath River basin indicates potential future problems for other anadromous stocks that rely on freshwater habitats during the juvenile and adult life histories (Salmon, Steelhead, and Trout in California-*Status *of* an Emblematic Fauna, *Moyle 2008).

As shown in Attachment #2 –Historic and Current Range Map, spring-run Chinook species were once found throughout the Klamath Basin. However, passage of spring-run Chinook into their historical range was blocked below Klamath Falls in 1895 by construction of Copco 1 Dam, and on the Shasta River with the construction of Dwinell Dam (Hamilton et al. 2005, Moyle 2008). The large run in the Shasta River disappeared coincidentally with the construction of Dwinnell Dam in 1926 (Moyle et al. 1995). Historically, they were especially abundant in the major tributary basins of the Klamath and Trinity Rivers, such as the Salmon, Scott, Shasta, South Fork and North Fork Trinity Rivers. Due to a legacy of human impacts (i.e. dams, mining, logging, and overfishing), today, only the Salmon River and its two forks maintain a viable population (Moyle 2008).

Both Coho and spring Chinook salmon demonstrate a stream-type life history strategy, where juveniles remain at least a year in freshwater before entering the ocean (Healey 1991), and therefore require coldwater-river conditions like those found in the coldwater system of the Salmon River. Spring run Chinook are distinct from fall run Chinook in that adult spring Chinook enter fresh water in spring and early summer, before their gonads are fully developed and hold in cold water areas for 2-4 months before spawning. Successful juvenile life history strategies require suitable winter rearing habitats, commonly found in off-channel reaches, wetlands and estuary environments.

By the 1980s, spring-run Chinook had been largely eliminated from much of their former habitats because the cold, clear water and deep pools that they require were either absent or inaccessible. Within the Lower Klamath watershed, the Salmon River remains the most pristine tributary (Moyle 2004). Spring Chinook require deep pools for summer holding adults, such as those in the Salmon River.

In the Klamath River drainage above the Trinity, only the (Spring Chinook) population in the Salmon River and Wooley Creek remains; it has annual runs of 150-1500 fish (Campbell and Moyle 1991, Barnhart 1994). Numbers of fish in the area continue to decline (Moyle 2002) with only 90 returning adults counted in the 2005 cooperative snorkel surveys on the Salmon River (ATTACHMENT # 3 - Salmon River Spring Chinook Census Data). Approximately 177 km of habitat is accessible to spring Chinook in the Salmon River (West 1991) with a large portion being underutilized or unsuitable. Spring run Chinook are listed by the US Forest Service as a Sensitive Species in the Klamath National Forest. Reconnecting historic habitats in the Klamath and its tributaries is necessary for long term persistence of these fish (Moyle 2008).

In addition, we are sending you attached files, which are 3 zipped files

that have 1individual file. These are submitted as part of our scoping comments. We have attached one unsipped and one zipped file folder to this email. We are sending you 2 subsequent zip files in 2 subsequent emails. We have done this, as these files may be too large to be sent in one email. These ATTACHMENTS 1,2,3,4 - A and B, 5, AND 6 are included for you to use in the development of the new regulation in the CDFG Suction Dredge Permitting Program. The emphasis of the data and information that we are providing to you is primarily related to the anadromous fisheries species of the Salmon River, highlighting spring-run Chinook, as they are unique to the Salmon River and should receive specific measures to adeqautely protect them. The files attached include: 1) ATTACHMENT # 1 – Salmon River Community Restoration Program Overview; 2) ATTACHMENT # 2 – Klamath River Basin Spring-run Chinook Map of Historic and Current Range; 3) ATTACHMENT # 3 - Salmon
River Adult Spring Chinook Survey Data 1980-2009; 4)ATTACHMENTS # 4 – A)Salmon River spring Chinook fry report [2].pdf and B) Salmon River Spring Chinook Otolith Report Draft.doc; 5) ATTACHMENT # 5 – Salmon River Spring-run Chinook Adult Spawning Survey Map; and 6) ATTACHMENT # 6 – Periodicity with Hardy, which identifies various life history of fish species in the Klamath River Basin.

Through the development and use of fisheries and watershed planning documents, the SRRC and its partners have and will continue to work closely with the Department to develop and implement actions to assist in our understanding of the Salmon River fisheries resources and to help guide the protection and recovery of these fish species, emphasizing the Spring-run Chinook.

We request that new suction dredge gold mining regulations have adequate measures in them to protect spring-run Chinook and the critical habitat needed for the recovery of this sensitive species in the Salmon River and Klamath River Basin. In addition, the new regulation should also provide adequate protection measures for the other native species of fish found in the Salmon River, as well as for the aquatic ecosystem in general.

We are available to assist the Department, as is needed and appropriate, in any additional research and data collection activities on the Salmon River related to the development of the Department's new regulations for suction dredge gold mining in the Salmon River and the Klamath River Basin

We look forward to assisting you in the development of the Department's regulations for suction dredge gold mining. Please let us know if you have any question for us or would like additional information, related to the conditions and needs in the Salmon River or other areas related to the aquatic ecosystem of the Klamath River Basin, including the Trinity River tributary.

Respectfully,

Petey Brucker – President

Overview of the Salmon River Restoration Council's
Salmon River Community Restoration Program (CRP) 1992-2009

The Salmon River Restoration Council (SRRC) was formed in 1992 and was provided support by the Klamath Basin Fisheries Task Force between 1993 - 2006. The SRRC has served as the lead entity in the Salmon River subbasin in the effort to enlist cooperation amongst the stakeholders to create a watershed restoration program, highlighting the anadromous fisheries resources. The SRRC's efforts were spawned by a successful Poaching Prevention Program, which was embraced by the local community starting in 1992, and highlighted the protection of spring-run Chinook and summer steelhead. The SRRC, through its educational approach, has been recognized as reducing the poaching of these species in the Salmon River by over 90%.

The SRRC initiated the Community Restoration Program (CRP) in 1993. Through the CRP, the SRRC has planned and sponsored an annual series of ecosystem awareness workshops to increase stakeholder awareness for the Salmon River conditions and needs. These workshops are often accompanied by volunteer workdays, which provide the opportunity for stakeholders to apply learned restoration techniques needed to promote salmonid species recovery. Through the CRP, the SRRC has held over 1,000 scheduled workshops and/or workdays that have involved over 100,000 hours of in-kind contribution, largely from the local community members. Since 1993, the SRRC has administered over $5,000,000 in fisheries/wateshed restoration activities in the Salmon River, with almost $ 2 million provided by the SRRC as in-kind contribution.

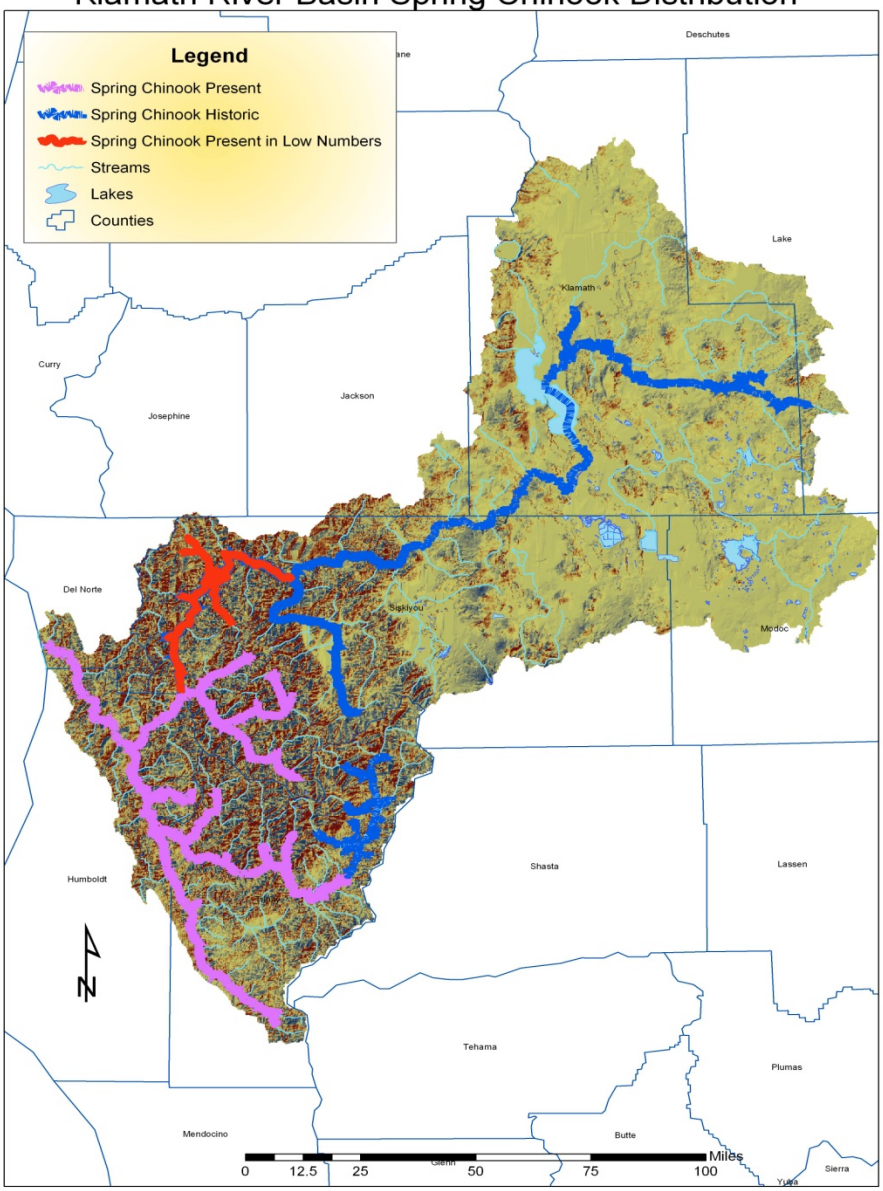
In 1994 the SRRC adopted its first annual Work Plan for the Community Restoration Program, which created an overview of conditions and needs for anadromous fisheries in the Salmon River and identified projects for the community to address these needs. The annually updated and adopted CRP Plan has helped to guide efforts for the community to help address factors that limit Salmon River salmonids.

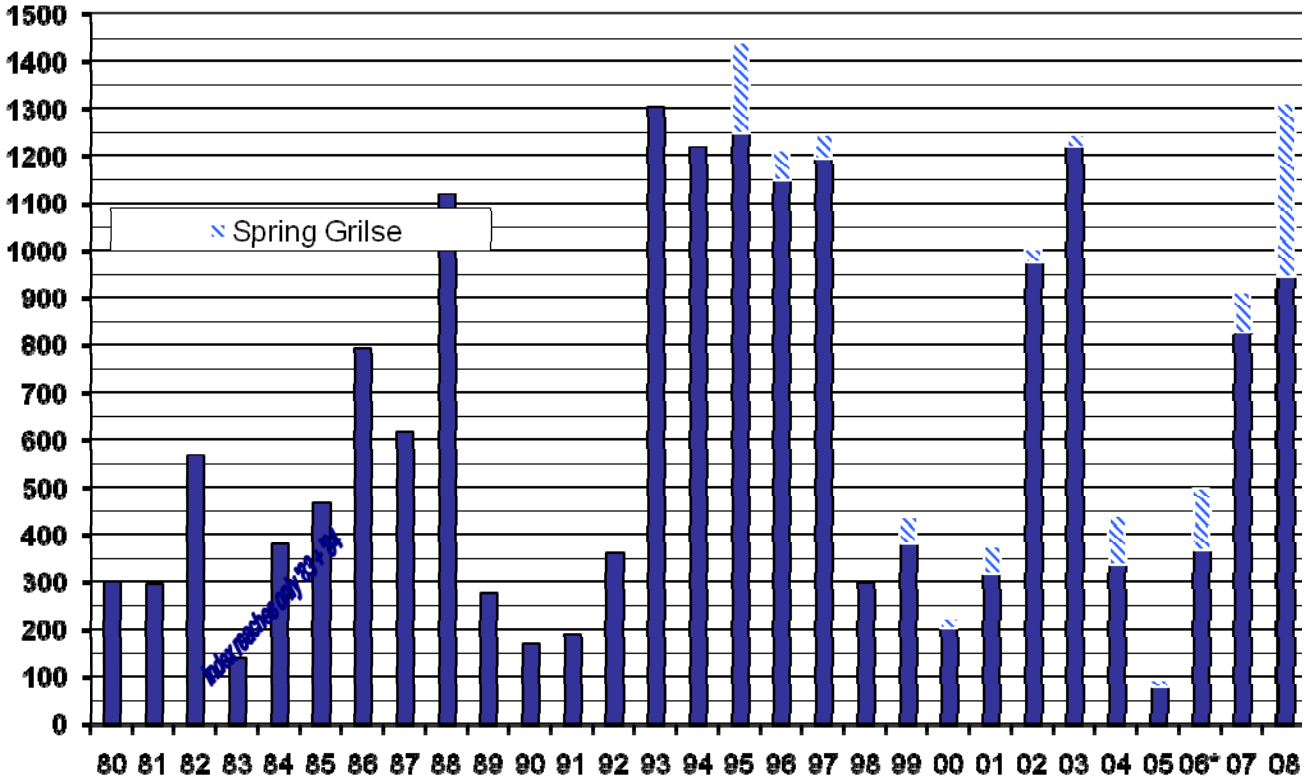
In 2002 the SRRC and the US Forest Service completed the Salmon River Subbasin Restoration Strategy (Strategy), which assessed the anadromous fisheries resource conditions for the Salmon River and developed an "Action Matrix" to best address the limiting factors for the existing species. The SRRC and its partners utilize this Strategy, which incorporates the CRP Plan, and tiers to the Klamath and Six Rivers Land and Resource Management Plans, adopted by the US Forest Service in 2005. The SRRC assisted in the North Coast Regional Quality Control Board's (Board) TMDL process for water temperature in the Salmon River. This assessment was completed in 2005. The Board adopted the Strategy as the Salmon River TMDL Implementation Plan.

The SRRC and its partners have utilized the Strategy to guide prioritized watershed restoration and fisheries protection in the Salmon River. To address

the multiple needs of salmonids, the SRRC has created nine Programs to help focus cooperator attention on specific areas. Each year the Program Coordinators develop annual work plans that are used to coordinate with our cooperators. The Program Areas include: Fisheries Monitoring and Management; Watershed Monitoring; Watershed Education; Roads Management; Fire, Fuels, and Forestry; Invasive Species Control; Riparian Habitat Assessment and Restoration; River-Clean Up; and Maintaining the Watershed Center.

Klamath River Basin Spring Chinook Distribution





Salmon River Spring Chinook Population Totals 1980-2008
*06 Estimation due to inability to survey 35% the river because of wildfires

2009 Results: Adult Spring Chinook = 527; Spring Chinook Jacks/Grilse = 116;
TOTAL – 643 returning adults for 2009

From: Peter Brucker <ptb92day@gmail.com>
To: <dfgsuctiondredge@dfg.ca.gov>
Date: 12/3/2009 5:09 PM
Subject: SRRC Suction Dredge Permit Program EIR - 2nd Installment of Zipped Files
Attachments: ATT.5.Salmon River Spring run Chinook REDD data..03-06.zip; ATT.4.A.SalmonRiverspringChinookfryreport[2].zip

Mark,

Here is the SRRC's 2nd installment of zipped files.

Petey Brucker - SRRC President

From: Peter Brucker <ptb92day@gmail.com>
To: <dfgsuctiondredge@dfg.ca.gov>
Date: 12/3/2009 5:28 PM
Subject: SRRC Suction Dredge Permit Program EIR - 3rd Installment of Zipped Files
Attachments: ATT.4.B.SalmonRiverspringChinookfryreport[2] (2).zip

Abstract

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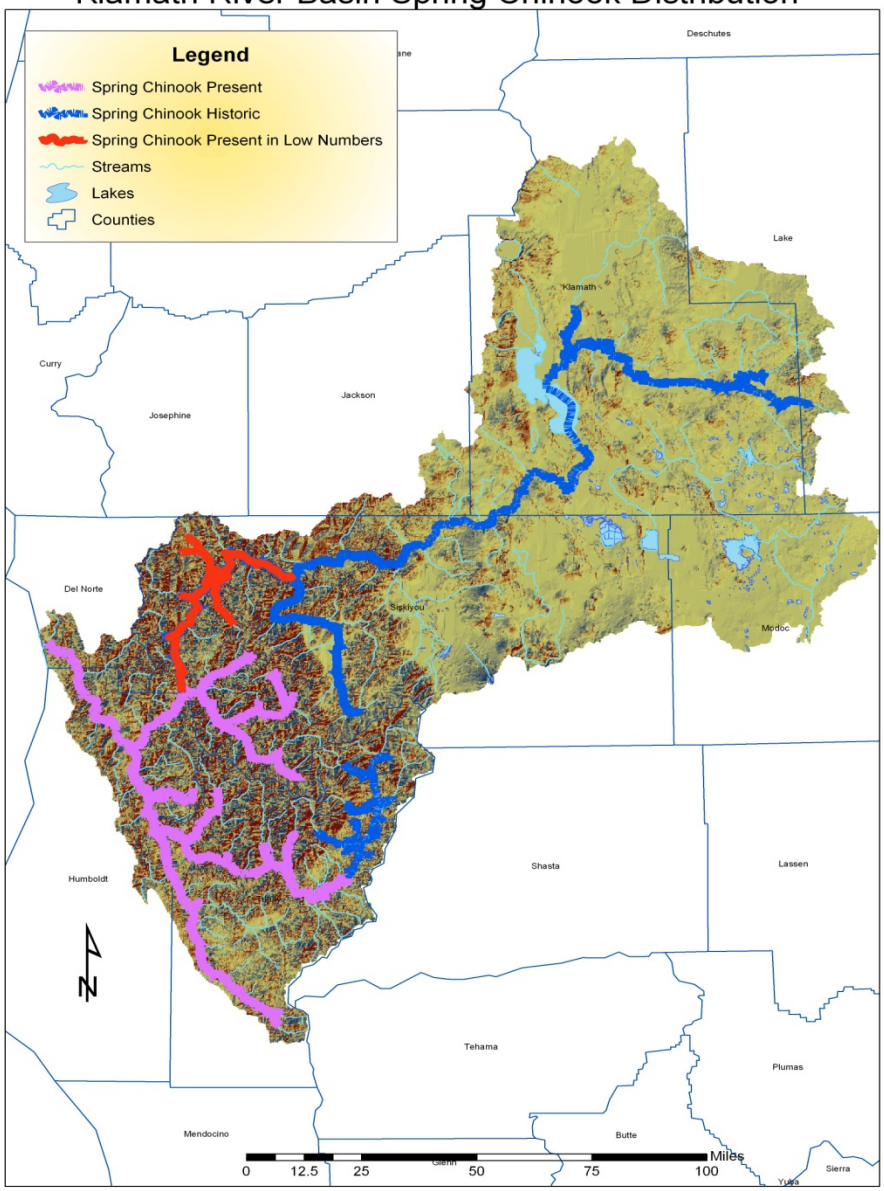

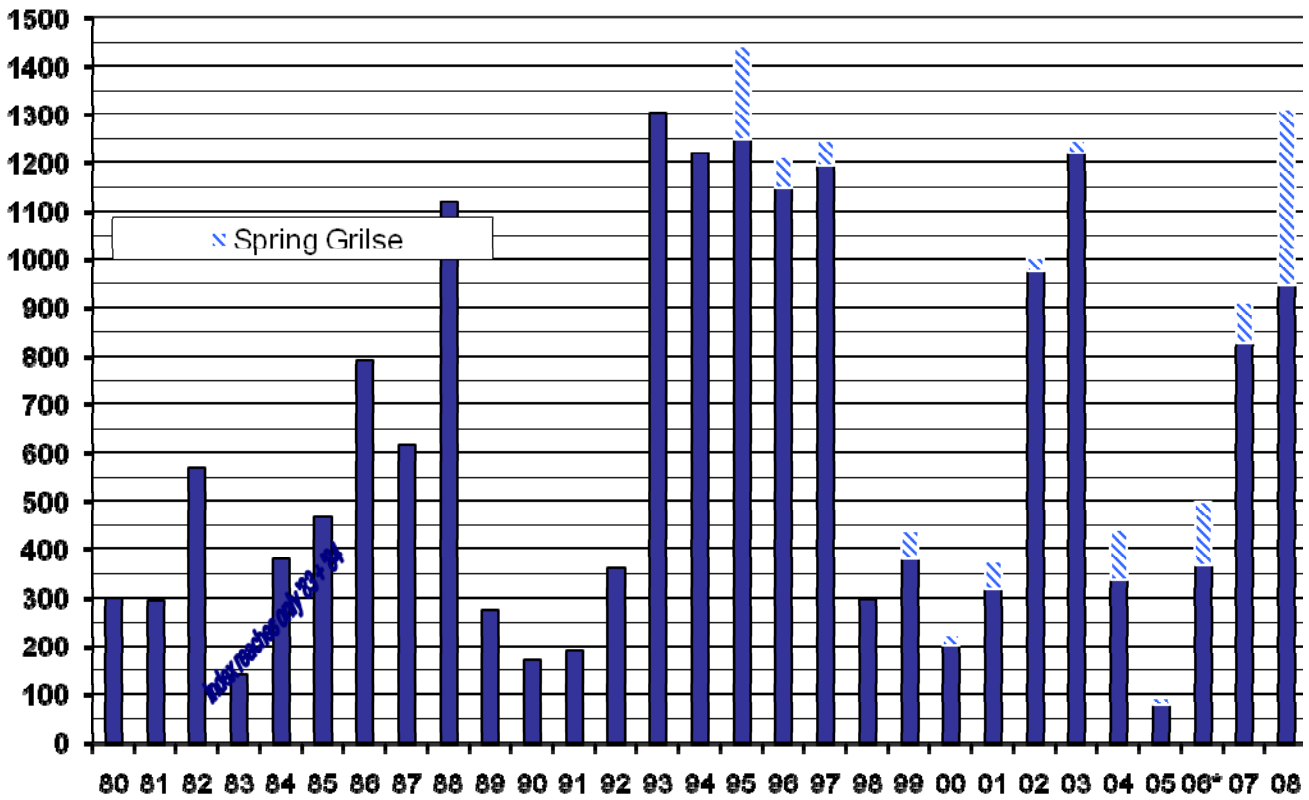

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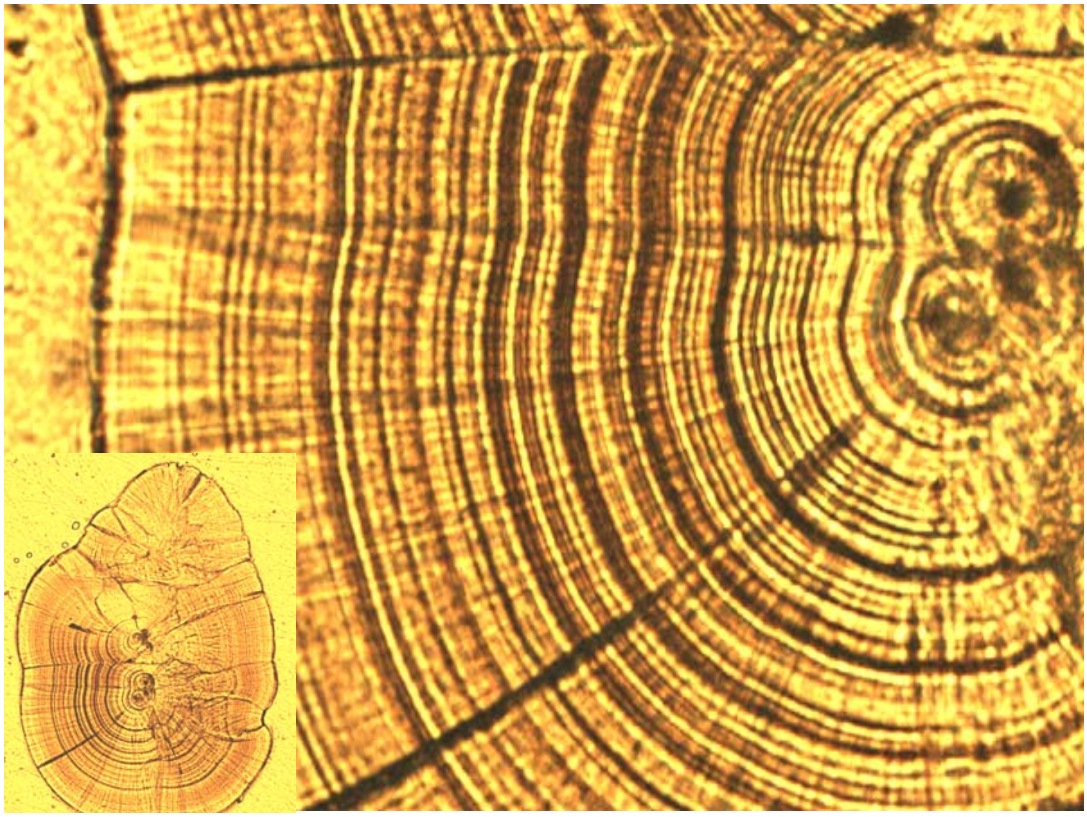
Arcata Fisheries Technical Report AFWO-TR01-05

Microstructural Natal Signature of Spring Chinook Salmon Otoliths from the Salmon River Drainage, Northern California



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March 2005

Funding for this study was provided by the Klamath River Basin Conservation Area Restoration Program (Klamath Fishery Restoration Program).

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Key words: Otolith, microstructure, Salmon River, natal signature, spring Chinook salmon

The correct citation for this report is:

Sartori, Jane C. 2005. Microstructural natal signature of spring Chinook salmon otoliths from the Salmon River drainage, northern California. U. S. Fish and Wildlife Service, Arcata Fish and Wildlife Office, Arcata Fisheries Technical Report Number AFWO-TR01-05, Arcata, California.

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Microstructural Natal Signature of Spring Chinook Salmon Otoliths from the Salmon River Drainage, Northern California

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Abstract. Early life history events in juvenile salmonid development, including eye-up, hatch, emergence, and habitat transitioning, can be linked to otolith microstructural patterns. In recent years, the combination of early life history events and incubation thermal regime has been used to associate stocks with specific incubation sites. Variation in temperature and growth can produce otolith increment patterns that are stock specific, provided the stock incubated under a distinct thermal regime. The resulting otolith increment pattern may be specific to the thermal regime under which embryonic and alevin development occurred, as it is generally accepted that increment deposition occurs prior to hatch. In this study, otoliths were collected from spring Chinook salmon (*Oncorhynchus tshawytscha*) fry captured from spawning sites on the North and South forks of the Salmon River in northwestern California in spring 2004. Otolith microstructure was analyzed using light microscopy and imaging software and later compared between the two forks and to other samples collected previously in the Klamath Basin. A natal microstructural signature was present on all otoliths collected in the Salmon River Basin (n=91) that was distinctive from other Klamath Basin collections. Natal signatures of fish collected from the North and South forks of the Salmon River were similar, indicating that both sample sites may have comparable thermal regimes during the incubation and intragravel development period for spring Chinook salmon.

Introduction

Otolith microstructure analysis has been used to determine age and growth of individual fish for many years. Recently, otolith microstructural patterns have been used to identify different juvenile life history types or life history events (e.g. Neilson et al. 1985; Larsen and Reisenbichler 1993, Volk et al. 1995) and to differentiate stocks in a system (e.g. Paragamian et al. 1992, Rieman and Myers 1994, Quinn et al. 1999). Transitions in life history such as “eye-up”, hatch, emergence, and migration from one habitat to another (e.g. freshwater to saltwater) are recorded in microstructural patterns of otoliths. These

changes appear as variations in increment deposition on otoliths that alter appearance of the microstructural pattern (Marshall and Parker 1982; Campana and Neilson 1985; Volk et al. 1990, 1996).

Fish otoliths are comprised primarily of calcium carbonate in aragonite mineral form embedded in a collagen-like organic matrix (Degens et al. 1969). Organic and inorganic components of otoliths interact during otolith growth to lay down a series of dark and light bands that reflect the bipartite nature of otolith increments. Incremental patterns may be comprised of a few to many individual increments that reflect previously mentioned life history events or changes in environment such as temperature or salinity.

Variation in temperature and growth can produce otolith increment patterns that are stock specific, provided the stock incubated under a distinctive thermal regime (Zhang et al. 1995, Volk et al. 1996, Quinn et al. 1999). The resulting increment pattern is specific to the thermal regime under which embryonic and alevin development occurred as it is generally accepted that increment deposition initiates prior to hatching (Quinn et al. 1999). The portion of the incremental pattern that exemplifies natal origin is located near the core of the otolith and represents intragravel residency. In this study, the core region of otoliths is referenced as the "developmental check region", encompassing the area between and including the hatch and emergence checkmarks.

The primary objective of this study was to identify a developmental check region and associated microstructural pattern of newly emerged spring Chinook salmon (*Oncorhynchus tshawytscha*) from the North and South forks of the Salmon River through qualitative and quantitative means. Identification of this region and its associated incremental pattern should reflect a natal signature of collection sites. A secondary objective, dependent on the ability to identify a developmental check pattern (objective 1), was to compare the developmental check patterns from samples collected from the North and South forks of the Salmon River to each other; as well as to visually compare the patterns to other recognized patterns.

Study Area

Otoliths were collected from spawning sites on the North and South forks of the Salmon River, located in the Salmon River watershed of the Klamath River Basin in northwestern California (Figure 1). Sample sites were chosen based on knowledge of spring Chinook spawning exclusivity above the two forks of Salmon River (Peter Brucker, Salmon River Restoration Council, personal communication). Sample sites were similar in elevation and hydrology. Spring run Chinook salmon spawn from about mid-September to late October above the forks of the Salmon River (Table 1), whereas fall run Chinook salmon spawn later in the year in the mainstem Salmon River below the forks. Spring Chinook salmon fry incubate and emerge from redds in January to May (Table 1). Otoliths were collected from fish captured directly below Idlewild Campground (elevation ~783 m) on the North Fork Salmon River and about 1.6 km below Blind Horse Creek (elevation ~823 m) on South Fork Salmon River (Figure 1).

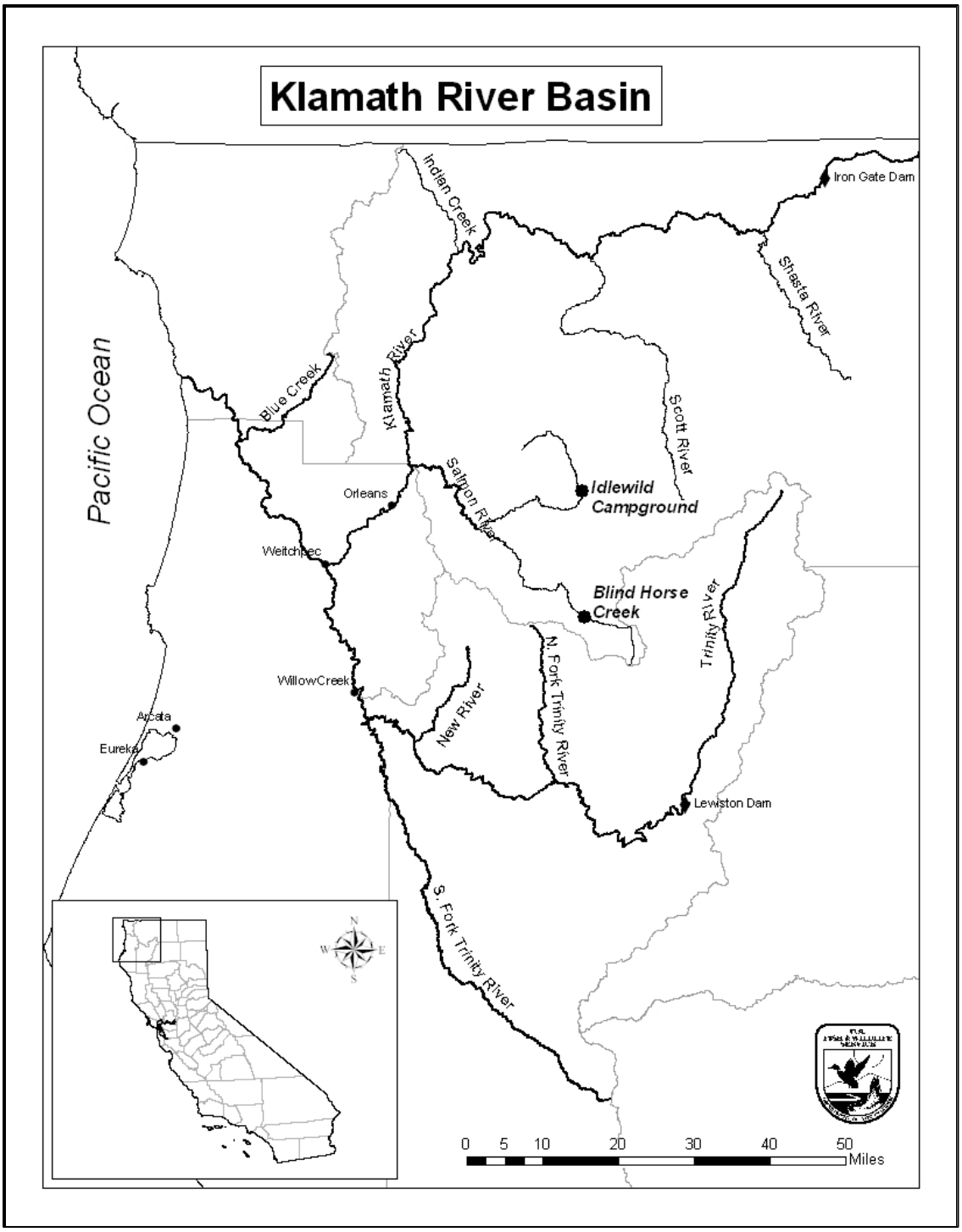


Figure 1. Map of Salmon River showing collection sites.

Table 1. Salmon River Chinook salmon early life stage periodicity (courtesy of Karuk Tribal Fisheries Program).

		Month											
Life Stage	Run	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Redd construction	Spr									X	X		
	Fall										X	X	
Egg incubation and fry emergence	Spr	X	X	X	X	X							
	Fall	X	X	X	X	X							
Fry rearing (up to 50mm)	Spr				X	X	X	X					
	Fall				X	X	X	X					

Methods

Spring Chinook salmon fry were captured from Idlewild Campground and Blind Horse Creek spawning areas using an 18.5 x 14.5 cm dipnet having a mesh size of about 1 mm. A targeted sample size of about 70 spring Chinook salmon fry from each fork of Salmon River was established prior to field collection. Sample size was based on three criteria: (1) type of study (i.e. lethal or non-lethal), (2) life stage of the fish, (3) adequate numbers to establish variance and reliability, and (4) experience of researcher (UFR Committee 2004). Fish fork lengths were measured to nearest millimeter (mm) before fish were frozen prior to laboratory preparation. Otoliths were removed, prepared, and analyzed in the Otolith Laboratory of the Arcata Fish and Wildlife Office in Arcata, California. Otoliths were extracted, cleaned of membranous tissue, and allowed to dry before length (nearest 0.1mm) and weight (nearest 0.00001g) were measured. Extracted otoliths were then embedded in a resin block that was lapped on both sides until the primordial region of the otolith core was exposed. This procedure allowed the pre-and post-hatch area incremental patterns to be viewed by light microscopy.

Prepared samples were visually examined for incremental patterns and “checkmarks” in the region between the core and edge of the otolith. A particular checkmark associated with hatching was noted. ‘Hatch checkmarks’ of salmonids usually appear in the form of a very dark band or structural discontinuity from previous increments. An ‘emergence checkmark’ occurs prior to a transitional area from broad or indistinct increments of the post-hatch alevin to the well-defined daily incremental banding of emergent fry (Volk et al. 1995). For the purpose of this study, a developmental check was defined as a region of increments located between a hatch check and an emergence check, including the two checks. The natal signature was defined as the increments located between the otolith core to the end of the developmental check region since increment deposition in this region occur during intragravel development.

Descriptions of visually examined incremental patterns of specific otolith regions were noted and recorded for each sample. Analyzed otolith regions included the following areas: (1) core to beginning of developmental check, (2) developmental check, and (3) end of developmental check to otolith edge. These areas are referred to as 'regions' for the purpose of this study. All samples were visually analyzed twice with a lapse of three weeks between analyses to avoid reader bias as the same reader conducted both analyses.

Quantitative analyses of otolith regions were completed using light microscopy, an image analysis software system, and a statistical software package. Linear distances of radii (core to specific checkmarks and to otolith edge), incremental widths, and distances between specific checks (hatch and emergence) were measured, recorded, and entered into a database.

Determination of significant difference between developmental check regions of the North and South forks of Salmon River was established using an independent *t*-test (Murphy and Willis 1996), as shown by the equation:

$$t = \left(\bar{y}_1 - \bar{y}_2\right)\sqrt{\frac{n_1 n_2}{n_1 + n_2}} \Big/ \sqrt{\frac{\left(n_1 - 1\right)s_1^{\,2} + \left(n_2 - 1\right)s_2^{\,2}}{n_1 + n_2 - 2}}$$

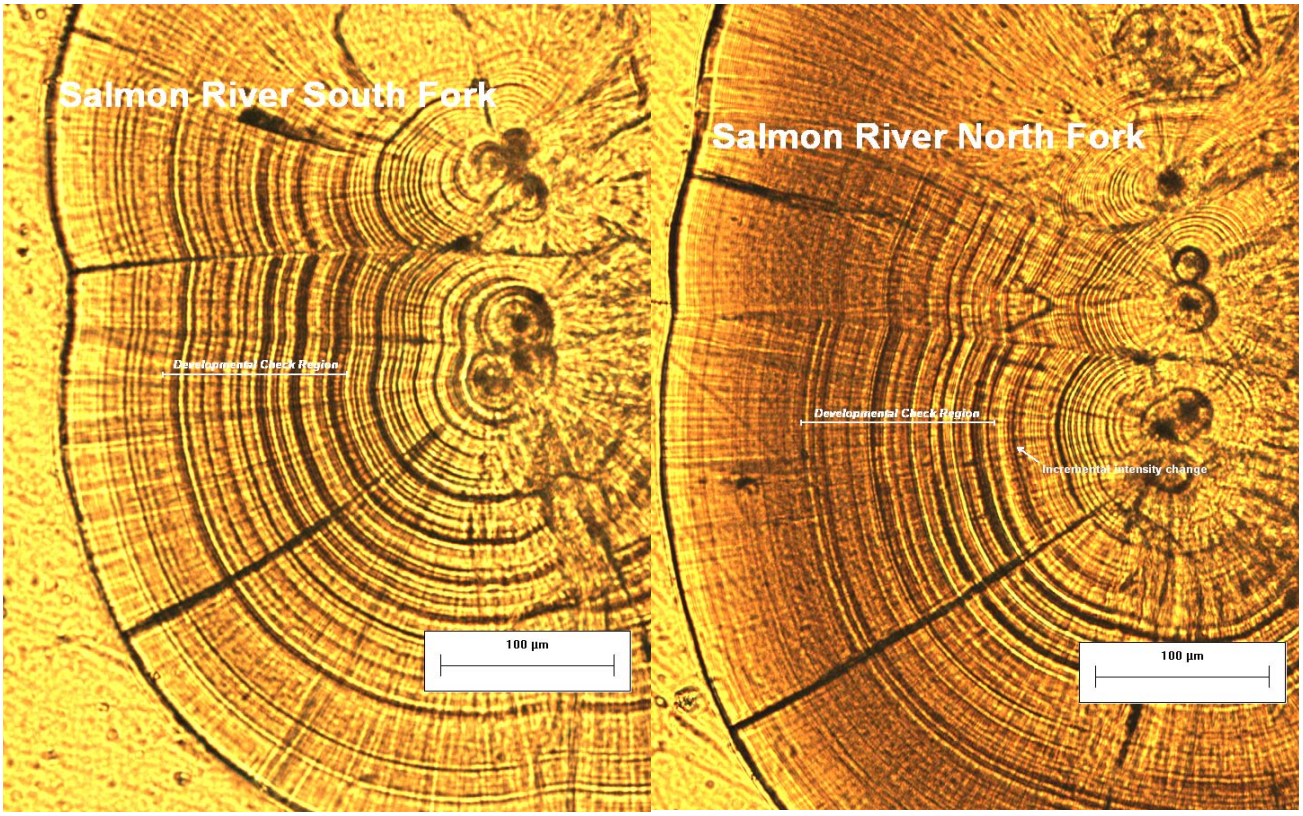
Where t = Test of significant difference between two sample means, $\bar{y}$ = sample means, s^2 = sample variances, and n = sample sizes.

Results

Collection of spring Chinook salmon fry at Idlewild Campground (North Fork) was completed on two separate dates because sampling on the first date of March 25, 2004, resulted in a total of five samples. A second visit to the campground on April 6 yielded 28 additional samples. Collection of fish near Blind Horse Creek on the South Fork of the Salmon River yielded 74 samples on March 5, 2004. Mean fork lengths of North Fork and South Fork samples were 36.3 and 35.8 mm, respectively (Appendix A).

Of the 107 samples collected (North Fork=33, South Fork=74), only 91 samples (North Fork=28, South Fork=63) were used in the visual and quantitative analysis. Sixteen samples were not used due to one or more of the following circumstances: unacceptable radial angle, abnormal crystalline formation on otolith, uneven microstructural growth patterns along radial angle, loss of otolith (part or whole), and/or poor sample preparation.

Visual analysis of North Fork and South Fork samples resulted in a consistently identifiable developmental check pattern located in the same region of the otoliths. Both sample groups exhibited a developmental check pattern that began with a hatch check composed of two dark bands separated by one light band and ending with an emergence check composed of three dark bands separated by two light bands (Figure 2). These distinctive increment pattern segments of the developmental check were apparent for all samples, even as deposition of increments varied in color intensity (Figure 3). The only subtle difference observed was a color intensity change of a few increments (about 2-4) in the area directly preceding the hatch checkmark sequence on the North Fork samples (Figure 2). This small number of increments did not appear larger or smaller in width



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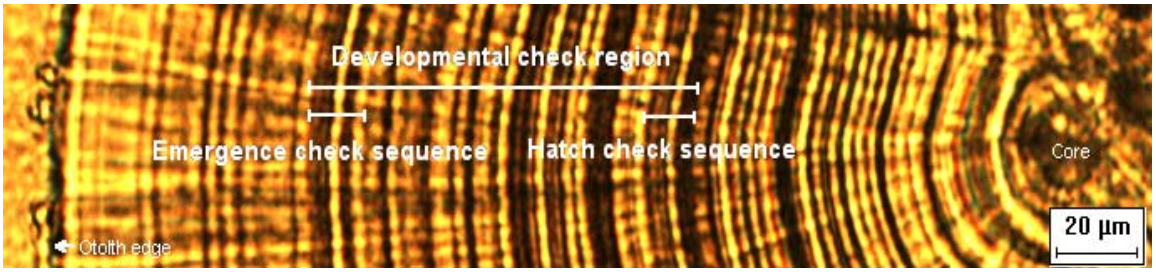

Figure 3. Developmental check sequence on an otolith extracted from a spring Chinook salmon fry collected in the Salmon River drainage in the Klamath River Basin, northwestern California in 2004.

from other increments prior to the change of intensity and did not yield a transitional appearance of increments beyond this point as would a hatch check.

Based on this subtle visual differentiation of the North Fork Salmon River samples and the South Fork Salmon River samples, a blind examination of 30 mixed samples was conducted. This test resulted in 26 samples or 86% correctly identified to associated collection site (Appendix B).

The developmental check width and linear distance from the core region did not differ significantly (p=0.7 and 0.1 at $\alpha = 0.05$, respectively) between the two sample groups

Table 2. Summary of a two sample t-test ($\alpha = 0.05$. df=89) comparing mean linear widths of specific otolith regions between spring Chinook salmon collected on the North and South forks of the Salmon River in 2004.

		Core to Developmental Check Region					Developmental Check Region					Post Developmental Check Region				
Site	n	Mean (µm)	SD (µm)	SE (µm)	t value	p value	Mean (µm)	SD (µm)	SE (µm)	t value	p value	Mean (µm)	SD (µm)	SE (µm)	t value	p value
North Fork	28	98.8	15.5	2.9			88.6	1.7	0.3			72.1	11.6	2.2		
					-1.6	0.1				-0.4	0.7				11.1	0.0
South Fork	63	103.2	10.4	1.3			88.7	1.4	0.2			44.0	11.0	1.4		

(Table 2). Mean widths of the developmental check region for the North Fork Salmon River samples (mean =88.6, s=1.7, n=28) and the South Fork Salmon River samples (mean =88.7, s=1.4, n=63) were similar (t=-0.4, df=89, p=0.7) (Table 2). Mean distance of developmental check from core area for North Fork Salmon River samples (mean =98.8, s=15.5, n=28) and the South Fork Salmon River samples (mean =103.2, s=10.4, n=63) were also similar (t=-1.6, df=89, p=0.1) (Appendix C). The developmental check region contained similar increment counts with a mean of 27 increments (s=1.9, n=28) for the North Fork Salmon River group and a mean of 28 increments (s=2.0, n=63) for the South Fork Salmon River group (t=-1.4, df=89, p=0.2) (Table 3) (Figure 4).

Mean width of post-developmental check area for North Fork Salmon River samples (mean=72.06, s=11.59, n=28) and South Fork Salmon River samples (mean=43.99, s=10.98, n=63) were found to be significantly different (t=11.06, df=89, p<0.001) (Table 2). This difference is a direct result of the number of increments within this region for each sample group. Spring Chinook salmon fry from the North Fork had an average of 18 increments post emergence, which differed significantly from South Fork samples that had an average of 29 increments for the same region (t=11.13, df=89, p<0.001) (Table 3).

Table 3. Summary of a two sample t-test ($\alpha = 0.05$. df=89) comparing mean increment counts of specific otolith regions between spring Chinook salmon collected on the North and South forks of the Salmon River in 2004.

		Core to Developmental Check Region					Developmental Check Region					Post Developmental Check Region				
Site	n	Mean	SD	SE	t value	p value	Mean	SD	SE	t value	p value	Mean	SD	SE	t value	p value
North Fork	28	15	3.5	0.7			27	1.9	0.4			29	4.4	0.8		
					-2.7	0.0				-1.4	0.2				11.1	0.0
South Fork	63	17	2.5	0.3			28	2.0	0.3			18	4.2	0.5		

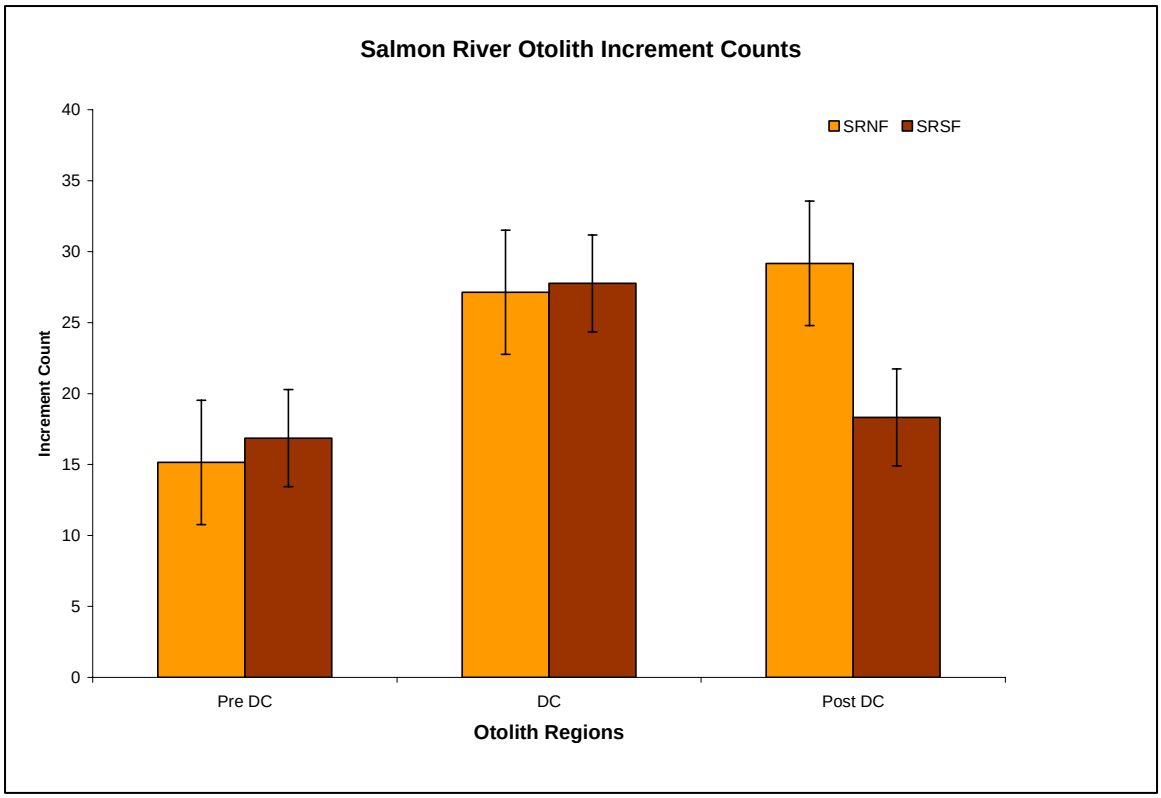

Figure 4. Mean incremental counts of otolith regions from spring Chinook salmon fry collected from North (SRNF) and South (SRSF) forks of the Salmon River in 2004. Vertical lines represent standard error at 95% confidence interval (DC = developmental check).

Discussion

Otoliths collected from Salmon River spring Chinook salmon fry exhibited a particular pattern of contrasting variation in incremental definition of the pre- and post-hatch regions regardless of sampling site. This particular increment pattern was consistently apparent even when sample quality was flawed indicating similar incubational thermal regimes between the Salmon River sampling sites.

Visual examination of otoliths from the North and South forks of the Salmon River indicated that spring Chinook salmon fry incubated under similar thermal regimes. Both groups exhibited the same hatch check incremental sequence and the same emergence check incremental sequence with some variation of increment deposition between the two checks. The only visual difference between the two groups was that the North Fork samples had a few increments that appeared visibly darker prior to the developmental check region than the South Fork samples. Unfortunately, overwintering water temperature data were not available; only temperatures at the time of the collections were recorded by field crews. Water temperature at North Fork sample site was 8°C on April 6, 2004, and 9°C at the South Fork sample site on March 5, 2004. Although a blind test on this subtle difference yielded an 86% correct pattern: site identification ratio, the test was

time consuming, even when conducted by a proficient reader and should be performed with care. If time and/or reader experience is a concern, genetic analyses may provide a more efficient means to assess stock origin, assuming spring Chinook salmon in the North and South forks of the Salmon River differ genetically.

Comparative visual analysis of the Salmon River developmental checkmark was distinct from microstructural patterns associated with Chinook salmon from the Iron Gate hatchery, Trinity River hatchery, and samples collected from the upper Trinity River mainstem (Figures 5-7). This visual difference suggests that the developmental thermal regimes varied between collection sites.

Linear measurements across the developmental check pattern and distance of the developmental check region from the core area did not differ between the North and South forks of the Salmon River. However, there was a significant difference ($p<0.001$) in the width of the post-emergence region of otoliths between the two streams. The mean width of the post-emergence region from otoliths collected on the North Fork was 72.06 µm compared to 43.99 µm for the South Fork samples. As expected, a larger area encompasses a greater number of increments. This is important as teleost fish otoliths deposit increments with a daily periodicity (Campana 1992). More increments beyond the emergence check constitutes more post-emergent days at liberty. The North Fork Salmon River group contained an average of 29 increments within this region, whereas the South Fork Salmon River group contained an average of 18 increments within this region (Figure4). Date of collection appears to support the theory of increment depositional rate

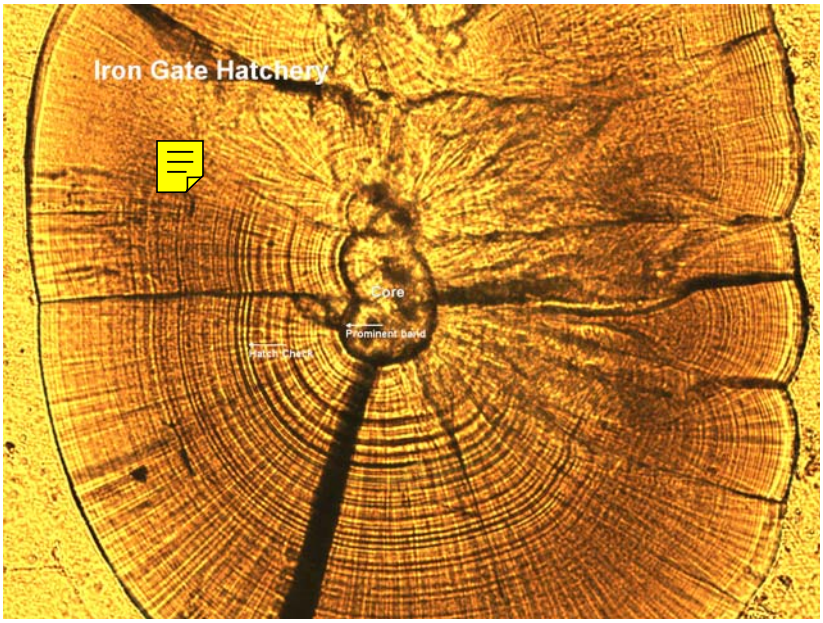

Figure 5. Photograph of otolith microstructural pattern representative of fall Chinook Salmon from Iron Gate Hatchery located in Siskiyou County, California. Note the prominent band surrounding the core region which differentiates this particular pattern from other Klamath Basin patterns sampled thus far.

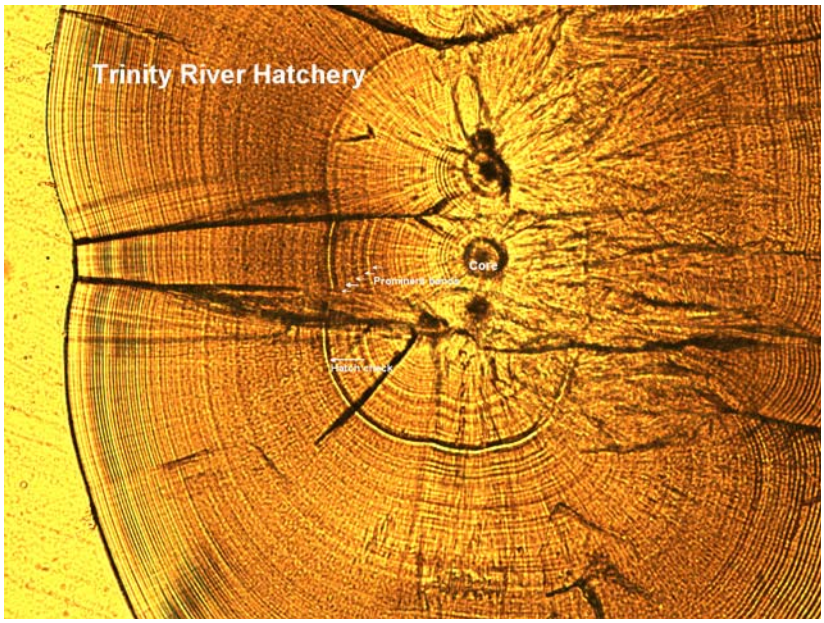

Figure 6. Photograph of otolith microstructural pattern representative of fall Chinook salmon from the Trinity River Hatchery located in Trinity County, California. Note the five prominent bands occurring prior to hatch check. This banding pattern differentiates this particular pattern from other Klamath Basin patterns sampled thus far.

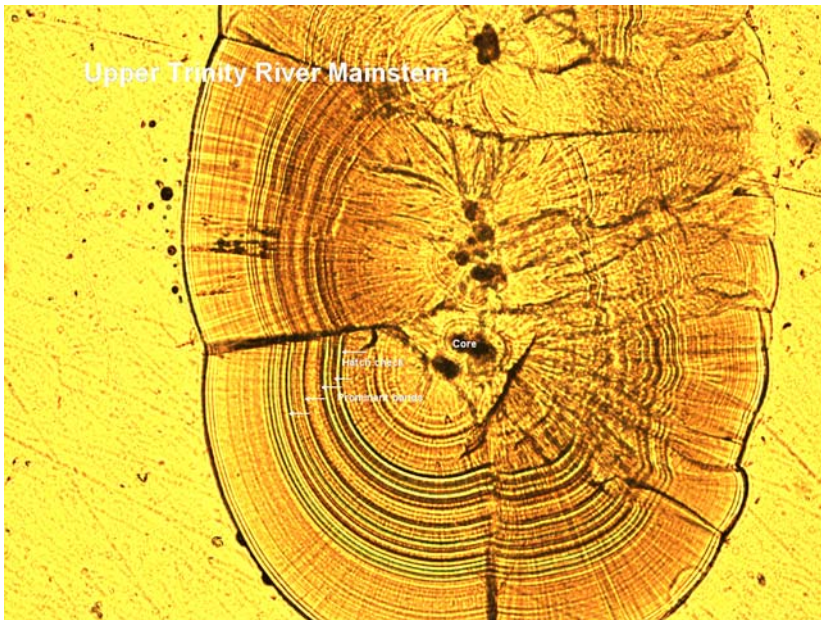

Figure 7. Photograph of an otolith microstructural pattern of a Chinook salmon sampled from upper Trinity River mainstem located in Trinity County, California. Note the four prominent bands post hatch check.

as the North Fork was sampled near the end of March 2004 and again in early April 2004. South Fork was sampled in early March 2004.

This study identified a distinct microstructural pattern in spring Chinook salmon spawned in 2003 in the North and South forks of the Salmon River that differed from patterns documented for other collections in the Klamath Basin. However, results of this study are limited due to small sample sizes, sample size inequality, and its reliance on a single brood year, stream, and race. Additional studies are needed to clarify the specific natal microstructural signature of spring Chinook salmon stocks in the Salmon River, including: (1) otolith study of spring Chinook salmon adults returning to the Salmon River, (2) continuing the otolith study of spring Chinook salmon fry in the Salmon River drainage with increased sample sizes and collection of overwintering water temperatures, (3) a comparative study between fall and spring Chinook salmon fry otoliths in the Salmon River drainage, and (4) a comparative study of spring Chinook salmon fry otolith microstructure from the Salmon River to microstructure of other river systems outside the Klamath Basin.

Acknowledgements

The author would like to thank Nat Pennington and crew of the Salmon River Restoration Council; as well as Toz Soto and crew from the Karuk Tribe for their collection efforts on behalf of this study. The author would also like to acknowledge USFWS personnel Joe Polos, Nicholas Hetrick, Michael Cunanan, David Hines, and James Bettaso for their assistance in preparation of this report. Funding for this study was provided by the Klamath River Basin Conservation Area Restoration Program.

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Appendices

Appendix A Summary of two sample t-test ($\alpha = 0.05$; df=89) used to compare mean fork lengths of spring Chinook salmon collected on the North and South forks of the Salmon River in spring 2004.

Site	n	Mean (mm)	SD (mm)	SE (mm)	t value	p value
North Fork Salmon River	28	36.3	1.8	0.4	1.0	0.3
South Fork Salmon River	63	35.8	2.0	0.3		

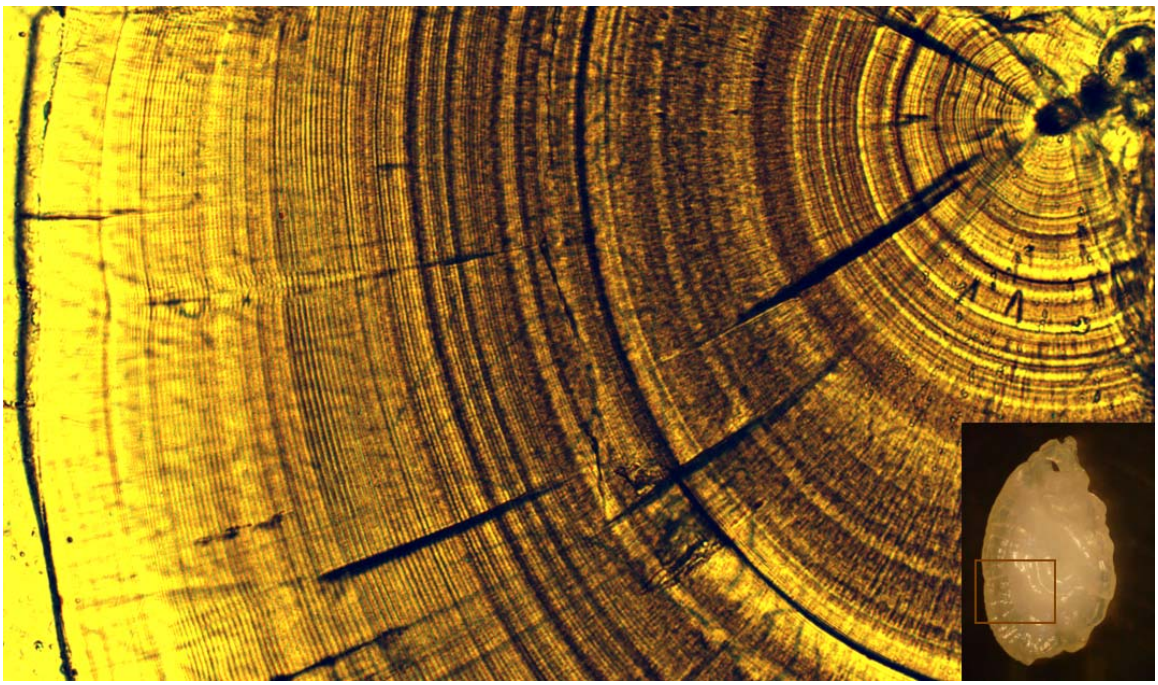
Appendix B. Summary of the developmental check blind test of spring Chinook salmon fry samples from the North (NF) and South(SF) forks of the Salmon River mixed. .

Sample #	NF	SF	Correct?	Comments
1		X	Yes	
2		X	Yes	
3		X	Yes	
4		X	Yes	
5	X		Yes	
6		X	Yes	
7	X		Yes	
8		X	No	Poor Preparation
9	X		Yes	
10	X		Yes	
11		X	No	Poor Preparation
12		X	Yes	
13	X		No	Broken slide
14		X	Yes	
15	X		Yes	
16		X	Yes	
17	X		Yes	
18	X		Yes	
19	X		Yes	
20	X		Yes	
21	X		Yes	
22		X	Yes	
23		X	Yes	
24		X	Yes	
25	X		Yes	
26	X		Yes	
27		X	Yes	
28		X	Yes	
29		X	No	Poor Preparation
30		X	Yes	

Arcata Fisheries Technical Report XXXX DRAFT

Identification of Migratory Juvenile Spring Chinook Salmon via Rotary screw trap on the Salmon River, California

Jane C. Sartori



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March 2006

Funding for this study was provided by the Klamath River Basin Conservation Area Restoration Program (Klamath Fishery Restoration Program).

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Key words: Otolith microstructure, Salmon River, Chinook salmon, rotary screw trap

The correct citation for this report is:

Sartori, Jane C. 2006. Identification of migratory juvenile Chinook salmon from the Salmon River drainage, northern California. U. S. Fish and Wildlife Service, Arcata Fish and Wildlife Office, Arcata Fisheries Technical Report Number XX, Arcata, California.

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Identification of Migratory Juvenile Spring Chinook Salmon via Rotary screw trap on the Salmon River, California

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*Abstract*The Salmon River, located in northwestern California, is one of the last known refuges for naturally produced Klamath basin spring Chinook salmon (*Oncorhynchus tshawytscha*). Previous salmonid distribution and abundance monitoring studies of the Salmon River determined two migration peaks; the primary occurring in spring and the secondary occurring in the fall. To determine if there was any spring Chinook salmon emigrating during the secondary peak, an otolith microstructural study was performed on left sagittal otoliths collected during the secondary peak between the years of 2003-2005.

Of the 58 otolith samples analyzed in this study, a total of 18 otoliths were identified as Salmon River spring Chinook salmon when compared to previous Salmon River juvenile spring Chinook salmon microstructural data ($p > 0.05$). The origination of the remaining 40 otolith samples remained unidentified due to absence of baseline juvenile fall Salmon River Chinook salmon microstructural data and had a different microstructural pattern from the known spring Chinook salmon microstructural pattern ($p < 0.05$).

A secondary study objective was to determine freshwater residency and associated growth rates of all Salmon River Chinook salmon otoliths analyzed in this study. Overall mean freshwater residency was estimated to be 136 days with an estimated mean growth rate of 0.23 mm/day.

Results of this study are preliminary until further studies involving known fall Salmon River Chinook salmon otolith microstructure, adult Salmon River spring and fall otolith microstructure, and genetic analyses can be investigated.

Introduction

Otolith-based research provides information on the population biology and life history of fish that is otherwise extremely difficult, if not impossible, to collect such as daily age and growth rates, hatch and emergence dates, life stage transitions, and habitat transitions (Begg *et al*. 2005). Cyclic depositions of organic and inorganic components of otoliths interact to lay down a series of sequential dark and light bands that reflect the bipartite nature of otolith increments. Unlike scales, otoliths are comprised of crystalline calcium carbonate polymorphs that are embedded in a proteinaceous matrix that, once deposited, is metabolically inert resulting in no resorption or remineralization (Gauldie and Nelson 1990).

Variation in temperature and growth can produce otolith increment patterns that are stock specific, provided the stock incubated under a distinctive thermal regime (Zhang *et al*. 1995, Volk *et al*. 1996, Quinn *et al*. 1999). The resulting increment pattern is specific to the thermal regime under which embryonic and alevin development occurred as it is generally accepted that increment deposition initiates prior to hatching (Quinn *et al*. 1999). For this study, the area of the otolith denoting the developmental life stage of the fish are the increments located between and including the hatch and emergence checks and is referenced as the 'developmental check region' (DC region).

Given that a fish length to otolith length relationship can be determined, the widths of the sequential increments located post-emergence provide daily growth rates of the fish at a specific age and on a specific date provided that increment deposition is daily (Campana and Jones 1992). Since various authors have previously demonstrated the deposition of otolith increments of Chinook salmon to be daily (Wilson and Larkin 1982, Marshall and Parker 1982, Volk *et al*. 1984, Neilson and Geen 1985; and others), this study did not investigate the increment depositional rate and assumes that increment periodicity is daily.

Abundance and distribution studies on emigrating juvenile Chinook salmon (*Oncorhynchus tshawytscha*) of the Salmon River, California, have shown two distinct migration peaks that occur in spring/early summer and in the fall (UFWS, *in prep*, Juvenile Salmonid Monitoring on the Mainstem Salmon River at Somes Bar, CA). The Salmon River supports spring- and fall-run Chinook salmon, as well as other salmonid species such as coho salmon (*O. kisutch*) and steelhead (*O. mykiss*).

The primary objective of this study was to identify and estimate the number of juvenile spring Chinook salmon emigrating from the Salmon River, CA based on screw trap collections throughout the migration season which began in spring and ended in the fall. Unfortunately, collected sample sizes were very small (< 100) and only represented the latter portion of the migration season which eliminated a comparative study between the number of emigrating juvenile spring Chinook salmon found in the primary and secondary migration peaks of the Salmon River. Due to these circumstances, a redirection in the primary objective of a comparative study between the two migration peaks became an identification and enumeration of migrating juvenile Chinook salmon that display the previously identified Salmon River spring Chinook salmon microstructural pattern (Sartori 2005) of the collected screw trap samples. Other study objectives included an estimation of freshwater residency and associated growth rates; and identification of hatch and emergence checks.

Study Area

A rotary screw trap was placed 1.5 river kilometers (rkm) upstream from the confluence of the Salmon River and the Klamath River to monitor distribution and abundance of emigrating juvenile salmonids. Trap site was chosen based on its proximity to the mouth of the Salmon River, accessibility, and a deep thalwag to situate the trap in (W. Pinnix, U.S. Fish and Wildlife Service, personal communication). Trap was checked daily throughout the season which extended from approximately April through October annually; wherein live-box mortalities from trapping efforts were salvaged during the latter part of the migration season to obtain otoliths for microstructural studies (Figure 1).

All salvaged juvenile Chinook salmon mortalities (n = 66) were immediately frozen upon collection to avoid any surface degradation of otoliths by crews from the Karuk Tribe's Natural Resources Department and those from the Salmon River Restoration Council.

Methods

Otolith preparation and analysis

Sagittal otoliths were extracted from the juvenile Chinook salmon mortalities by the 'open-the-hatch' method as described in Secor *et al.* (1991). After extraction, otoliths were cleaned and dried using ambient air temperature before obtaining their weights (nearest 0.00001 grams) and lengths (nearest 0.1 millimeters). Otoliths were then embedded separately in polyester resin before being mounted on a glass slide with thermoplastic cement. After otoliths had been mounted on glass slides, the excess resin above the surface of the otolith was cut off using a low speed saw. Otoliths were then lapped on both sides with a lapping wheel until the primordial region was exposed.

Otolith increments and checks were marked beyond the core region of the otolith to the edge of the otolith on a preferred measurement angle of 73° ($\pm$ 3º) radiating from a transect line that begins at the otolith rostrum proceeding distally through a predetermined nucleus to the otolith postrostrum (see Figure 2 for otolith diagram). Analyzed otolith regions included the following areas: 1) core to beginning of developmental check, 2) developmental check, and 3) end of developmental check to otolith edge. These areas are referred to as 'regions' for the purpose of this study (Figure 3). All linear measurements on otolith samples were recorded and input to a database. All samples were analyzed twice with a lapse of three weeks between analyses to avoid reader bias as the same reader conducted both analyses.

Identification and enumeration of spring Chinook salmon from screw trap samples

Prepared otolith samples were visually examined for incremental patterns and checks associated with the natal portion of the otolith using a transmitted light microscope interfaced with a video camera and a computer equipped with image analysis software. For purposes of this investigation, the natal portion of the otolith included the area of the otolith prior to and including the developmental check region (DC) since increment deposition in this portion of the otolith occur during intragravel development. The developmental check region is the area of the otolith located between the hatch and emergence checks (width). This area denotes the developmental life stage of the fish and the associated incubational thermal regimes that are site specific.

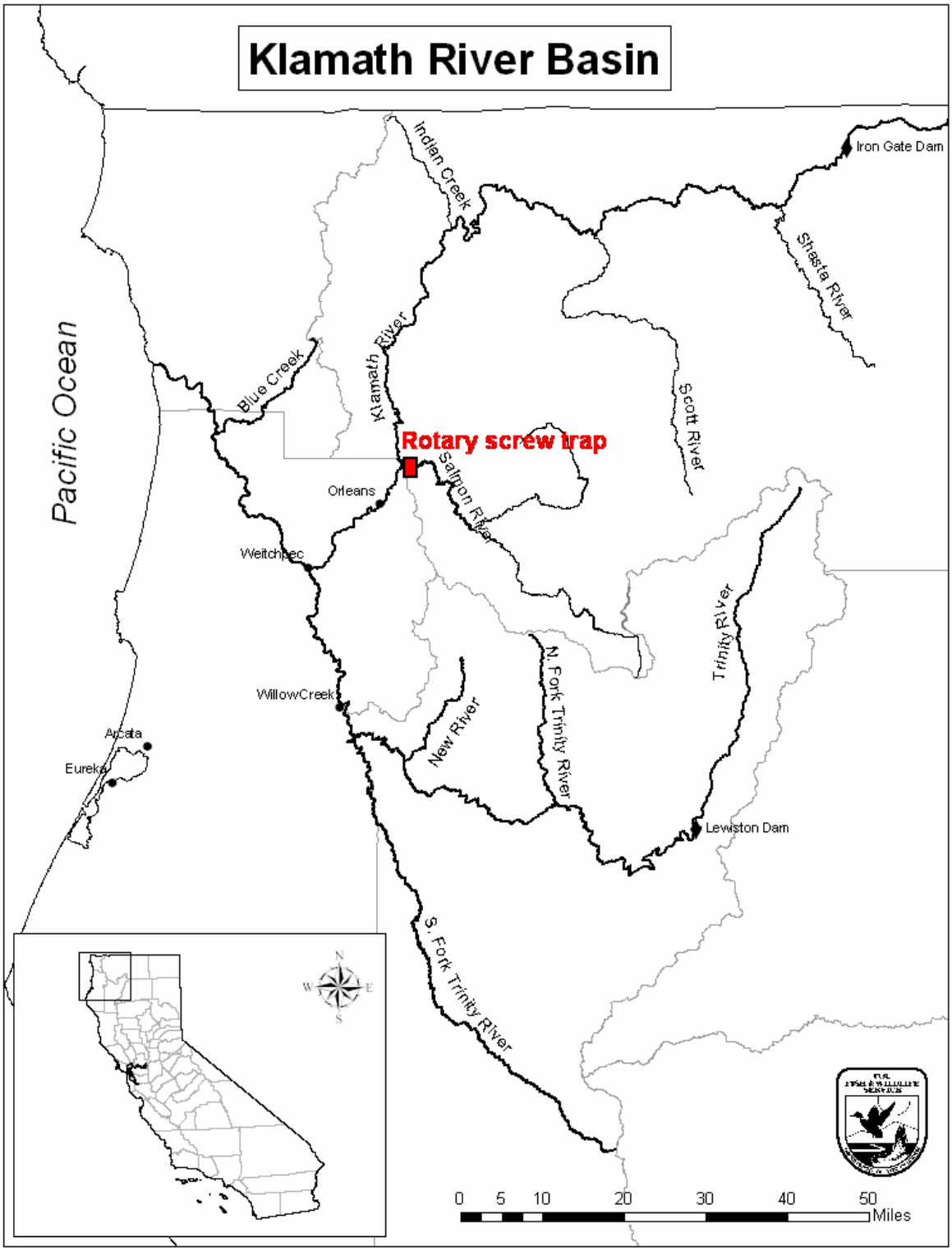

Figure 1. Map of Salmon River rotary screw trap site located in northwestern California.

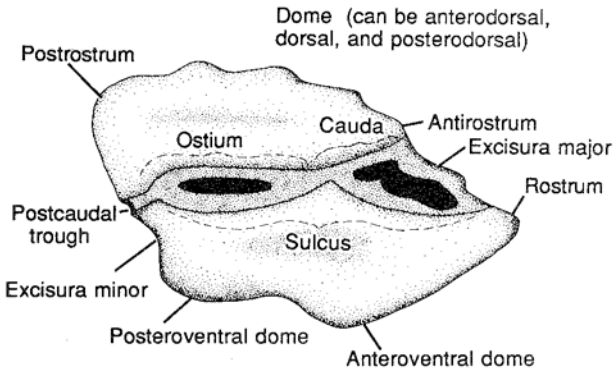

Figure 2. Diagram of a sagittal otolith from a generalized teleost fish (from Cailliet *et al*. 1986).

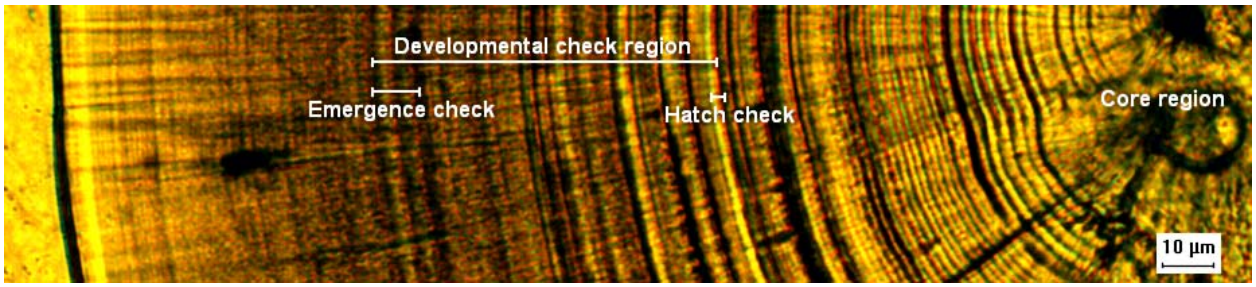

Figure 3. Developmental check sequence of an otolith extracted from a juvenile Chinook salmon originating in the Salmon River sub-basin, CA in 2004.

During visual examination of the collected Salmon River screw trap samples, individual otolith samples were grouped by similarities in appearance. Descriptions of the microstructural patterns for each group of otolith samples were then recorded and compared to a previous documented description of the developmental check region of juvenile Salmon River spring Chinook salmon (Sartori 2005).

Upon completion of the visual analysis, linear measurements of the developmental check regions of all viable Salmon River screw trap otolith samples were taken and recorded to a database. A database query was then performed on linear distances of the developmental check regions of the screw trap otolith samples (distance from otolith core and the width of the developmental check region) to identify the samples that had similar developmental check measurements by using the range of the developmental check measurements found in the otolith samples previously identified as Salmon River spring Chinook salmon (Sartori 2005). Results of this comparative database query was documented, recorded and compared to the results of the visual examination of the screw trap samples.

All samples were visually analyzed twice with a lapse of three weeks between analyses to avoid reader bias as the same reader conducted both visual examinations.

Identification of hatch and emergence checkmarks

Hatch checkmarks of salmonids usually appear in the form of a very dark band or structural discontinuity from previous increments. An emergence checkmark occurs prior to a transitional area from broad or indistinct increments of the post-hatch alevin to the well-defined daily incremental banding of emergent fry (Volk *et al*. 1995).

Prepared otolith samples were visually examined using a transmitted light microscope interfaced with a video camera and a computer equipped image analysis system to determine the appearance of the hatch and emergence checkmarks that occur in the natal portion of the otolith. During visual examination of all viable otolith samples collected at the Salmon River trap site, the hatch check was identified as a distinct dark band followed by a distinct light band that was located beyond the core region of the otolith samples, but preceded an area of broad or indistinct increments that is representative of otolith increments found on post-hatch alevin (Volk *et al*. 1995). Consequently, the emergence check was identified as a series of three dark bands separated by two lighter bands that represented a transitional area from the broad or indistinct increments of the post-hatch alevin to the well defined daily incremental banding of emergent fry. Figure 3 shows the identified hatch and emergence checks located on all Salmon River trap otolith samples.

On conclusion of the visual examination, linear measurements were taken from a consistently prominent nucleus located in the core region of all usable otolith samples outward to the visually identified hatch and emergence checkmarks along a specific radial angle. All measurements were recorded and input to a database.

Freshwater residency and growth rates

To estimate freshwater residency and associated growth rates, it was necessary to first establish a relationship between the fish fork length and the otolith radius. Once the relationship was established, otolith increments were manually marked from the end of the core region of the otolith to the edge of the otolith using a transmitted light microscope interfaced with a video camera and a computer equipped with image analysis software. Measurements included distances between ends of core region to hatch check, hatch check to emergence check, emergence check to edge of otolith, and between individual otolith increments.

Assuming one otolith increment represents one day and counting the number of increments in the freshwater portion of the otolith, it is possible to estimate the number of days an individual fish had resided in the Salmon River prior to collection at the trap site. By estimating the fork length of individual fish samples when they emerged using the model generated by regressing fish length to otolith length, and subtracting this estimate from the measured fork length at time of collection, it is possible to estimate the amount individual fish grew in length while rearing in the Salmon River before being collected at the trap site. By dividing the estimated amount of growth by the number of days residing in the Salmon River yields a growth rate (mm/day) for individual fish.

Data analysis

To establish the relationship between fish length and otolith radius, simple linear regression was applied to regress fish fork lengths (mm) against corresponding otolith radii (µm). Assuming that otolith increment deposition is daily, the fish fork length:otolith

radius model generated from the linear regression, and linear measurements of specific otolith characteristics such as hatch check, emergence check, incremental widths, etc.; it is possible to obtain an estimation of size and growth rates of individual fish for specific life history events such as hatch and emergence, specific daily age, or habitat transitions.

By counting the increments from the emergence check outward to the edge of the otolith and assuming that increments are deposited daily, an estimate of daily age and freshwater residency of the collected juvenile Chinook salmon samples is accomplished if the fish was collected in freshwater. Furthermore, by inputting the linear distance of the emergence check from the otolith core to the fish length:otolith length model to obtain an estimate of fish length at emergence; the resulting fish length estimate is subtracted from the fish length at collection to estimate amount of growth from emergence to time of collection. To estimate daily growth rates per fish, the estimated amount of growth post-emergence to the edge of the otolith (time of collection) is divided by the number of increments encompassed in this area which yields a growth rate (mm/day) for freshwater residency as the fish used in this study were collected as juvenile migrants in freshwater.

To test for difference in linear distance of the developmental check region in terms of distance from otolith core and width on all grouped screw trap otolith samples (grouped by microstructural pattern), an independent *t*-test (Murphy and Willis 1996) was conducted using the following equation:

$$t = (\bar{y}_1 - \bar{y}_2)\sqrt{\frac{n_1 n_2}{n_1 + n_2}} \Big/ \sqrt{\frac{(n_1 - 1)s_1^{\,2} + (n_2 - 1)s_2^{\,2}}{n_1 + n_2 - 2}}$$

where t = statistical difference between two sample means, $\bar{y}$ = sample means, s^2 = sample variances, and n = sample sizes. This test was also applied between any group of screw trap otolith samples that displayed similar developmental check distances and widths to a previous collection of otolith samples collected from known spring Chinook salmon spawning grounds of the Salmon River (Sartori 2005).

To determine if there was a significant change in growth rates during residency in the freshwater rearing habitat of the Salmon River for individual fish collected in the screw trap, a paired t-test was performed on specific growth rates of otolith incremental regions of individual fish (Murphy and Willis 1996) as using the equation:

$$t = \frac{\bar{d} - \mu_d}{s_d / \sqrt{n}}$$

where t = statistical difference between two samples of paired data (growth rates), $\bar{d}$ = the point estimate of the mean difference, μ_d is the hypothesized mean difference of 0, s_d = standard deviation, and n = sample size.

Results

Identification and enumeration of spring Chinook salmon from screw trap samples

Of the total 66 juvenile Chinook salmon live-box mortalities salvaged from the Salmon River rotary screw trap site between the years of 2003 to 2005, 58 otolith samples were viable for this investigation (Table 1). Eight otolith samples were not used due to one or more of the following circumstances: unacceptable radial angle, abnormal crystalline formation of otolith, uneven microstructural growth patterns along radial angle, loss of part or whole otolith, or poor sample preparation.

Visual examination of the 58 otolith samples collected from the screw trap resulted in identification of two distinct developmental check patterns. Qualitative corroboration of the visible separation of two distinct developmental check patterns of the trap samples was accomplished by overlaying a sub-sample (n = 15 for each developmental check pattern) of one developmental check pattern over the other developmental check pattern using an image analysis system. The overlay of one developmental check pattern over the other developmental check pattern resulted in a visible difference in the distance from the otolith core and in width.

By using the overlay method and a sub-sample of a previously identified Salmon River spring Chinook salmon developmental check pattern (Sartori 2005), one screw trap developmental check pattern resulted as having the same developmental check pattern as the Salmon River spring Chinook salmon one. The number of screw trap samples exhibiting the Salmon River spring Chinook salmon developmental check pattern was a total of 18 otolith samples. To determine if the screw trap otolith samples were significantly different from each other and from the previously identified Salmon River spring Chinook salmon otolith samples, independent sample *t*-tests and 'analysis of variance' tests (ANOVA's) were conducted on linear measurements of all usable otolith samples.

Table 1. Number of otoliths collected from juvenile Chinook salmon sampled from a rotary screw trap located 1.5 rkm upriver from the confluence of the Salmon River and the Klamath River, Ca.

Sample Year	No. of Otoliths Collected	No. of Otoliths Usable	Range of Dates
2003	10	8	8/29/2003
2004	32	27	06/07/2004-09/15/2004
2005	27	23	09/27/2005-10/03/2005

The linear measurement comparison of the developmental check region of the 18 otolith samples that exhibited the Salmon River spring Chinook salmon developmental check pattern resulted in no significant difference in distance from the otolith core region and in the width of the developmental check region between the screw trap otolith samples independent of year (ANOVA, $F_{2, 15} = 0.08$, $p = 0.92$; and $F_{2, 15} = 0.78$, $p = 0.47$ respectively). Annual mean linear otolith region distances and widths of developmental check regions representing the screw trap samples that were visibly similar to the Salmon River spring Chinook salmon developmental check regions are listed in Table 2.

When comparing the mean developmental check region linear measurements of the trap samples (n = 18) that were visibly similar to a previously identified Salmon River spring Chinook salmon otolith developmental check pattern (n = 91) using an independent sample *t*-test, there was no significant difference in linear distance from the core region or in the developmental check regional width ($t_{107} = 0.39$, $p = 0.35$; and $t_{107} = 0.58$, $p = 0.29$, respectively). Table 3 summarizes mean linear distances from core region and widths of the developmental check regions found in the otolith samples collected from the Salmon River trap site and from known spring Chinook salmon spawning grounds.

The remaining otolith samples (n = 40) collected for this study shared a specific developmental check pattern that was visibly dissimilar to the developmental check region of the spring Chinook salmon otolith samples. Although the hatch and emergence checks were similar in appearance to the identified spring Chinook salmon otolith samples, the linear distance of the developmental check region from the core region and the developmental check width appeared different (Figure 4). Comparison of the two different developmental check regions represented in the trap otolith samples resulted in a significant difference in the linear distance from the core region and in width ($t_{56} = -7.42$, $p < 0.00$; and $t_{56} = 32.95$, $p < 0.00$, respectively). Table 4 summarizes mean linear developmental check distances from otolith core and the developmental check widths of the two representative Salmon River trap otolith developmental check patterns.

Table 2. Summary of mean linear distances of the developmental check region (DC) from the otolith core (C) and the DC width on all otolith samples collected from the Salmon River rotary screw trap that displayed the Salmon River spring Chinook salmon (SRSP) developmental check pattern.

Year	Otolith Region	Mean (µm)	SE (µm)	n
2003	C to DC	60.77	2.73	3
	DC	87.73	0.63	
2004	C to DC	59.65	1.49	10
	DC	88.54	0.34	
2005	C to DC	59.50	2.11	5
	DC	88.65	0.48	

Table 3. Summary of mean linear distances of the developmental check region (DC) from the otolith core (C) and the DC width of otolith samples collected from the Salmon River screw trap that displayed the same developmental check pattern as otolith samples collected from known Salmon River spring Chinook salmon spawning grounds.

Site	Otolith region	Mean (µm)	SD (µm)	n
Spawning grounds	C to DC	60.15	3.27	91
	DC	88.63	1.37	
Rotary screw trap	C to DC	59.80	4.46	18
	DC	88.43	1.07	

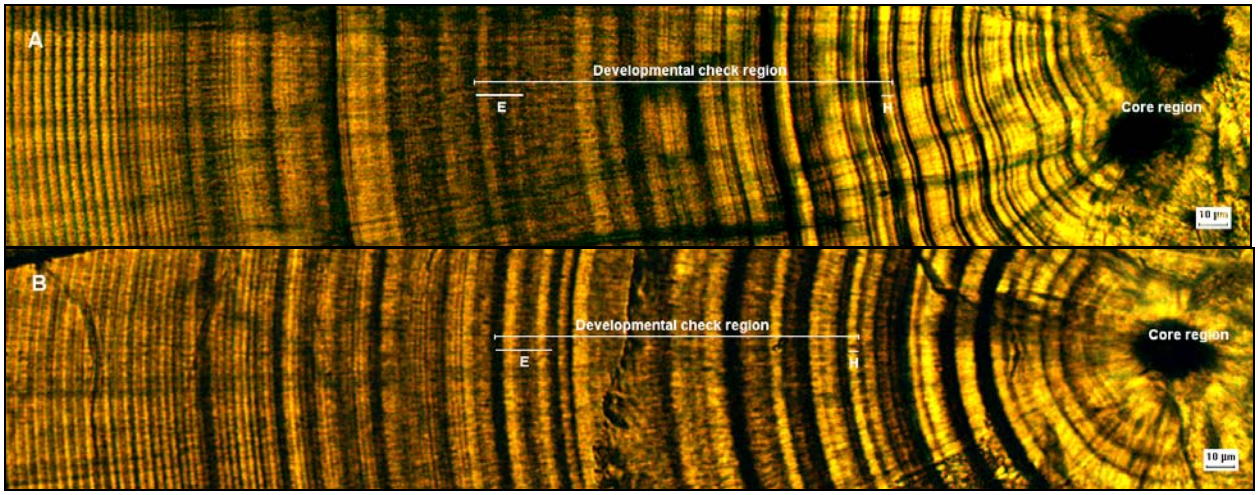

Figure 4. Representative developmental check regions of otoliths from juvenile Chinook salmon salvaged from the Salmon River rotary screw trap in 2004. (A) Shows the developmental check region displayed by Salmon River spring Chinook salmon and (B) shows the developmental check region of an unspecified Salmon River Chinook salmon stock.

Although the developmental check region on 40 of the otolith study samples collected at the Salmon River trap site was significantly different from that of the other 18 otolith samples which displayed a similar developmental check region to that of a previously identified spring Chinook salmon developmental check (Sartori 2005), there was no significant difference among the 40 samples in linear distance from the otolith core or in width between sample years (ANOVA, $F_{2, 37} = 0.21$, $p = 0.81$; and $F_{2, 37} = 0.13$, $p = 0.88$, respectively). Annual mean linear otolith regions distances and width of the screw trap samples that were not identified as having the developmental check pattern of the previously identified Salmon River spring Chinook salmon are listed in Table 5 as 'SR-A'; whereas the Salmon River spring Chinook salmon otolith samples are listed as 'SRSP'.

Table 4. Mean linear distances of the developmental check region (DC) from the otolith core (C) and the DC width on identified juvenile spring Chinook salmon otolith samples (SRSP) and unspecified juvenile Chinook salmon otolith samples (SR-A) collected from the Salmon River rotary screw trap. Otolith samples represent collection years 2003-2005.

Site	Otolith pattern	Otolith region	Mean (µm)	SD (µm)	n
Salmon River screw trap	SRSP	C to DC	59.80	4.46	18
		DC	88.44	1.07	
	SR-A	C to DC	75.67	8.54	40
		DC	65.76	2.82	

Table 5. Mean linear distances of the developmental check region (DC) from the otolith core (C) and the DC width on all unspecified Salmon River juvenile Chinook salmon otolith samples.

Year	Otolith Region	Mean (µm)	SE (µm)	n
2003	C to DC	76.47	3.90	5
	DC	65.23	1.29	
2004	C to DC	74.63	2.11	17
	DC	65.95	0.70	
2005	C to DC	76.43	2.05	18
	DC	65.73	0.68	

Since there are no documented baseline Salmon River juvenile Chinook salmon otolith samples that display the same developmental check pattern as the 40 screw trap samples, the specific origin of these samples remain unknown.

Freshwater residency and growth rates

Fish fork length was correlated with corresponding otolith radii (Figure 5, $r = 0.88$, $n = 58$) and was used in conjunction with the assumption that otolith increment deposition was daily to estimate freshwater residency and associated growth rates. Overall mean freshwater residency was estimated to be 136 days $\pm$ 31 days with an overall mean growth rate of 0.23mm/day $\pm$ 0.09 mm/day.

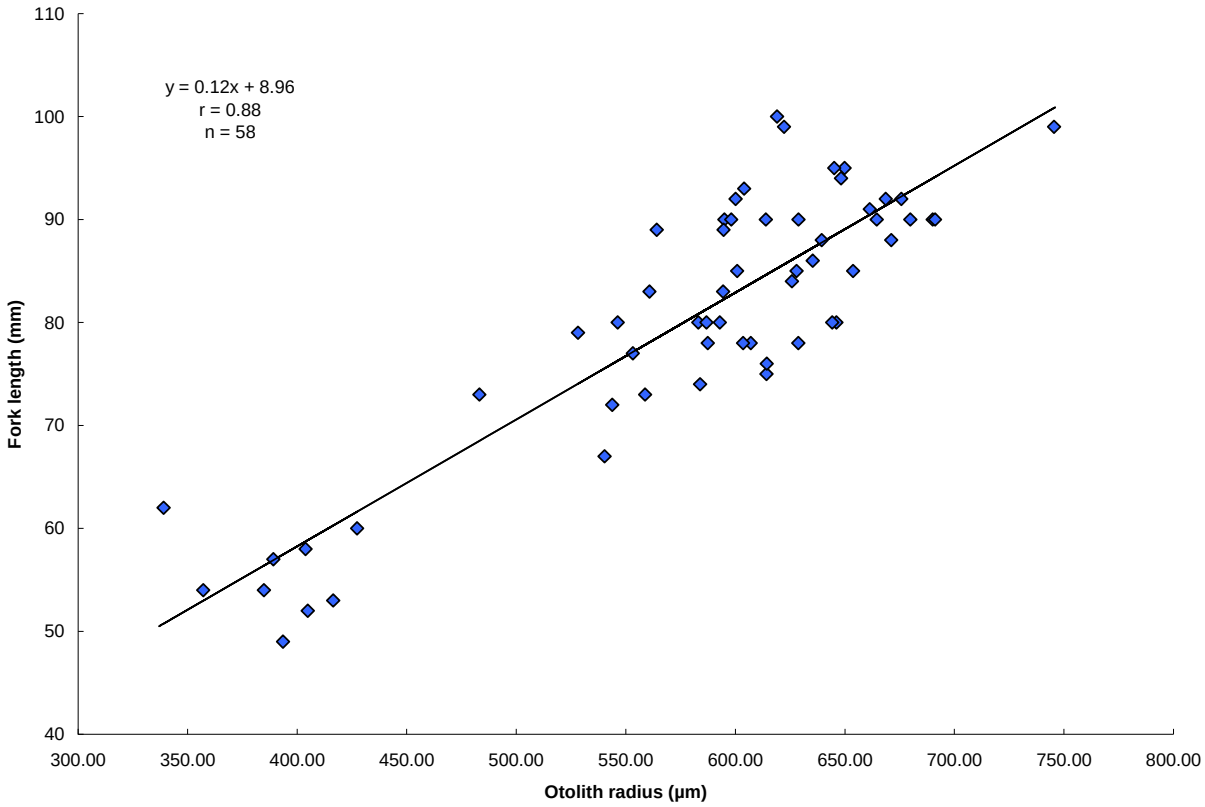

Figure 5. Relationship between fish fork length (mm) and otolith radius (µm) of juvenile Chinook salmon collected from the Salmon River rotary screw trap site between the years 2003-2005.

Incremental widths normally associated with freshwater generally average < 3 µm in width (Neilson *et al*. 1985, Beamer *et al*. 2000) for juvenile Chinook salmon. However, during visual analyses of the otolith samples used in this study, there was an observed increase in incremental width (Figure 6) on 57 of the 58 otolith samples which indicated a change in the freshwater growth rate. Linear measurements of these areas of observed increased incremental widths supported the visual observations. The mean incremental widths changed from a typical (< 3 µm) freshwater mean incremental width of 2.48 µm $\pm$ 0.16 µm to an atypical (> 3 µm) freshwater mean incremental width of 3.38µm $\pm$ 0.18 µm per individual fish. The associated growth rate for this group of increased incremental widths was 0.39 mm/day $\pm$ 0.02 mm and the residency period represented by the increased incremental widths was approximately 25 days. The mean overall fork length of fish at the beginning of the increased incremental width otolith area was approximately 58 mm $\pm$ 8 mm and was approximately 68 mm $\pm$ 10 mm at the end of the increased incremental width otolith area. The mean growth rate for this area of increased incremental width was approximately 0.39 mm/day $\pm$ 0.02 mm which was dissimilar to the mean growth rate of approximately 0.22 mm/day $\pm$ 0.09 mm for the other post-emergent otolith increments.

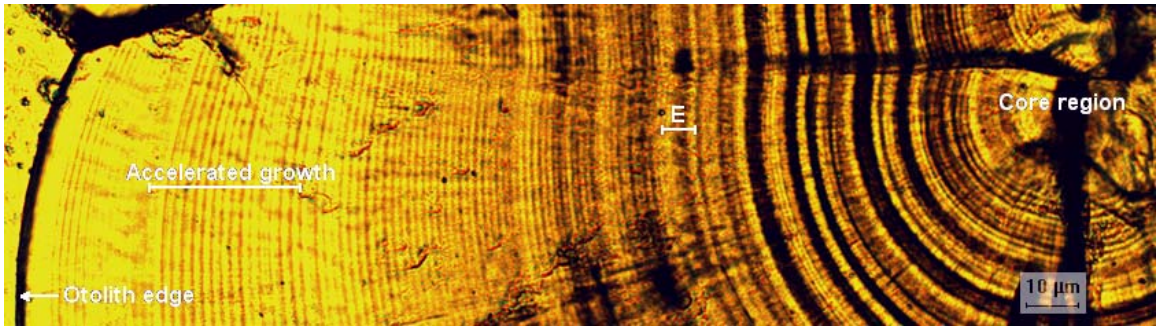

Figure 6. Representative otolith sample collected from the Salmon River rotary screw trap displaying an area of increased incremental widths located beyond the emergence check (E) and prior to the edge of the otolith (i.e. time of collection).

Results of a paired *t*-test indicated that there was a significant difference between the typical freshwater incremental widths and the atypical freshwater incremental widths (t_{56} = 13.44, n = 57, p<0.00).

Only otolith samples with more than 10 consecutive sequential increments that displayed atypical freshwater incremental widths were used to determine the amount of change in width and ultimately the amount of change in growth rates per individual fish. Assuming that incremental deposition is daily, incremental counts > 10 indicated that migrating juvenile Chinook salmon had settled in a particular area of the river longer than a week before resuming migration to the estuary and/or ocean. Table 6 summarizes the overall mean residency times and associated growth rates for the different types of freshwater growth increments (typical and atypical).

Identification of hatch and emergence checkmarks

Although similar hatch and emergence checkmarks were identified on all trap samples, the location of the hatch check was found to be pattern-selective. Mean linear distance between the hatch check and the end of the core region for otolith samples exhibiting the same developmental check pattern as the Salmon River spring Chinook salmon developmental check pattern was 60.15 µm $\pm$ 3.27 µm; whereas the mean linear distance between the hatch check and the end of the core region for the other identified developmental check pattern of the screw trap samples was 75.67 µm $\pm$ 8.54 µm. Results of a two sample *t*-test indicated there was a significant difference between the two developmental check patterns identified in the screw trap samples in terms of the overall mean linear hatch check distance from the core region (t_{56} = -7.42, p < 0.00) and the overall mean linear distance of the emergence check from the core region (t_{56} = 3.07, p < 0.00).

Table 6. Overall mean freshwater residency and associated growth rates categorized by type of freshwater otolith increment for all juvenile Chinook salmon otolith samples collected during the secondary migration peak of the Salmon River, CA between the years 2003-2005.

Site	n	Freshwater increment category	Mean increment width (µm) ± SD	Mean increment count ± SD	Mean growth rate/day (mm) ± SD
Salmon River trap site	57	Typical	2.49 ± 0.16	112 ± 28	0.23 ± 0.09
		Atypical	3.38 ± 0.19	25 ± 10	0.39 ± 0.02

Discussion

Variation in temperature and growth can produce otolith increment patterns that are stock specific, provided the stock incubated under a distinctive thermal regime (Zhang *et al*. 1995, Volk *et al*. 1996, Quinn *et al*. 1999). The resulting increment pattern is specific to the thermal regime under which embryonic and alevin development occurred (Quinn *et al*. 1999). In this study, the developmental check region encompassed the area between the hatch check and the emergence check which were included as part of the check region. Visual examinations of the prepared Chinook salmon otolith samples salvaged from the Salmon River rotary screw trap indicated two distinct developmental check patterns. One particular developmental check pattern was more prevalent than the other during the visual examinations and was not similar in distance from core region and width in comparison to the known Salmon River spring Chinook salmon developmental check pattern when compared using an independent sample *t*-test.

The predominant developmental check pattern (69% of total sample size) had no previous juvenile spawning-ground baseline data and so was arbitrarily given a misnomer of 'SR-A' to indicate an unidentified Chinook salmon stock, whereas the remaining 31% otolith samples were identified as having a Salmon River spring Chinook salmon developmental check microstructural pattern ('SRSP'). As the Salmon River supports both fall- and spring-run Chinook salmon, the 'SR-A' otolith samples may possibly be representative of Salmon River fall Chinook salmon; although this is a best-guess scenario since there is no juvenile baseline data to support this theory. Both Salmon River developmental check patterns were visually different from other collected Klamath River basin juvenile Chinook salmon otolith samples. The other Klamath River basin sites included Iron Gate hatchery, Trinity River hatchery, and the upper Trinity River mainstem near the Trinity River hatchery (Figures 7-9). The visual differences among the otolith collections suggest that the developmental thermal regimes varied between collection sites.

The Salmon River spring Chinook salmon are known to spawn in the North- and South-Forks of the river, but not in the mainstem portion of the river, whereas the fall-run

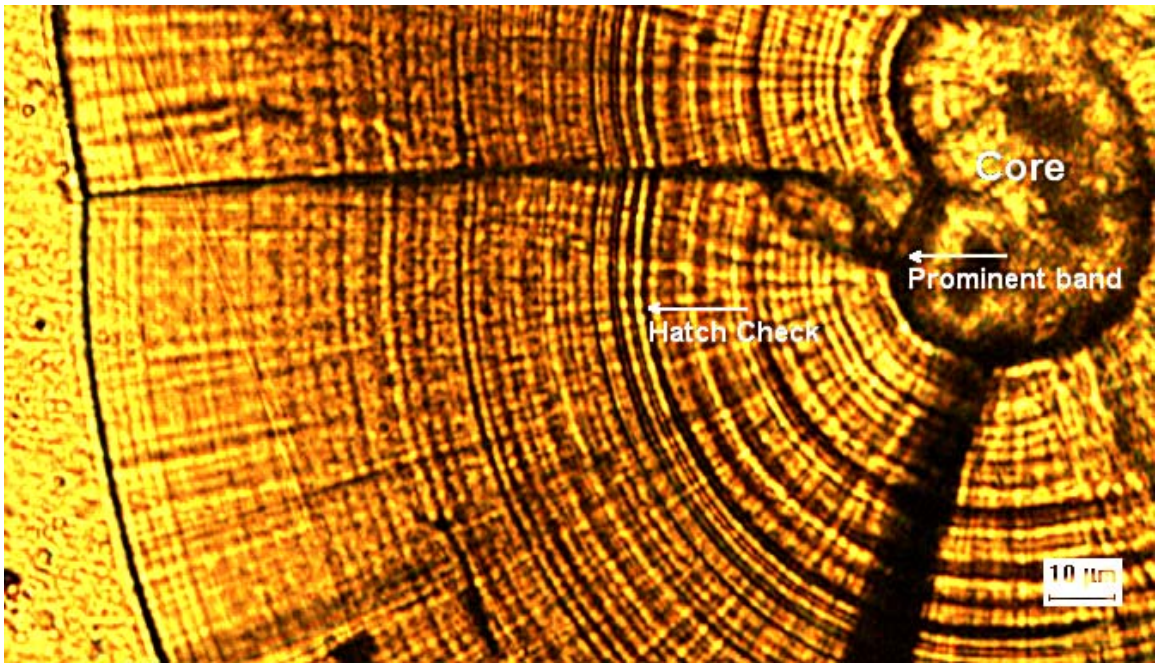

Figure 7. Image of otolith microstructural pattern representative of fall Chinook salmon from Iron Gate Hatchery located in Siskiyou County, CA. Note the prominent band surrounding the core region which differentiates this particular pattern from other Klamath Basin patterns sampled thus far.

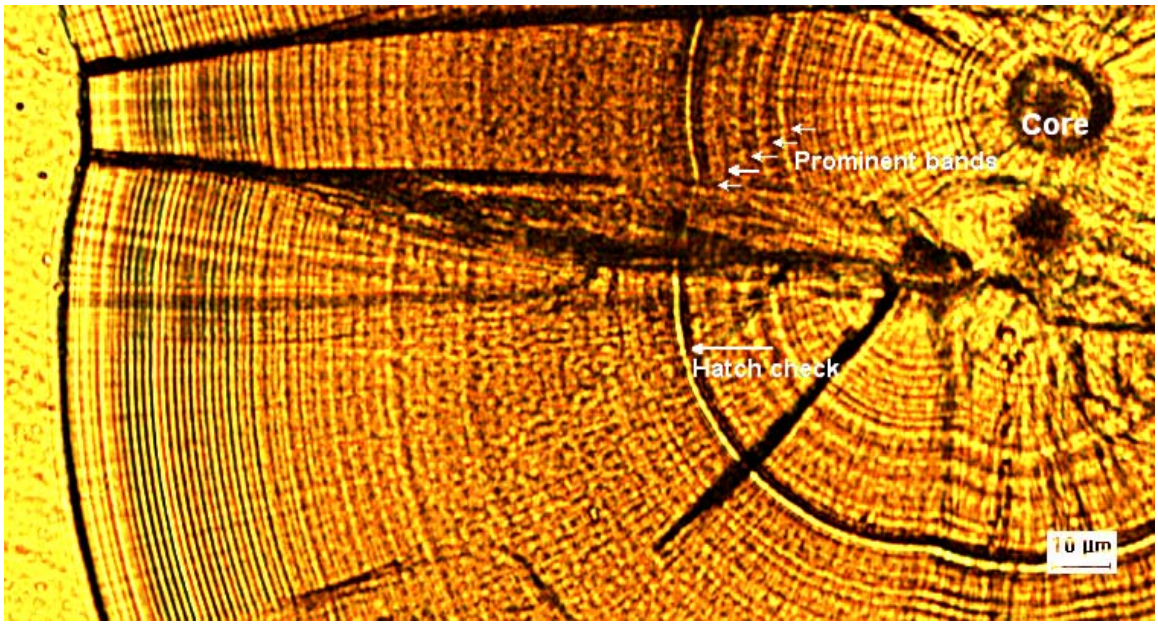

Figure 8. Image of otolith microstructural pattern representative of fall Chinook salmon from the Trinity River Hatchery located in Trinity County, CA. Note the five prominent bands occurring prior to the hatch check.

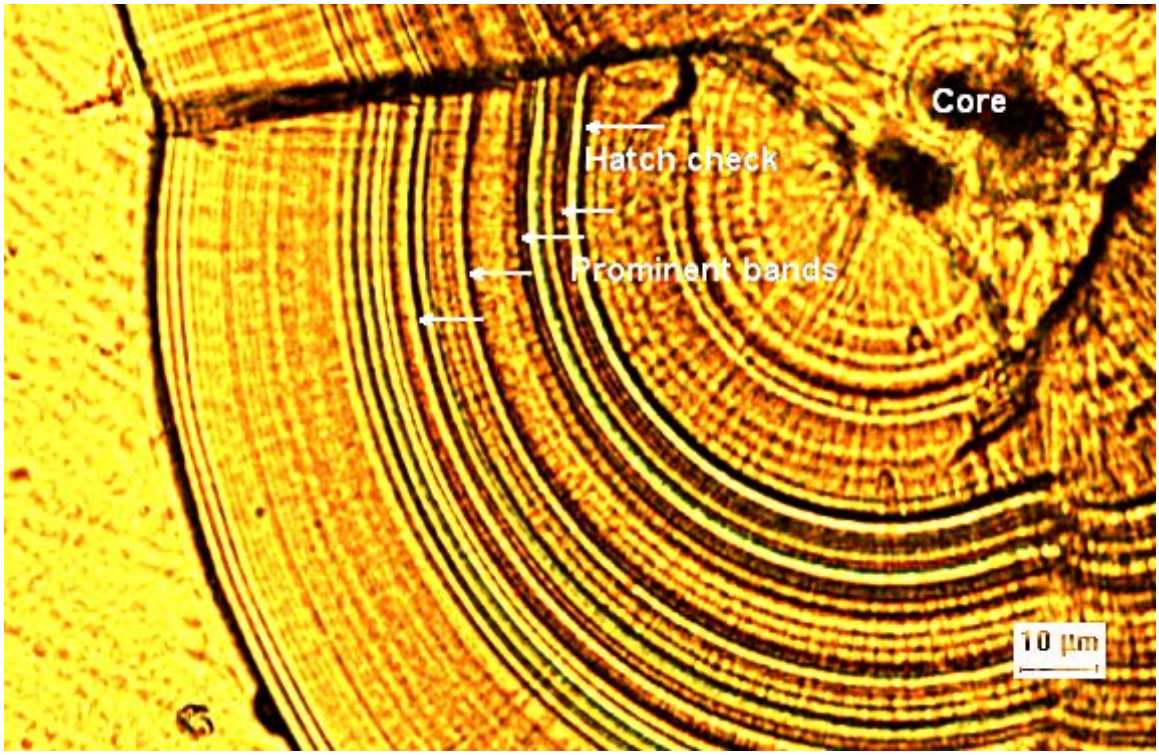

Figure 9. Image of an otolith microstructural pattern of a Chinook salmon sampled from upper Trinity River mainstem located in Trinity County, CA. Note the four prominent bands post hatch check.

Chinook salmon is known to only spawn in the river's mainstem and lower tributaries (P. Brucker and N. Pennington, Salmon River Restoration Council, personal communication). Once emergence occurs, rearing and emigration of both fall-and spring-run Chinook salmon occur during the same time periods (Table 7) which makes it possible to have both runs migrating through the trap site in the same time frame. Without recorded intra-gravel thermal regimes of known fall- and spring-run Chinook salmon incubational sites, any identification of fall- and spring-run Chinook salmon originating in the Salmon River sub-basin is preliminary until such data is available to correlate otolith natal microstructure to site specific thermal regimes.

Comparative results between the developmental check patterns of previously identified spring Chinook salmon otolith samples and developmental check patterns of otolith samples salvaged from the trap site exhibiting similar developmental check patterns of the spring Chinook salmon were not significantly different in either distance from the otolith core region or in width. This would suggest that all the screw trap otolith samples that displayed the similar developmental check region as the otolith samples collected from known Salmon River spring Chinook salmon spawning grounds were affected by similar incubational thermal regimes.

Table 7. Salmon River, CA life stage periodicity table for Chinook salmon. Table is courtesy of the Natural Resources Department of the Karuk Tribe.

Species/Life Stage	Run	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Redd construction	Spring									X	X		
	Fall										X	X	
Egg incubation/fry emergence	Spring	X	X	X	X	X				X	X	X	X
	Fall	X	X	X	X	X					X	X	X
Fry rearing (up to 50 mm)	Spring				X	X	X	X					
	Fall				X	X	X	X					
Juvenile YOY rearing (>50 mm)	Spring				X	X	X	X	X	X	X	X	X
	Fall				X	X	X	X	X	X	X	X	X
Juvenile yearling rearing (>50 mm)	Spring	X	X	X									
	Fall	X	X	X									
Juvenile emigration (>50 mm)	Spring	X	X	X	X	X	X	X	X	X	X	X	X
	Fall	X	X	X	X	X	X	X	X	X	X	X	X

One consistent similarity for all otolith samples salvaged from the trap site during the secondary migration peak, regardless of possible run-type, was an area of sequential post-emergent increments that had dramatically increased in width from other post-emergent increments prior to otolith collection. One otolith sample was not used in this portion of the analysis due to the small number of increments in this particular area of the otolith (n <10). This area of increased incremental width suggests an increase in fish growth since it is generally accepted that otolith increment width is an indicator of fish growth if fish length is correlated to otolith diameter (Volk *et al*. 1984, Thorrold and Williams 1989). For this investigation, there was a positive correlation between fish fork length to otolith radius (r = 0.88).

The increase of freshwater otolith incremental widths from a mean of 2.49 µm to a mean of 3.38 µm is typically seen in habitat areas just prior to an estuarine habitat (Beamer *et al*. 2000) which is different from the location of the Salmon River trap site from which the otolith samples were obtained. In the study conducted by Beamer *et al*., the habitat just prior to the Skagit River estuary exhibited mean incremental widths of 3.68 µm $\pm$ 0.49 µm which was dissimilar to the mean freshwater increments found on the same Skagit River otoliths (2.31 µm $\pm$ 0.10 µm). One possible explanation for this increased freshwater incremental width anomaly is a transition from an unfavorable freshwater habitat to a habitat which encompassed environmental variables more favorable to fish growth. Habitat variables such as optimum water temperatures, low population densities, and an abundance of prey would facilitate increased fish growth that would be represented by increased otolith incremental widths (Neilson *et al*. 1985).

Otolith microstructure of collected emigrating Salmon River juvenile Chinook salmon indicated an overall mean residency of approximately 25 days in the proposed "optimal freshwater habitat" with a calculated mean increase in fish fork length of 10mm. This increase in growth during the residency period in the proposed freshwater habitat suggests that environmental conditions were conducive to fish growth as indicated by the change in otolith incremental widths. To understand why fish reside in the proposed habitat instead of continuing migration to the estuary and/or ocean, an examination of riverine conditions should be examined.

Salmon River juvenile Chinook salmon migrating to the estuary and/or ocean must first transition from the Salmon River into the Klamath River during the months from April to October. As the otolith samples collected for this study only reflect the latter months of the migration season (approximately August through October), only the riverine conditions during those months will be discussed. Personal communication with T. Soto, Department of Natural Resources of the Karuk Tribe, and N. Pennington, Salmon River Restoration Council; indicated that poor water quality conditions existed in the Klamath River prior to the secondary migration peak between the years 2003-2005 such as increased water temperatures and an increase in algal concentrations. If the water quality conditions were an impediment to juvenile Salmon River Chinook salmon transitioning to the Klamath River, a possibility of the fish remaining in the Salmon River until water quality conditions improved may have existed. Accordingly, there was no visible checkmark that may have associated a transition from the Salmon River to the Klamath River found on any of the otolith samples used in this study. Without a visible checkmark on the otoliths denoting a transition from the Salmon River to the Klamath River, any increase in incremental widths would be assumed to have occurred in the Salmon River.

This report identified the number of juvenile spring Chinook salmon of the total sample group collected from the live-box of the Salmon River rotary screw trap during the secondary migration peak between the years 2003-2005 based on otolith microstructure. Other otolith characteristics identified were freshwater residency rates, growth rates, and specific life-history microstructural checks. However, results of this study were limited due to annual and overall small sample sizes, absence of otolith samples representing the primary peak of emigrating juvenile Chinook salmon, and absence of baseline fall Chinook salmon natal spawning ground data. Additional studies are needed to confirm specific natal microstructural signatures of spring and fall Chinook salmon stocks of the Salmon River, including: 1) otolith studies on fall-run Chinook salmon fry otoliths collected from known spawning grounds in the Salmon River sub-basin, 2) otolith studies of spring and fall Chinook salmon adults from spawning grounds in the Salmon River sub-basin, 3) identification of the relationship between incubational thermal regimes of known spring and fall Chinook salmon natal grounds and associated otolith microstructural pattern, 4) genetic analyses of identified spring and fall Chinook salmon derived from otolith microstructure, and 5) a comparative study of spring Chinook salmon fry otolith microstructure from the Salmon River to microstructure of other river systems outside the Klamath Basin.

Acknowledgements

The author would like to thank Nat Pennington and crew of the Salmon River Restoration Council; as well as Toz Soto and crew from the Karuk Tribe for their collection efforts on behalf of this study. The author would also like to acknowledge USFWS personnel Michael Cunanan for database creation and Joe Polos for his role as editor. Funding for this study was provided by the Klamath River Basin Conservation Area Restoration Program.

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Personal Communication

Brucker, P. Salmon River Restoration Council, Sawyers Bar, CA.

Pennington, N. Salmon River Restoration Council, Sawyers Bar, CA.

Pinnix, W. U.S. Fish and Wildlife Service, Arcata Fish and Wildlife Office, Arcata, CA.

Soto, T. Karuk Tribe, Department of Natural Resources, Orleans, CA.

Date	Reach	Redd #	Redds Observed	# of fish on redd	% Canopy Over Redd	Instream Cover (none, wood, boulder, white water, undercut ledge, pool)	Proximity to instream cover in ft.
9/21/2006	Petersburg- East Fork	1	1	0	50	None	2
9/21/2006	Blindhorse - Petersburg	1		1	75	None	-
9/21/2006	Blindhorse - Petersburg	2		4	0	pool/pool	25
9/21/2006	Blindhorse - Petersburg	3		3	5	pool/ white water	20/25
9/21/2006	Blindhorse - Petersburg	4	4	0	5	pool	30
9/21/2006	Cecil - Limestone	1	1	0	0	none	n/a
9/21/2006	Georges - Confluence	0	0	0	n/a	n/a	n/a
9/21/2006	Little South Fork - Grizzly	1		0	0	white water	10
9/21/2006	Little South Fork - Grizzly	2		0	0	pool/ ledge	40
9/21/2006	Little South Fork - Grizzly	3		0	60	pool/ ledge	50
9/21/2006	Little South Fork - Grizzly	4		0	30	pool/ ledge	55
9/21/2006	Little South Fork - Grizzly	5		0	75	pool/ white water	75
9/21/2006	Little South Fork - Grizzly	6		1	0	pool	30
9/21/2006	Little South Fork - Grizzly	7		1	0	boulder/ white water	25
9/21/2006	Little South Fork - Grizzly	8		1	0	pool/ledge	25
9/21/2006	Little South Fork - Grizzly	9		1	0	pool/ledge	35
9/21/2006	Little South Fork - Grizzly	10	10	0	10	boulder/ white water	30
9/21/2006	East fork - Cecil Creek	1		1	35	undercut ledge	1 / zero
9/21/2006	East fork - Cecil Creek	2		1	15	none	0
9/21/2006	East fork - Cecil Creek	3	3	0	30	white water/ pool	15/35
9/27/2006	Cecilville - French	1		1	10	pool	40
9/27/2006	Cecilville - French	2		1	10	pool	30
9/27/2006	Cecilville - French	3	3	0	5	wood	10
9/28/2006	E. Fork - Cecil Creek	1		0	50	wood, ledge	5
9/28/2006	E. Fork - Cecil Creek	2		0	5	none	N/A
9/28/2006	E. Fork - Cecil Creek	3	3	0	30	none	N/A
9/28/2006	Limestone - Smith Creek	1		0	5	rock/ log/ bubbles	40
9/28/2006	Limestone - Smith Creek	2		0	5	rock/ log/ bubbles	40
9/28/2006	Limestone - Smith Creek	3		0	5	rock/ log/ bubbles	40
9/28/2006	Limestone - Smith Creek	4		0	5	rock/ log/ bubbles	40
9/28/2006	Limestone - Smith Creek	5		0	20	none	n/a
9/28/2006	Limestone - Smith Creek	6		1	35	rock	10
9/28/2006	Limestone - Smith Creek	7		0	35	rock	5
9/28/2006	Limestone - Smith Creek	8		0	3	white water	10
9/28/2006	Limestone - Smith Creek	9		1	45	pool	30
9/28/2006	Limestone - Smith Creek	10		1	45	pool	20
9/28/2006	Limestone - Smith Creek	11		0	35	white water/pool	15-20
9/28/2006	Limestone - Smith Creek	12		1	30	pool	30+
9/28/2006	Limestone - Smith Creek	13		1	20	pool	30+

9/28/2006	Limestone - Smith Creek	14		0	50	pool		40
9/28/2006	Limestone - Smith Creek	15	15	0	5	pool		50
9/28/2006	Little Grizzly - Blindhorse	1		0	5	undercut ledge		20
9/28/2006	Little Grizzly - Blindhorse	2		0	10	none	--	
9/28/2006	Little Grizzly - Blindhorse	3		0	20	whitewater		12
9/28/2006	Little Grizzly - Blindhorse	4		3	40	pool		24
9/28/2006	Little Grizzly - Blindhorse	5		1	15	undercut ledge		30
9/28/2006	Little Grizzly - Blindhorse	6		2	35	pool		18
9/28/2006	Little Grizzly - Blindhorse	7		0	65	none	--	
9/28/2006	Little Grizzly - Blindhorse	8		2	60	none	--	
9/28/2006	Little Grizzly - Blindhorse	9		1	50	none	--	
9/28/2006	Little Grizzly - Blindhorse	10		0	0	pool		20
9/28/2006	Little Grizzly - Blindhorse	11	11	0	10	whitewater		10
9/28/2006	Georges - East Fork	1	1	2	90	wood, undercut ledg		30
9/28/2006	Blindhorse - Petersburg	1		3	10	pool/ w. water		30
9/28/2006	Blindhorse - Petersburg	2		2	75	pool		30
9/28/2006	Blindhorse - Petersburg	3		5	0	pool		10
9/28/2006	Blindhorse - Petersburg	4		1	10	pool/ w. water		10
9/28/2006	Blindhorse - Petersburg	5		2	0	pool		30
9/28/2006	Blindhorse - Petersburg	6		1	0	pool		20
9/28/2006	Blindhorse - Petersburg	7		3	0	pool		35
9/28/2006	Blindhorse - Petersburg	8		1	5	pool		50
9/28/2006	Blindhorse - Petersburg	9	9	1	0	pool		30
9/28/2006	Petersburg - East Fork	1		2	10	none		15
9/28/2006	Petersburg - East Fork	2		1	10	none		3
9/28/2006	Petersburg - East Fork	3		0	60	disturbance wh. Wat		0.5
9/28/2006	Petersburg - East Fork	4		2	5	disturbance wh. Wat		0.5
9/28/2006	Petersburg - East Fork	5		1	25	disturbance wh. Wat		0.5
9/28/2006	Petersburg - East Fork	6	6	1	5	disturbance wh. Wat		3
10/3/2006	Little S. F. - blindhorse	1		0	0	pool		20
10/3/2006	Little S. F. - blindhorse	2	2	0	0	pool		40
10/4/2006	Idlewild - Whites gulch	1		1	40	pool		15
10/4/2006	Idlewild - Whites gulch	2		6	25	pool		15
10/4/2006	Idlewild - Whites gulch	3		0	25	pool		20
10/4/2006	Idlewild - Whites gulch	4		0	25	pool		25
10/4/2006	Idlewild - Whites gulch	5		1	30	pool		30
10/4/2006	Idlewild - Whites gulch	6		2	15	none	n/a	
10/4/2006	Idlewild - Whites gulch	7		1	40	none	n/a	
10/4/2006	Idlewild - Whites gulch	8		1	45	none	n/a	
10/4/2006	Idlewild - Whites gulch	9	9	2	20	pool		20
10/4/2006	Big Creek - Mule (I)	1		0	65	pool, terr. Veg		15
10/4/2006	Big Creek - Mule (I)	2	2	0	0	pool		15
10/4/2006	Mule Bridge - Idlewild	1		2	65	pool		30
10/4/2006	Mule Bridge - Idlewild	2		2	5	pool		40

10/4/2006	Mule Bridge - Idlewild	3	3	1	80	none	n/a	
10/5/2006	Petersburg - Eastfork	1		1	0	pool		5
10/5/2006	Petersburg - Eastfork	2		1	0	pool		15
10/5/2006	Petersburg - Eastfork	3		1	0	pool		15
10/5/2006	Petersburg - Eastfork	4	4	1	0	boulder/ wood		35
10/5/2006	East Fork	1		1	0	pool		20
10/5/2006	East Fork	2		6	0	pool		10
10/5/2006	East Fork	3		6	0	pool		10
10/5/2006	East Fork	4	4	1	60	pool		30
10/5/2006	Cecil - Limestone	1		0	90	none	n/a	
10/5/2006	Cecil - Limestone	2		1	90	wood		6
10/5/2006	Cecil - Limestone	3		4	10	boulder pool		3
10/5/2006	Cecil - Limestone	4		2	20	pool wood/ boulder		3
10/5/2006	Cecil - Limestone	5		0	75	undercut ledge		10
10/5/2006	Cecil - Limestone	6		1	90	undercut ledge		8
10/5/2006	Cecil - Limestone	7		0	0	boulder		10
10/5/2006	Cecil - Limestone	8		0	100	undercut ledge		8
10/5/2006	Cecil - Limestone	9		1	80	undercut ledge		4
10/5/2006	Cecil - Limestone	10		6	80	wood		1
10/5/2006	Cecil - Limestone	11		0	20	wood		2
10/5/2006	Cecil - Limestone	12		0	70	willow wood		0
10/5/2006	Cecil - Limestone	13		1	10	grass		4
10/5/2006	Cecil - Limestone	14		1	80	undercut ledge		3
10/5/2006	Cecil - Limestone	15		2	20	pool wood/ boulder		30
10/5/2006	Cecil - Limestone	16		6	100	undercut ledge		8
10/5/2006	Cecil - Limestone	17	17	2	90	grass		4
10/5/2006	East fork to Cecilville	1		0	0	None		0
10/5/2006	East fork to Cecilville	2		2	0	undercut ledge		5
10/5/2006	East fork to Cecilville	3	3	0	30	dead trees		20
10/5/2006	Blindhorse - Petersburg	1		0	0	pool		30
10/5/2006	Blindhorse - Petersburg	2		1	0	pool		30
10/5/2006	Blindhorse - Petersburg	3		0	40	pool		29
10/5/2006	Blindhorse - Petersburg	4		0	20	pool		49
10/5/2006	Blindhorse - Petersburg	5	5	0	0	pool		15
10/10/2006	Blindhorse - Petersburg	1		0	10	none	n/a	
10/10/2006	Blindhorse - Petersburg	2		0	0	pool		5
10/10/2006	Blindhorse - Petersburg	3	3	0	5	pool		25
10/12/2006	East Fork Salmon R.	0	0	0	n/a	n/a	n/a	
10/12/2006	East Fork - Cecil Creek	1		0	10	none	n/a	
10/12/2006	East Fork - Cecil Creek	2		3	40	white water and pool		10
10/12/2006	East Fork - Cecil Creek	3		0	0	pool		15
10/12/2006	East Fork - Cecil Creek	4		0	45	ledge/ boulder		15
10/12/2006	East Fork - Cecil Creek	5		0	55	ledge/ boulder		4
10/12/2006	East Fork - Cecil Creek	6		0	59	wood, willows		2

10/12/2006	East Fork - Cecil Creek	7	7	2	45	pool		15
10/12/2006	Petersburg -	1		2	20	Boulder		40
10/12/2006	Petersburg -	2		2	90	bank slightly undercu		10
10/12/2006	Petersburg -	3		0	0	none	n/a	
10/12/2006	Petersburg -	4		0	1	boulder, wood		6
10/12/2006	Petersburg -	5	5	2	20	ledge/ pool		50
10/12/2006	Smith - Matthews	1		0	0	0	N/A	
10/12/2006	Smith - Matthews	2		0	0	0	N/A	
10/12/2006	Smith - Matthews	3		0	0	0	N/A	
10/12/2006	Smith - Matthews	4		0	0	0	N/A	
10/12/2006	Smith - Matthews	5	5	0	40	0	N/A	
10/12/2006	French - Smith	1		1	0	0		0
10/12/2006	French - Smith	2		0	20	0		20
10/12/2006	French - Smith	3		0	0	0		0
10/12/2006	French - Smith	4		0	0	0		0
10/12/2006	French - Smith	5		0	0	0		5
10/12/2006	French - Smith	6		0	0	0		0
10/12/2006	French - Smith	7		0	0	17		0
10/12/2006	French - Smith	8		1	0	0		1
10/12/2006	French - Smith	9		4	0	0		10
10/12/2006	French - Smith	10		0	0	0		10
10/12/2006	French - Smith	11	11	1	0	20		1
10/12/2006	Cecil - Limestone	1		3	70	pool		50
10/12/2006	Cecil - Limestone	2		0	5	w. water		15
10/12/2006	Cecil - Limestone	3		6	0	w. water		40
10/12/2006	Cecil - Limestone	4	4	1	75	w. water		8
10/12/2006	Little S. Fork - Blindhorse	0	0	0	N/A	N/A	N/A	
10/12/2006	Blindhorse - Petersburg	1		0	20	none	n/a	
10/12/2006	Blindhorse - Petersburg	2		0	0	none	n/a	
10/12/2006	Blindhorse - Petersburg	3	3	1	10	none	n/a	
10/13/2006	Idlewild - Whites	1	1	2	50	white water/ pool	10ft/ 25 ft	
10/13/2006	North Fork mile 16-14	1		1	0	boulder		1
10/13/2006	North Fork mile 16-15	2		0	0	boulder		3
10/13/2006	North Fork mile 16-16	3	3	4	0	boulder		2
10/13/2006	Sawyers Bar - Kelly Gl	1		0	5	pool		55
10/13/2006	Sawyers Bar - Kelly Gl	2		0	0	boulder		40
10/13/2006	Sawyers Bar - Kelly Gl	3	3	3	15	none	n/a	
10/13/2006	Whites to 16 mile	1		0	0	Boulder		3
10/13/2006	Whites to 16 mile	2		0	0	Boulder		3
10/13/2006	Whites to 16 mile	3	3	0	0	none	n/a	
10/17/2006	Little South Fork - Blindhorse	1		0	0	w. water		20

10/17/2006	Little South Fork - Blindhorse	2	2	0		0	pool	30
10/18/2006	Big Creek - Mule Bridge	0	0	0	n/a	n/a	n/a	
10/18/2006	Mule Bridge - Idlewild	1		0		5	wood	8
10/18/2006	Mule Bridge - Idlewild	2		1		35	boulder	6
10/18/2006	Mule Bridge - Idlewild	3	3	0		35	boulder	6
10/18/2006	Idlewild - Whites	1		0		1	none	n/a
10/18/2006	Idlewild - Whites	2		0		0	pool	65
10/18/2006	Idlewild - Whites	3		0		5	pool, ledge	50
10/18/2006	Idlewild - Whites	4		0		20	pool, ledge	45
10/18/2006	Idlewild - Whites	5		0		10	pool, ledge	40
10/18/2006	Idlewild - Whites	6	6	0		0	pools	40
10/19/2006	Petersburg - Eastfork	1		0		40	pool	10
10/19/2006	Petersburg - Eastfork	2		0		45	pool	15
10/19/2006	Petersburg - Eastfork	3	3	1		20	n/a	n/a
10/19/2006	East Fork	1		0		20	boulders	20
10/19/2006	East Fork	2	2	0		0	pool	20
10/19/2006	East Fork - Cecilville	1		0		50	w. water	8
10/19/2006	East Fork - Cecilville	2		1		45	pool	20
10/19/2006	East Fork - Cecilville	3		0		45	pool	20
10/19/2006	East Fork - Cecilville	4		0		45	pool	20
10/19/2006	East Fork - Cecilville	5	5	0		40	undercut willows	10
10/19/2006	Cecil - Limestone	0	0	0	n/a	n/a	n/a	
? 10/15 or 9,	Smith Creek - Matthews	1		0		5	undercuts + pool	15-20 / 50f
? 10/15 or 9,	Smith Creek - Matthews	2		1		40	pool	20
? 10/15 or 9,	Smith Creek - Matthews	3		0		35	pool	40
? 10/15 or 9,	Smith Creek - Matthews	4		0		35	pool	40
? 10/15 or 9,	Smith Creek - Matthews	5	5	0		35	pool	40

Total redds surveyed_____	190
# spring Chinook observed on redds_____	168
Total spring Chinook observed_____	553
Miles surveyed:	
Days Surveyed:	12
Total Surveys conducted (1 reach on 1 day = 1 survey)	44
# of reaches:	16

Enhanced Y/N	Habitat Type (pool, riffle, run,)	Spawning Area Available (L x W)	Spawning Area Used (L x W)	G.P.S. Reference #	Comments:	total # of Spring Chinook
No	top of Riffle	20x10	15x5	N/A	pool above redd w/ 7 k.s., 2 sthd	13
No	riffle	12x10	10x4	RB 1		
no	riffle	30x30	20x12	RB 2		
no	riffle	25x15	9x4	RB3		
No	riffle	50x30	12x6	RB4		24
no	run	12x5	4x3	n/a		33
n/a	n/a	n/a	n/a	n/a		5
no	run	30x3	15x3	RA 1	marginal; some cobble	
no	pool	9x5	9x5	RA 2		
no	run	9x4	9x4	RA 3	same habitat as redd #4	
no	run	8x4	8x5	RA 4		
no	run	17x4	7x4	RA 5		
no	pool	12x3	10x3	RA 6		
no	run	22x6	12x6	RA 7		
no	pool	25x6	12x6	RA 8	same habitat as redd #9	
no	run	25x6	10x5	RA 9		
no	run	16x4	8x4	RA 10		9
Yes	run	20x10	8x4			
No	run	6x4	6x4			
No	riffle	7x3	7x3			8
No	riffle	60x25	12x4		only made it to slightly past mile marker	17
no	riffle	60x25	11x5			
no	riffle	60x20	11x4			16
no	run	25x40	5x10		nice redd	
no	pool tailout	10x20	4x7			
no	riffle	19x5	12x5			5
No	run	20x4	18x4		first four all together, not very nice redd	
No	run	20x4	18x4		not protected not defined	
No	run	20x4	18x4		all sideways - 1 lrg. Redd	
No	run	20x4	18x4			
No	riffle	4x3	3x3		small redd	
No	riffle	14x4	7x3			
No	riffle	14x4	7x4			
No	run	20x4	3x4			
No	riffle	20x20	10x3			
No	run	15x15	6x3			
No	pool/riffle	4x4	4x4			
No	run	7x5	5x3		out of flagging	
No	run	3x2	3x2			

No	run	20x20	10x5		maybe 2 redds	
No	run	15x15	5x3			5
No	run	3x3	4x3		* recruitment of gravel at mouth of Little Grizzly unfinishe	
No	run	4x2	2.5x2			
No	run	8x3	3x3		deep	
No	pool	16x5	16x4		at horseshoe bend	
No	pool	3x3	2x1		small	
No	pool	12x5	5x3			
No	run	30x5	10x3			
No	run	30x5	6x4			
No	run	9x3	5x2			
No	pool	5x2	3x2			
No	run	5x3	4x3			21
no	run	20x4	5x4			9
no	run	30x20	18x8	RB 1		
no	riffle	16x7	15x5	RB 2		
no	tailout	25x15	12x5	RB 3		
no	run	15x5	15x5	RB 4		
no	run	40x18	10x5	RB 5		
no	run	10x4	10x4	RB 6		
no	riffle	40x30	10x6	RB 7		
no	riffle	35x15	12x5	RB 8		
no	riffle	30x20	9x5	RB 9		57
No	riffle	50x15	8x3	RB 1		
No	riffle	50x15	5x3	RB 2		
No	riffle	10x4	10x4	RB 3		
No	run	10x3	8x3	RB 4		
No	riffle	20x10	8x3		(not enough satellites	
No	riffle	10x3	7x3	RB 5	saw an additional 10 spch	17
No	run	60x30	15x6	RA 1		
no	run	60x30	20x5	RA 1		15
no	run	5x10	5x8			
no	run	20x5	20x5		3 redds, 6 fish; nice pool	
no	run	20x5	20x5			
no	run	20x5	20x5			
no	run	8x10	6x7		8 lives in pool upstream	
no	riffle	5x6	5x5			
no	riffle	5x5	5x5			
no	riffle	5x7	5x7			
no	riffle	10x5	8x5			22
No	pool	40x12	15x6	RI 1	more or less 99 ft	
no	pool	15x6	15x3	RI 2	redd not complete	
No	pool tail-ou	15x5	13x5	RJ 01	no GPS point	
No	run	35x20	15x8	RJ 02		

No	riffle	20x7	18x5	RJ 03			5
No	tailout	20x10	12x8	RC 01			
No	pool tailout	25x20	8x4	RC 02			
No	riffle	25x25	20x10	RC 03			
No	riffle	20x5	15x4	RC 04			25
No	Riffle	5x6	8x8				
No	Pool	15x6	6x3			Same Location as redd #3	
No	Pool	15x6	3x2				
No	Riffle	8x9	8x6				17
No	run	25x6	9x4				
No	run	8x4	3x3				
No	pool	? Too deep	4x3			deep	
No	pool	20x4	4x3				
No	pool	12x6	8x4			Cecil	
No	riffle	5x3	5x3			Crawford	
No	run	8x3	2x2			Crawford	
No	riffle	25x4	6x3			Andy's	
No	riffle	25x4	4x3			Andy's	
No	run	16x4	10x3				
No	run	10x4	5x3				
No	run	12x5	8x4				
No	run	20x5	10x4			Bridge	
No	run	16x4	10x4				
No	pool	20x6	10x6			St. Claire	
No	pool	40x6	8x3				
No	run	12x6	8x5				58
No	Run	12x5	9x4		38	multi-fish fight on the next sight up-river	
No	Run	5x3	7x5		39		
No	Run	10x5	5x4		47		2
No	Riffle	30x30	12x5	RB 01			
No	run	20x10	10x4	RB 02			
No	run	20x8	15x6	RB 03			
No	run	20x6	14x4	RB 04			
No	run	30x30	12x5	RB 05			49
No	riffle	12x5	12x5	RB 01			
No	riffle	10x15	10x4	RB 02			
No	riffle	25x10	20x8	RB 03			10
n/a	n/a	n/a	n/a	n/a		possibly one redd at the last priva	6
No	riffle	75x8	5x4				
No	run	30x8	10x5				
No	riffle/ run	30x15	11x7			beautiful redd!	
No	run	30x10	7x4			2 slightly old redds just called one	
No	run	25x20	15x10				
No	run	30x10	5x3				

No	riffle	40x6	10x5				8
No	riffle	20x5	5x3			steelhead?	
No	run	25x10	10x3				
No	riffle	30x15	4.5x2.5			small!	
No	run	11x5	7x4.5				
No	riffle	30x10	15x8			huge! Possilby multiple redds	7
No	riffle	40x20	12x7		49	1-4 in same large riffle	
No	riffle	40x20	14x5		49		
No	riffle	40x20	12x5		49		
No	riffle	40x20	12x5		49	3 & 4 next to each other	
No	run	25x10	25x10		50		0
No	riffle	30x20	16x8	RE01			
No	riffle	30x30	20x15	RE02			
No	riffle	15x15	30x15	RE03			
No	riffle	30x12	25x5	RE04			
No	riffle	20x10	18x6	RE05			
No	riffle	20x30	10x6	RE05			
No	riffle	40x30	20x8				
No	pool	15x20	10x14				
No	riffle	30x15	15x6	RE09		L Bank	
No	riffle	15x5	10x3	RE09		R Bank	
No	riffle	50x30	20x7				17
No	riffle	30x10	16x5	RX01			
No	riffle	30x15	15x8	RD02			
No	riffle	12x6	8x5	RD02			
No	riffle	15x20	15x8	CD02			45
N/A	N/A	N/A	N/A	N/A			4
No	run	3x3	3x2			by trailhead parking lot	
No	pool	8x3	5x3			just below parking lot	
No	pool	6x4	3x2			between bridges	4
no	riffle	10x10	8x5				14
Yes	pool tailout	30x40	4x8				
Yes	pool tailout	25x60	3x6				
Yes	riffle	20x30	4x14			Below Bridge	5
no		30x10	4.5x5			smaller but rounded	
no	glide	100x10	7x4				
no	glide to riffl	50x20	10x5.5			not sure if completed	7
no	run	200x25	8x5			gorge	
no	pool	20x20	3x4				
no	pool/ riffle	20x20	3x1.5				0
no	riffle	12x4	10x3	RA01			

no	pool tailout	25x7	18x4	RA02		1
n/a	n/a	n/a	n/a			0
No	Pool	20x20	5x4			
No	Run	20x10	10x5			
No	Run	25x10	10x10			2
no (mining)	riffle	7x4	6x2.5		in a mound of smallish mine tailings, by large dredge ho	
No	glide	13x6	6x4		just below confluence with russians	
No	glide	40x15	10x4			
No	glide	40x15	7x3.5			
No	glide	40x15	6x3			
No	riffle	13x5	9x4			0
No	run	15x7	7x5			
No	run	15x7	7x5			
No	riffle	8x5	5x3			1
No	riffle	7x4	6x4			
No	riffle	30x15			two redds in same location, 1 pre	0
No	riffle	6x5	6x3			
No	PTC	20x15	9x5			
No	PTC	20x15	7x3			
No	PTC	20x15	8x4			
No	riffle	15x7	8x4			5
n/a	n/a	n/a	n/a			0
No		6x7	6x7			
No		10x7	5x7			
No		30x10	15x8			
No		30x10	15x8			
No		30x10	15x8			2

ed look to redd- fresh bear evidence = possible predation?

le

Salmon to Trinity

Species	Life Stage	Run	Source	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Chinook	Redd Construction	Spring	Al Olson									Pa1	Pa1 Pa1		
		Fall	Al Olson										Pa1 Pa1	Pa1 Pa1	
		Winter													
	Egg Incubation to fry emergence	Spring	Al Olson	Pa2 Pa2	Pa2 Pa2	Pa2 Pa2	Pa2 Pa2	Pa2 Pa2							
		Fall													
		Winter													
	Fry Rearing (up to 50 mm)	Spring	Al Olson				Pa2 Pa2	Pa2 Pa2	Pa2 Pa2	Pa2					
		Fall	Charlie Chamberlain	U U	U U	U U		Pa1					Pa1		
		Winter													
	Juvenile YOY rearing (>50 mm)	Spring	Al Olson				Pa2	Pa2 Pa2	Pa2 Pa2	Pa2 Pa2	Pa2 Pa2	Pa2 Pa2	Pa2 Pa2	Pa2 Pd2	Pd2 Pd2
		Fall													
		Winter													
	Juvenile yearling rearing	All	Al Olson	Pd2 Pd2	Pd2 Pd2	Pd2 Pd2									
	Juvenile emigration (>50mm)	All	Al Olson	Pd2 Pd2	Pd2 Pd2	Pd2 Pd2	Pd2 Pa2	Pa2 Pa2	Pa2 Pa2	Pa2 Ma2	Pa2 Pa2	Pa2 Pa2	Ma2 Ma2	Pd2 Pd2	Pd2 Pd2
			Charlie Chamberlain	U U	U U	Pa2 Pa2 Pa4	Pa2 Pa2 Pb3 Pb3 Pa4 Pa4	Pa2 Ma2 Pb3 Pb3 Pa4 Pa4	Ma2 Ma2 Mb3 Mb3 Ma4 Ma4	Ma2 Pa2 Pb3 Pb3 Ma4 Pa4	Pa2 Pa2	Pa2 Pa2	Pa2 Pa2	Pa2 Pa2	Ma2 Ma2
	Adult migration	Spring	Al Olson				Pa3 Pa3	Pa3 Pa3	Pa3 Pa3						
		Fall													
		Winter													
	Adult holding	Spring	Al Olson						Pa? Pa?	Pa? Pa4	Pa4 Pa4	Pa4			
		Fall													
		Winter													
Coho	Redd Construction	All	Al Olson											Pa4	Pa4
	Egg Incubation to	All	Al Olson	Pd8 Pd8	Pd8 Pd8	Pd8 Pd8	Pd8 Pd8							Pd8	Pd8 Pd8
	Fry Rearing (up to	All	Al Olson						Pa5 Pa5	Pa5 Pa5	Pa5 Pa5	Pa5 Pa5	Pa5 Pa5		
	Juvenile YOY	All	Al Olson							Pa4 Pa4	Pa4 Pa4	Pa4 Pa4	Pa4 Pa4		
	Juvenile emigration (>50mm)	All	Charlie Chamberlain			Pa2 Pa2 Pa4 Pa4	Pa2 Pa2 Pa4 Ma4	Pa2 Pa2 Ma4 Ma4	Pa2 Pa4 Ma4	Pa4					
	Adult migration	All	Al Olson											Pa4 Pa4	
	Adult holding	All	Al Olson										Pa4	Pa4	
Coastal Cutthroat	Redd Construction	All													
	Egg Incubation to fry emergence	All													
	Fry Rearing (up to 50 mm)	All													
	1+ rearing (>50 mm)	All													
	2+ rearing (>130 mm)	All													
	Juvenile emigration (>50mm)	All													
	Adult migration	All													
	Adult holding	All													
	Runback emigration	All													

Salmon to Trinity

Species	Life Stage	Run	Source	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Steelhead	Redd Construction	Summer	Al Olson		Pd6 Pd6										
		Fall													
		Winter	Al Olson			Pd6 Pd6	Pd6 Pd6								
	Egg Incubation to fry emergence	Summer	Al Olson		Pd8 Pd8	Pd8 Pd8	Pd8 Pd8	Pd8 Pd8	Pd8 Pd8	Pd8 Pd8					
		Fall													
		Winter													
	Fry Rearing (up to 50 mm)	Summer													
		Fall	Charlie Chamberlain			Aa4	Pa4 Pa4	Pa4 Pa4	Ma4 Ma4	Ma4 Pa1 Ma4	Pa4				
		Winter	Al Olson						Pb6 Pb6	Pb6 Pb6	Pb6 Pb6	Pb6 Pb6			
	1+ rearing (>50 mm)	All	Al Olson	Pd8 Pd8	Pd8 Pd8	Pd8 Pd8	Pd8 Pd8	Pd8 Pd8	Pb6 Pb6	Pb6 Pb6	Pb6 Pb6	Pb6 Pb6	Pd8 Pd8	Pd8 Pd8	Pd8 Pd8
			Charlie Chamberlain			Pa4	Pa4 Ma4	Ma4 Pa4	Pa4 Pa4	Pa4 Pa1 Pa4	Pa4		Pa1		
	2+ and older rearing (>130 mm)	All	Al Olson	Pd8 Pd8	Pd8 Pd8	Pd8 Pd8			Pb6 Pb6	Pb6 Pb6	Pb6 Pb6	Pb6 Pb6			
			Charlie Chamberlain			Ma4	Ma4 Ma4	Ma4 Pa4	Pa4 Pa4	Pd Pa1			Pa1		
	Juvenile emigration (>50mm, all ages)	All	Charlie Chamberlain			Pa2 Ma2 Pa4	Ma2 Ma2 Mb3 Mb3 Pa4 Ma4	Pa2 Pa2 Mb3 Pb3 Ma4 Ma4	Pa2 Pa2 Pb3 Pb3 Ma4 Pa4	Pa2 Pa2 Pb3 Pb3 Pa4 Pa4					
	Adult migration	Summer													
		Fall													
		Winter													
	Adult holding	Summer	Al Olson	Pd8 Pd8	Pd8 Pd8				Pa4 Pa4	Pa4 Pa4	Pa4 Pa4	Pa4 Pa4	Pa4 Pa4	Pa4 Pa4	Pd8 Pd8
		Fall													
		Winter	Al Olson	Pd8 Pd8	Pd8 Pd8	Pd8 Pd8						Pa4 Pa4	Pa4 Pa4	Pa4 Pa4	Pd8 Pd8
	Half-pounder migration and holding	All	Al Olson									Pa4 Pa4	Pa4 Pa4	Pa4 Pa4	Pd8 Pd8
	Runback emigration	All	Al Olson		Pb7 Pb7	Pb7 Pb7	Pb7 Pb7	Pb7							
Grean Sturgeon	Spawning	All													
	Egg Incubation	All													
	Juvenile rearing	All													
	Juvenile emigration	All	Charlie Chamberlain						Pa4 Pa4	Ma4 Ma4	Pa4				
	Adult migration	All													
	Adult holding	All							Pa3 Pa3						
Pacific Lamprey	Spawning	All						Pa3 Pa3							
	Egg Incubation	All													
	Juvenile rearing	All													
	Juvenile emigration	All	Charlie Chamberlain			Ma4	Ma4 Ma4	Ma4 Pa4	Pa4 Pa4	Pa4 Pa4					
	Adult migration	All													
	Adult holding	All													

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December 3, 2009

Mark Stopher
California Department of Fish and Game
601 Locust Street
Redding, CA 96001

Re: Comments on the Department's Notice of Preparation of a Draft Subsequent Environmental Impact Report Regarding Suction Dredge Mining Rules

Dear Mr. Stopher:

The Sierra Fund is pleased to make the following comments on the Notice of Preparation of a Draft Subsequent Environmental Impact Report (SEIR) regarding suction dredge mining rules.

The Sierra Fund is a nonprofit community foundation, with the mission to increase and organize investment in the natural and human resources of the Sierra Nevada. Since 2006, The Sierra Fund has been working to bring more attention to the environmental and health impacts of historic mining, through our Mining Initiative which is based upon recommendations from our 2008 report entitled *Mining's Toxic Legacy*. (The full report can be viewed on our website www.sierrafund.org/campaigns/mining). We are currently engaged in a Sierra-wide effort to raise public awareness of the problems presented by abandoned mines, mine waste piles, mercury, and other toxins left over from mining in the region, and to involve all stakeholders in designing workable solutions to these problems.

We joined with a number of other organizations in developing collaborative comments on the SEIR, outlining a number of other comments and recommendations for changes. These comments, which are being submitted by the Karuk Tribe and large coalition of organizations, reflect our concerns as well.

In addition, we are here submitting comments focusing on mercury issues that are pertinent to the SEIR. The following comments about the technical elements of the SEIR that address mercury hazards have been developed in large part by The Sierra Fund's Science Director, Carrie Monohan, Ph.D. (see Vitae, attached).

We believe that the broadest interpretation should be made of the scope of the SEIR that was ordered by the California court. Since "new information, which was not known and could not have been known at the time the [original] environmental impact report was certified as complete has become available" (Public Resources Code 21166 (c)) concerning the deleterious and cumulative impact of suction dredge gold mining, the scope of the SEIR must respond to this new information, especially around Air Quality, Biological Resources, Hazards and Hazardous Materials, and Water Quality and Toxicology. We outline some of this new information in the following comments. Our comments on the SEIR are focused on specific changes in the SEIR Environmental Check List that we would like to see adopted.

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Comment #1: The Air Quality discussion inadequately characterizes the potential air quality impacts of suction dredging by failing to discuss the impact of mercury that is retorted as part of gold recovery.

The SEIR in section 5.5.7 Processing of Material states:

> Generally, the sluice box does not need to be cleaned until gold is beginning to be deposited below the upper third of the box ...Normal conditions require that the sluice box be cleaned only once or twice per day... The concentrates are filtered through a series of screens and/or panned to work the concentrates down to small batches containing gold, which then can be processed through a final dry process... This final procedure involves the drying of concentrates, filtering, and physical separation using magnets and small hand tools. In addition, chemical separation, by means of mercury and nitric acid, may be used for the amalgamation process...After the mercury has gathered in the gold, it is removed by dissolving it in nitric acid or by driving it off as a vapor by heat, leaving the gold behind. While mercury should be treated as a hazardous waste, some miners collect and store it, while others dispose of it by vaporizing it in a cooking pan on a camp stove.

Despite this information, which clearly points out that mercury is allowed to vaporize into the atmosphere at suction dredge mining operations, and a great deal of public testimony that mercury vapor is commonly released on-site as a part of routine suction dredging for gold, there is no mention in the air quality environmental checklist about this practice or its air quality impacts.

Mercury vapor releases have been acknowledged as a significant air quality impact. Mercury discharges into air are regulated by the Clean Air Act. The Clean Air Act regulates 188 air toxics, also known as "hazardous air pollutants." Mercury is one of these air toxics. The Act directs the EPA to establish technology-based standards for certain sources that emit these air toxics. Those sources also are required to obtain Clean Air Act operating permits and to comply with all applicable emission standards.

Mercury is very dangerous when inhaled. Acute exposure to mercury vapor leads to pulmonary and central nervous system effects. Inhalation of high levels of mercury vapor can cause the onset of symptoms such as cough, dyspnea, chest pain, nausea, vomiting, diarrhea, fever and a metallic taste in the mouth. These symptoms can progress to interstitial pneumonitis and pulmonary edema. Young children are at the greatest risk of developing pulmonary toxicity.

Recommendation: The acknowledged common practice of retorting mercury on-site as part of routine processing of materials from suction dredge mining has a potentially significant impact on air quality and public health and must be analyzed further in the SEIR.

Comment #2: The Biological Resources checklist understates the problems of heavy metal contamination on fish embryos and the stream benthic community.

Water quality sustains ecological processes that support fish populations, vegetation, wetlands, and birdlife. Water quality is the building block of the aquatic food chain and the impacts of mercury pollution can be seen in fish and birds that depend on aquatic food chain for their food source. Suction dredge mining in waterways with residual mercury has irreversible and long lasting deleterious effect to the environment and to fish because it degrades water quality.

Mercury takes on different forms in the environment. Quicksilver or elemental mercury is a visible form. Methyl mercury is a particularly toxic form that bioaccumulates in the food chain. Mercury can also be present in the air and water in particles too small to see. The microscopic particles of mercury in the water are deleterious to the entire aquatic food chain because they are easily accessed by bacteria.

Bacteria will use mercury and in so doing create methyl mercury. Specifically, sulfur reducing bacteria in warm anoxic environments will reduce mercury and create methyl mercury. Bacteria form the bottom of the food chain. If the bottom of the food chain is polluted with mercury then that contamination is translated to every level of the food chain.

The impacts of methyl mercury contamination in the aquatic food chain are still being studied. However as methyl mercury moves up the food chain it bio-accumulates and biomagnifies and can be found at very high levels in large predatory fish such as bass (USGS Open File Report 00-367, 1999). The Water Board Staff report of May 2005 concludes that the recreational suction dredge that was tested recovered 98% of the mercury it disturbed, but that the mercury concentrations in the fine and suspended sediment in the dredge effluent were more than ten times higher than that needed to classify it as a hazardous waste. This report also states that the floured mercury in fine sediment and mercury attached to clay particles in suspended sediment that were released by the dredge can be carried by the river to environments where mercury methylation occurs (Humphreys, 2005).

In the section on heavy metal contamination the report notes that:

> Suction dredging activities can result in the discharge of mercury (Hg) or other toxic contaminants. These discharges may cause adverse impacts to aquatic organisms and increase the risk of mercury bioaccumulation in the food chain. Strong experimental evidence exists for the adverse effects of mercury on fish reproductive capacity (e.g., decline in spawning activity and fecundity, impaired gonadal development, or testiticular atrophy) (Kirubagaran and Joy 1988; Wester 1991; Kirubagaran and Joy 1992; Friedmann, et al. 1996; Hammerschmidt et al. 2002). This is considered a potentially significant impact and will be analyzed further in the SEIR.

Unfortunately, the environmental checklist only refers to this problem affecting juvenile and adult fish. Despite evidence that mercury contamination affects the entire food chain and gets into the tissues of all organisms that are exposed, there is no discussion on the impacts of this exposure of fish embryos.

Further, the checklist states that effects of dredging on stream benthic community are localized, in that they do not extend beyond the immediate area dredged. This disregards the impact of mobilized, reactive mercury on stream benthic community at a distance from the dredging site.

We can find no studies specifically designed to determine if suction dredging contributes to high fish tissue mercury levels. Also, we can find no studies that have been performed to determine whether or not suction dredging affects levels of mercury or methyl-mercury in biota on-site or downstream of dredging operations. These studies need to be done to determine the effect that recreational suction dredge mining has on mercury in fish tissues, and the extent to which this effect extends to downstream environments. No recreational suction dredge mining in the Gold County should be allowed until these questions can be answered.

Recommendation: Reactive mercury that has been mobilized by suction dredge mining has potentially significant impacts on fish embryos and stream benthic communities. These impacts must be studied and analyzed further in the SEIR.

Comment #3: The Hazards and Hazardous Materials checklist fails to discuss fully the potential hazards of mercury both used and recovered by suction dredge miners.

In the discussion of hazards, the SEIR does describe some potential hazards associated with nitric acid and mercury, stating that when these materials are used or disposed of "improperly", they may

> ...pose a risk to public health and safety from contamination or exposure. This includes accidental or purposeful spillage into waterways and/or upland areas. Because suction dredging and related activities are associated with the routine use of hazardous materials, the implementation of the Program could potentially endanger the health of the public or the environment.

The SEIR should not only focus on "improper" disposal of mercury, but must instead look at every way that mercury in the suction dredge process is handled, including storage on-site, transportation of the material to and from the site, how mercury is applied and retorted, and how it is disposed of.

Mercury is a highly toxic material, and is regulated under Proposition 65 and numerous other statutes. If a blood pressure cuff breaks in a doctor's office spilling mercury, a Proposition 65 warning is required including routine notification of the public through the newspaper of record, and emergency hazard response

professionals are called to the scene. Similar precautions need to be taken with mercury used in suction dredge mining operations.

There are two ways that mercury is part of suction dredge mining:

i. Use of "clean mercury" and nitric acid as part of the mining process: The use of nitric acid to process the concentrates creates a waste product, mercuric nitrate, that is water soluble, extremely acidic, and toxic to the environment. Mercuric nitrate is mercury that has been oxidized and is essentially one step closer to becoming methyl mercury. Mercuric nitrate is a hazardous waste that has been found in glass jugs in recreational suction dredgers' camps. Mercury that is brought to the suction dredge operation has the potential to introduce more mercury into the environment.

Mercuric nitrate is the substance responsible for "Mad Hatters" disease, a neurologic disorder associated with exposure to inorganic and organic forms of mercury. Chronic exposure to inorganic mercury manifests as mental confusion, prominent behavioral changes (including psychosis), and abnormal movement. Alkyl mercury poisoning may occur through ingestion of contaminated seafood or grain, and its characteristic features include vision loss, deafness and other neurological impacts. Exposure to mercury has been found to be particularly damaging to children, especially in the developing fetus. Acute intoxication may be associated with gastrointestinal disturbances, mental status changes, even death.

ii. Mercury recovered from creeks, rivers and other water bodies as part of the suction dredge mining process: An estimated 26 million pounds of mercury were used to extract gold from ore in California, most of it in the Sierra Nevada Gold Country (Alpers et al, 2005). Of this, an estimated 10 million pounds were lost to the environment in placer mining operations and another 3 million pounds were lost from hard rock mining (Churchill, 2000).

Elemental mercury or "quicksilver" is still commonly encountered in Sierra watersheds. In the suction dredging process, miners remove gravels from the riverbed with a suction hose powered by an engine, and then use pans or other methods to retrieve the gold. Suction dredgers often encounter mercury and gold-mercury amalgam, which tend to fall into the cracks of the riverbed like gold. Dredgers collect the mercury and amalgam, and retort it or treat it with nitric acid to release any gold that may have amalgamated with the mercury.

Recommendation: The hazards associated with nitric acid and mercury use as part of routine suction dredge gold mining including the handling, transportation, storage, use and disposal of mercury must be analyzed further in the SEIR.

Comment #4: The Hydrology and Water Quality section needs to be revised to address the many hazards associated with mercury and suction dredge gold mining.

The SEIR discussion about the impacts of suction dredge mining practices on mercury and water quality needs to be greatly expanded.

Under the Clean Water Act, states adopt water quality standards for their rivers, streams, lakes, and wetlands. These standards identify levels for pollutants, including mercury, which must be met in order to protect human health, fish, and wildlife. No person may discharge pollutants, including mercury, into waters unless the person has a permit.

The National Pollutant Discharge Elimination System (NPDES) is the permit system established by the Clean Water Act (CWA) to regulate direct wastewater discharges from wastewater treatment plants and industry. Wastewater dischargers may be required to comply with a specific mercury discharge limit (concentration and/or mass limit) or may only be required to monitor their discharges for mercury. Local discharge limits in California for mercury range from 0 to 0.1 ppm (or mg/l). The Total Maximum Daily Load (TMDL) is a calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards. TMDLs determine what level of pollutant load would be consistent with meeting water quality standards. The TMDL regulatory process also allocates acceptable loads among sources of the relevant pollutant.

A single recreational suction dredge operating 8 hours per day for 30 days disturbing 1-10sq/meters of stream bed in an area with a background concentration of mercury in the stream bed of 30ppb-1ppm would be responsible for mobilizing more mercury than the amount of mercury mobilized over the course of a dry water year for an entire watershed (Alpers, personal communication 12/2/09; CVWQCB 2008). NPDES permits have not been given to recreational suction dredgers nor have TMDLs been developed for the waterways in which recreation suction dredging currently takes place in California. As such, recreational suction dredging in areas with mercury contamination is likely in violation of the Clean Water Act.

Recreational suction dredging exacerbates the existing mercury contamination problems in water bodies and increases the levels of mercury contamination in fish for the following reasons:

- **Dredging exposes encapsulated mercury.** Suction dredge miners target deep river crevices where heavy materials including gold and mercury can be found because they have not been disturbed by natural processes for many years. Dredging these areas of "pay dirt" disturbs mercury that would otherwise have remained encapsulated.

- **Floured mercury is released back into the water body.** The Project Description of recreational suction dredging acknowledges the fact that miners encounter mercury when operating dredges. This does not address the fact that the mercury that is not captured by the dredge is instead floured by the dredge and re-released back into the water body in a form that is more likely to methylate and be incorporated into the food chain (RWQCB, 2005). The floured mercury that is released back into the water body has been changed by the dredging activity and is considered more likely

to methylate because as it travels through the intake hose, educator, and header box the mercury is disturbed and broken up into very small pieces. These small pieces, or floured mercury, are likely to be carried in suspension long distances from the dredging operation, and are readily available to bacteria because it is small (high surface area to volume ratio), oxygenated, and dispersed. The increase in surface area from changing large blobs of mercury to fine-grained floured mercury likely increases the rate of mercury oxidation. The oxidation of these fine mercury particles may be further enhanced by transport in an oxygenated water column of a flowing river. It is the oxidized mercury that is considered the "reactive" fraction that is most available to mercury-methylating bacteria.

- **Mercury travels downstream.** The mercury that is not captured by the dredge but is instead discharged into the water body travels downstream in suspension through varied and diverse habitats where it can be taken up by bacteria that live on the banks of the river and form floodplain wetland environments. The floodplain environment of upland rivers includes the entire 100 year floodplain because this is the area that is inundated by storm events when the rivers swell and overtop the banks. It follows that dredge effluent containing mercury deposited anywhere between the high water mark and the 100 year floodplain is likely to contaminate the aquatic food chain. The literature review states that:

  > Dissolved Hg, floured liquid Hg, and fine particle/colloid bound Hg may be transported long distances to environments favorable to methylation, e.g. wetlands, Yolo Bypass, or the Delta. It is well-known that methylation occurs in these environments (e.g., CVRWQCB 2008).

  In addition, it is important to note that mercury may not need to travel long distances to be methylated, in fact methylation is likely to occur in the hyporheic zone, in backwater channels and as benthic exchange in many carbon-rich, low-oxygen environments.

- **Recreational suction dredging takes place during the warm summer months of heightened biological activity.** Recreational suction dredges disturb and release mercury primarily in the summer months when the water is warm and the flows are low and there are an abundance of bacteria-rich environments where mercury methylation is likely to occur (Alpers et al., 2008; Stewart et al., 2008). Once mercury gets into fish it can result in impaired water body listings or 303(d) listings, and fish consumption advisories. There are numerous fish consumption advisories for fish in mercury impaired water bodies in the Sierra as a result of mercury contamination (OEHHA, 2009).

- **Further studies need to be done to understand mercury methylation.** The different environments, times of year and extent of mercury methylation has not been studied, nor have the effects of recreational suction dredging on methylation in these different environments. Until the areas with the

greatest mercury contamination and methylation potential are known it is prudent to not operate recreational suction dredges, otherwise the mercury contamination problem in California may worsen.

Recommendation: The effect of recreational suction dredging on water quality should be considered first and foremost among the impacts of the project. The impacts of disturbing and re-distributing mercury in the environment, on water quality, wildlife health and fish populations need to be fully analyzed in the SEIR.

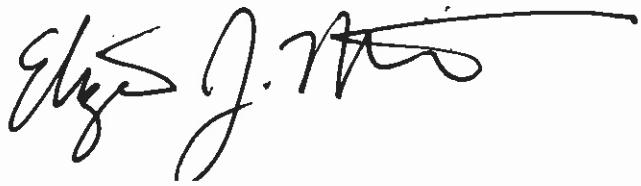
Comment #5: Many of the concerns raised in our comments about the SEIR are focused on public health, water and air quality and other issues outside of the charge of the lead agency.

The issues we raise in the above comments are in some cases outside of the jurisdiction of the California Department of Fish and Game, and are instead regulated by the State Water Resources Control Board, Department of Toxic Substances Control, and the California Air Resources Board. Their expertise and guidance is needed in this effort.

Recommendation: State agencies charged with protecting air and water quality must be part of the regulatory mechanism permitting suction dredge mining, and should be included in the development of the Environmental Impact Review as well as developing any new regulations or procedures promulgated as part of this effort.

In Conclusion
Thank you for this opportunity to comment. Please feel free to call if you have any questions about these materials.

Sincerely,



Elizabeth "Izzy" Martin
CEO
The Sierra Fund

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Central Valley Regional Water Quality Control Board *Amendments To The Water Quality Control Plan For The Sacramento River And San Joaquin River Basins For The Control Of Methylmercury And Total Mercury In The Sacramento-San Joaquin Delta Estuary,* Staff report Draft report for Public review February 2008)

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Key Qualifications

Dr. Monohan received her Ph.D. from the University of Washington College of Forest Resources, Center for Water and Watershed Studies. Her dissertation work addressed the relationship between water quality in agricultural streams and diminishing salmon habitat. Since completing her dissertation she has contributed to the scientific and regulatory communities' understanding of the legacy impacts from historical gold mining in California, specifically, the effects of mercury, the process of mercury methylation and potential human exposure routes.

EDUCATION:

2004 Ph.D. Forest Engineering and Hydrology, College of Forest Resources, Center for Waterand Watershed Studies, University of Washington, Seattle, Washington. USA Multi-disciplinary degree with emphasis on water quality.

2000 B.Sc. (Honors), Biology, Robert D. Clark Honors College, University of Oregon, USA

RELATED POSITIONS HELD:

2007-date *Science Director, The Sierra Fund, Nevada City, CA*
Director of Science for the Mining Project Initiative to address legacy mining issues across the Sierra Nevada mountain range, issues include both human exposure routes and environmental degradation.

2008-date *Consulting Scientist, The Nevada Irrigation District, Grass Valley, CA*
Development, design, and permitting of a reservoir sediment and mercury removal project.

2006-2009 Consulting *Hydrologist, Friends of Deer Creek, Nevada City, CA*
Position is the project manager for a US Environmental Protection Agency funded Brownfield Project.

2004-2008 *Senior River Scientist, The Natural Heritage Institute.100 Pine St. Suite 1550, San Francisco, CA 94111* Project manager for the development of a Mountain Meadows Integrated Regional Watershed Management Plan and development of environmental flow targets for the Sacramento and Feather Rivers.

SELECTED TECHNICAL REPORTS AND PAPERS:

Monohan, C. and J. Cain. 2008 Estimating Environmental Flow Objectives for the Sacramento and Feather Rivers. Report produced for the Conjunctive Use Integrated Regional Watershed Management Plan. Submitted to the Department of Water Resources.

Henson S., C. Monohan and J. Hild. 2008. Deer Creek Watershed Mercury Survey. Submitted to the Regional Water Quality Control Board, Total Maximum Daily Load Unit.

Cornwell, Kevin, K. Brown, and C. Monohan 2007. Mountain Meadows and their contribution to the Sierra Nevada Water Resources. EOS Trans. AGU, 88(52) Fall Meet. Suppl. Abstract H31D-0642.

Monohan, C. 2007, Principal Science Advisor and co-author of *Mining's Toxic Legacy: An Initiative to Address Mining Toxins in the Sierra Nevada,* published March 2008 by The Sierra Fund

Soderstrom, E., M. Connor, J. Cohen, and C. Monohan 2005. Citizen Monitoring and Adaptive Management Handbook. Volume 1 Citizen Monitoring Essentials, Volume 2 From Data to Action: Interpretation, Analysis, Presentation and Use of Monitoring Data. Produced by The South Yuba River Citizens League and the Natural Heritage Institute.

Doctoral Dissertation, Nov 2004. Monohan, C. 2004, Riparian Buffer Function with Respect to Nitrogen Transformation and Temperature Along Lowland Agricultural Streams in Skagit County, Washington

Riparian Restoration Design, Feb 2003-June 2003. Monohan, C. 2003. Fish Friendly Landscape Design for Riparian Areas on Private Land. Submitted to City of Bellevue and Adolfson and Associates

White Paper, June 2001. Monohan, C. and S. Bolton. 2001. A Review of the Literature and Assessment of Research Needs in Agricultural Streams in the Pacific Northwest as it Pertains to Freshwater Habitat for Salmonids. Submitted to Snohomish, King, Skagit and Whatcom Counties, WA

NMFS Technical Report, October 2001. Riley, S., P. Kiffney, and C. Inman. 2001. Habitat inventory and salmonid stock assessment in the Cedar River and tributaries. Submitted to Seattle Public Utilities

Graduate Fellowship Grant for National Science Foundation, Fall 2000. Inman, C. 2000. Riparian Functional Types Response to Nitrogen Loading: Retention Mechanisms. Honorable Mention

Honors Senior Thesis Research, Summer 1999- Spring 2000. Inman, C. The Effect of Ultraviolet Radiation on Cyanobacterial Matt Community Structure. Yellowstone National Park. Ecology and Evolution Department. University of Oregon. Eugene, OR.

Independent Study, Fall 1997. Inman, C. A Fish Biodiversity Study in a Flood Plain Habitat of the Okavango Delta. Heil Openheimer Okavango Research Center. School for International Training. Botswana, Africa.

Elizabeth J. Martin
Chief Executive Officer
The Sierra Fund
432 Broad Street
Nevada City, CA 95959
(530) 265-8454 x11

Ms. Martin has years of experience in evaluating environmental impact reports as a decision maker on local government boards. In addition, she has developed nationally recognized expertise in the impacts of mercury from legacy gold mining, including being asked to serve as an expert witness in Congressional Hearings held in November 2009 on the issue of abandoned mines and mercury in California.

RELATED EXPERIENCE

CEO The Sierra Fund	December 2004 - present
Nevada County Supervisor, District 4 Nevada County, California	January 1999 - January 2003
Nevada County Planning Commissioner Nevada County, California	1991 – 1993, again from 1996 - 1998

EDUCATION

B.S, Environmental Policy Analysis, magna cum laude, UC Davis 1979

RELATED LEADERSHIP POSITIONS

Chair, Nevada County Board of Supervisors, 2001
Nevada Power Authority, 2001 - 2002
Nevada County Local Area Formation Commission 1999 - 2003
Nevada County Solid & Hazardous Waste Commission 1999 – 2003
Chair, Nevada County Planning Commission, 1996
Sierra Nevada Working Group, Resources Agency 2000 - 2002

SELECTED PUBLICATIONS

Principal Author, *Mining's Toxic Legacy: An Initiative to Address Mining Toxins in the Sierra Nevada,* published March 2008 by The Sierra Fund

Vulcan
Materials Company

December 3, 2009

Western Division

Mr. Mark Stopher
Department of Fish and Game
601 Locust Street
Redding, CA 96001

Re: Comment on Scope of Suction Dredging Permitting Program Subsequent Environmental Impact Report and Related Regulations

Dear Mr. Stopher:

We appreciate this opportunity to comment on the scope of the Department of Fish and Game's (DFG) subsequent environmental impact report (SEIR) for its suction dredging permitting program under California Fish & Game Code Section 5653.

Vulcan Materials Company conducts mining operations to extract raw materials that it then converts into aggregates and other products, such as asphalt, ready-mixed concrete and cement, the basic material used to construct infrastructure and public works projects. We take very seriously our obligation to be stewards of the environment and its resources, a commitment that is reflected at the core of our corporate mission and demonstrated by, among other things, our many projects to restore habitat for protected and endangered species in such places as Colton Dunes, Cajon Creek, Azusa Rock and the San Joaquin River Valley.

We support DFG's efforts to update its suction dredging permitting program. Like DFG, we are concerned that suction dredging operations that do not undergo environmental review - such as those conducted by individual goldminers - may pose a threat to fragile fish populations not presently accounted for under the existing program. It was this concern that motivated the Legislature to enact Fish & Game Code Section 5653.1, which imposes a moratorium on suction dredging for instream mining purposes until DFG completes its environmental review and updates its regulations.[1] So that the moratorium and DFG's SEIR and rulemaking process do not indirectly impede projects with restorative value and those for which there is an obvious critical need, it is imperative that DFG's SEIR be properly scoped so that is can proceed expeditiously. To that end, DFG's SEIR should be confined to an analysis of suction dredging operations that escape environmental review under other state and federal laws.

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[1] Please see Attachment A discussing the legislative and related history for Section 5653.1.

3200 SAN FERNANDO ROAD • LOS ANGELES, CALIFORNIA 90065-1415 • TELEPHONE 323 258-2777

I. THE MORATORIUM DOES NOT APPLY TO RESTORATION AND MAINTENANCE PROJECTS, AND THE SEIR ANALYSIS SHOULD NOT INCLUDE SUCH PROJECTS

The scope of DFG's SEIR and rulemaking should be focused on those instream mining operations contemplated by the moratorium.

The moratorium legislation specifically states that it:

> *Applies only to vacuum and suction dredging activities conducted for instream mining purposes. This section does not expand or provide new authority for the department to close or regulate suction dredging conducted for regular maintenance of energy or water supply management infrastructure, flood control, or navigational purposes governed by other state or federal law.* Fish & Game Code Section 5653.1.

Thus, the moratorium only applies to suction dredging for instream mining purposes and does not reach projects with restoration, maintenance, or navigation purposes. To the extent materials extracted for such projects also have financial value (which may help fund the project), such projects are nevertheless outside the reach of the moratorium. As reflected in the language of the moratorium quoted above, the real concern is that some instream mining operations are not otherwise governed by state and federal law and therefore may not be subject to appropriate environmental review. The SEIR's focus should be on these operations only.

II. THE SCOPE OF THE SEIR SHOULD FOCUS ON SUCTION DREDGING OPERATIONS NOT OTHERWISE SUBJECT TO ENVIRONMENTAL REVIEW

A. An unnecessarily overbroad SEIR scope could delay or increase the environmental or financial costs of good projects

This month Governor Schwarzenegger signed into law a historic package of water legislation aimed at addressing the state's water crisis.[2] Among other things, the legislation provides for an $11.1 billion water bond to fund water storage ($3 BB), Delta restoration ($2.55 BB), restoration in 21 watersheds other than the Delta ($1.7 BB), regional water management ($1.4 BB), groundwater cleanup ($1 BB), and water infrastructure projects. For some of these projects, suction dredging will be the best technology to use. Moreover, although Section 5653.1 specifically excepts from the prohibition suction dredging "conducted for regular maintenance of energy or water supply management infrastructure, flood control, or navigational purposes governed by other state or federal law," it is not clear that all of these projects will fall within the scope of the exception.

Therefore, to the extent DFG's SEIR and rulemaking process is protracted, and the suction dredging moratorium cannot be lifted, DFG's process could indirectly escalate the costs of or effectively stymie these much-needed projects by eliminating suction dredging as an

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2 Gov. Schwarzenegger signed SBX7_1, SBX7_2, SBX7_6, SBX7_7, and SBX7_8. *See generally* http://gov.ca.gov/bills/.

option. DFG initially intended to generate an amended EIR by July 2008, as ordered by the Alameda Superior Court in *Karuk Tribe of California v. California Department of Fish and Game* (*Karuk*).[3] Then, after determining that a SEIR would be necessary, DFG proposed a draft schedule to the court in which the SEIR would be certified in October 2009, which has already passed. DFG's current predictions are that the amended regulations will not be in effect until sometime in Spring 2011. Even if DFG meets this schedule, the moratorium will remain in effect for at least a year and a half; so that it is in effect no longer than necessary, DFG should carefully scope its SEIR.

B. Focusing the scope of the SEIR on suction dredging operations that are not already subject to environmental review is consistent with judicial and legislative intent and DFG's regulatory authority

We ask that DFG focus the scope of the SEIR on an analysis of suction dredging operations that are not already subject to environmental review under other state and federal laws. This approach is consistent with the intent and purposes of the moratorium legislation and the two related judicial decisions that preceded it in 2006, *Karuk Tribe of California v. California Department of Fish and Game* (*Karuk*), and 2009, *Hillman v. California Department of Fish and Game* (*Hillman*)[4], as well as DFG's regulatory authority.

The focus of the *Karuk* case was concern that individual gold miners receiving permits from DFG pursuant to Fish and Game Code Section 5653 were deleteriously affecting Coho salmon populations in the Klamath, Scott and Salmon Rivers.[5] When the issue returned to the court again in 2008 via the *Hillman* lawsuit, the focus again was on DFG's granting of permits to individuals under Section 5653. In *Hillman*, the court zeroed in on the fact that DFG's issuance of permits must be predicated on environmental review, as it is not a purely ministerial action, and it was the absence of environmental review that necessitated halting DFG's permit program.

In contrast, suction dredging operations that undergo environmental review would not trigger the insufficient-environmental-review problem that *Karuk* and *Hillman* sought to address. Therefore, these kinds of suction dredging operations should be outside the proper scope of DFG's SEIR.

Similarly, it is clear the moratorium legislation did not intend to force DFG to conduct a broader review than that contemplated by the court, since it specifically refers to the *Karuk* decision.[6] In addition, the legislative history repeatedly refers to the problem of "small-scale

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3 RG05 211597, Order and Consent Judgment issued December 20, 2006.

4 No. RG09-434444

5 *Id.* (finding that "new information which was not reasonably available to the Department at the time it completed the 1994 EIR that issuing suction dredge mining permits under the current regulations could result in environmental impacts different or more severe than the impacts evaluated in the 1994 EIR").

6 Fish & Game Code Section 5653.1(b)(1).

gold mining operations" and "recreational goldmining"[7], operations that traditionally fall through the regulatory cracks.

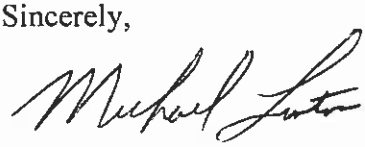
Further, DFG's suction dredge permitting authority is limited by Fish & Game Code Section 5653 *et seq* to "persons", not business entities.[8] The moratorium legislation did not expand this regulatory authority.[9] In fact, Section 5653.1 explicitly states that it "does not expand or provide new authority for the department[.] As such, it is clear the Legislature's intent was to focus DFG on suction dredging operations that are not otherwise regulated, leaving those already subject to environmental review outside the proper scope of the SEIR.

III. CONCLUSION

Beneficial and environmentally sound projects could be impeded by the broad moratorium that remains in place until DFG's SEIR and rulemaking are complete. To avoid this unintended consequence, DFG's SEIR should hone its SEIR analysis to capture only those suction dredging operations not subject to environmental review under other DFG programs or by other agencies.

Thank you for your attention to this matter. You may either contact Brian Anderson at 323-474-3205, or me at 323-474-3202, if you have any questions.

Sincerely,



Michael Linton
VP Properties and Land Development

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7 *See* Attachment A.

8 Fish & Game Code Section 5653.8.

9 Fish & Game Code Section 5653.1(c).

ATTACHMENT A

RELEVANT LEGISLATIVE HISTORY FOR SENATE BILL 670 (WIGGINS), CHAPTERED AT FISH & GAME CODE SECTION 5653.1

- **Key Message**: The Department of Fish and Game's ("DFG") new suction dredging regulations should target individual gold miners. Business entities whose dredging activities are regulated under other state and federal laws are outside the scope of DFG's regulatory authority and the intended scope of the environmental review to be conducted of DFG's suction dredging permitting program.

- **Legal and Legislative Support:**

I. <u>The Wiggins Bill is specifically concerned with gold mining</u>.

"This bill clarifies the process that DFG will follow to develop new regulations for the suction gold mining program." Senate Rules Committee, Bill Analysis.

"Suction dredging is used to remove sediment from channels boarded by levees, to maintain a river as navigable for larger vessels, and as part of a small-scale gold mining operation. It is the latter use of suction dredging that is the focus of this bill." Assembly Committee on Appropriations, Bill Analysis.

"Vacuum and suction gold dredging is a process by which power equipment is used to vacuum up sediment from the streambeds of rivers, creeks or other water bodies to search for gold. DFG issues permits for use of motorized vacuum or suction dredge equipment for recreational gold mining in California rivers and streams." Assembly Committee on Water, Parks & Wildlife, Bill Analysis.

II. <u>The Wiggins Bill is not concerned with suction dredging activities that are otherwise regulated</u>.

"Dredging permits issued by DFG state that the applicant will comply with all appropriate water quality regulations. However, the State Water Resources Control Board does not have a program to regulate suction dredging." Senate Rules Committee, Bill Analysis.

"The author notes the state's salmon fisheries are in crisis, with salmon fishing banned along the California coast for the second year in a row, affecting the livelihoods of thousands of commercial fishermen and others, while status quo has been allowed for recreational gold mining." Assembly Floor, Bill Analysis.

III. Existing Fish & Game Code provisions concerning suction dredging remain unchanged; they limit DFG's regulatory authority to the issuance of permits to persons and not large, commercial operations.

"The use of any vacuum or suction dredge equipment by any person in any river, stream, or lake of this state is prohibited, except as authorized under a permit issued to that person by the department[.]" Fish & Game Code Section 5653(a).

"For purposes of Sections 5653 and 5653.3, 'person' does not include a partnership, corporation, or other type of association." Fish & Game Code Section 5653.8.

IV. The Fish & Game Code provisions concerning suction dredge mining were enacted specifically to address the problem of individual gold miners.

See, e.g., "vacuum or suction devices ... to carry out gold dredging operations ...in rivers and streams." Bill Analysis of Senate Bill No. 1459 (Arnold), as amended in the Senate May 26, 1961.

"[I]ntent of this bill" is to regulate and control the use of "small portable dredging equipment used for gold recovery by skin divers in streams." Letter to Honorable Edmund G. Brown, Governor, from Senator Stanley Arnold (June 16, 1961).

The bill is "designed to control the activities of the 'weekend gold miners' who are using portable suction dredges . . . in the stream beds of northern and central part of the state." State of California Interdepartmental Communication to the Honorable Edmund G. Brown, Governor, from the Director, Department of Fish and Game, Subject: Senate Bill No. 1459 (June 28, 1961).

APPENDIX K: Private Citizen Comments (N - R)

From: Nick Oman <anick2@earthlink.net>
To: <dfgsuctiondredge@dfg.ca.gov>
Date: 11/23/2009 9:21 PM
Subject: suction dredging

About twenty years ago C.D.F.and G. did a little study on my mining claim. The river bed of my claim is like
>most river beds, boulder bound with hard pact gravels. With the input of the biologist I put the gravel in one pile, the cobbles in another
>pile. They asked me to use a spill-proof gas container and NOT to pan my mining concentrates back into the river. The next spring we went to the river and found the winter high water had made a loose gravel bar, perfect for fish spawn, the cobbles turned into perfect habitat
>for the little fish. The dredge hole turned into a deep cold water pool, 12 degrees colder than surface water. By not panning my mining
>concentrates back into the river I was able to remove over 12.5 oz of lead fish weights and old bullets plus a car battery. I have continued to dredge in a environmentally friendly way since,I feel that dredging could become an effective tool to help fish habitat, if done the correct way and it is just as healthy for the river as roto-tilling your garden.

From: pat keene <pat@keeneeng.com>
To: <mstopher@dfg.ca.gov>
Date: 12/3/2009 6:02 PM
Subject: FW: Pat
Attachments: dredge yardage Sheet1.pdf

Dear Mark Stopher,

I would first like to say that I appreciate your unbiased views and hope can work together with you and the department to get dredging open again.

As per our discussion at the Fresno scoping meeting about average yardages and capabilities of suction dredges. We have spent much time to give you realistic figures based on river conditions. These are good figures that we can all work with. I am sure if you check with any dredgers you will find that these formulas are true and correct. We made to different charts to represent both rocky type areas such as the Yuba River and large gravel bars as found on the Klammath River. Please feel free to ca me if you have any questions.

Sincerely,

Patrick Keene

Keene Engineering

Dredge Study

Typical California type conditions. Such as River Gravel on the Klamath River

All test are based on a 1 to 1 flow ratio. Hose length not to exceed 20 feet or less material will be moved.

Dredge Size hose Diameter	Engine horse power	Water flow GPM through the Suction hose	Total water discharge through Sluice	Average % of solids in slurry	Gallons of solids per minute	Cubic feet of solids per minute	Cubic feet of solids per hour	Cubic yard of solids per hour
2 inch	2.5 hp	40	80	1.5	0.6	0.08	4.93	0.18
2.5 inch	3.5 hp	50	100	1.5	0.75	0.10	6.17	0.23
3 inch	4 hp	100	200	1.5	1.5	0.21	12.33	0.46
4 inch	6 hp	150	300	1.5	2.25	0.31	18.50	0.69
5 inch	9 hp	300	600	1.5	4.5	0.62	36.99	1.37
6 inch	14 hp	350	700	1.5	5.25	0.72	43.16	1.60
8 inch	46 hp	750	1500	1.5	11.25	1.54	92.48	3.43
10 inch	95 hp	1600	3200	1.5	24	3.29	197.28	7.31

Typical California type conditions. Such as dredging on the North fork of Yuba River

All test are based on a 1 to 1 flow ratio. Hose length not to exceed 20 feet or less material will be moved.

Dredge Size hose Diameter	Engine horse power	Water flow GPM through the Suction hose	Total water discharge through Sluice	Average % of solids in slurry	Gallons of solids per minute	Cubic feet of solids per minute	Cubic feet of solids per hour	Cubic yard of solids per hour
2 inch	2.5 hp	40	80	1	0.4	0.05	3.29	0.12
2.5 inch	3.5 hp	50	100	1	0.5	0.07	4.11	0.15
3 inch	4 hp	100	200	1	1	0.14	8.22	0.30
4 inch	6 hp	150	300	1	1.5	0.21	12.33	0.46
5 inch	9 hp	300	600	1	3	0.41	24.66	0.91
6 inch	14 hp	350	700	1	3.5	0.48	28.77	1.07
8 inch	46 hp	750	1500	1	7.5	1.03	61.65	2.28
10 inch	95 hp	1600	3200	1	16	2.19	131.52	4.87

Nov. 13, 2009

California Department of Fish and Game
601 Locust Street
Redding, CA 96001
Attn: Mark Stopher

Re: Suction Dredge Permit Program

Dear Mr. Stopher,

We bought a gold claim a couple years ago in Plumas County on Spanish Creek. We were unable to come down last year because of the costs of gasoline.

On July 13, 2009 we sent a check for out of state dredge permit in the amount of $185.25. On July 21, 2009 you issued a Nonresident Suction Dredge Permit. When we received the permit we went out the first weekend in August and purchased a new 3" dredge costing around $3,000.00.

Our son lives in Placerville and called us after we purchased the dredge and said that he had heard something about the governor halting dredging in all of California. We went online and looked at the information and discovered that the governor the 1st of July issued a cease and desist the Fish & Game Dept. of issuing any dredge permits. Why is it that you still issued us a permit on July 21, 2009 and kept our money of $185.25.

We had taken a week vacation and had reservations in a RV campground in Quincy, CA for that week in September. We were not only out $185.25 but we would not have purchased a new dredge at that time if we had only known, but nothing was said when the 2009 California Nonresident Suction Dredge Permit was issued and sent to us. We went anyway and looked in Spanish Creek and tried to work on it in vain because we needed a dredge and also never saw any little fish in it.

The environmentalists are ruining our country. People are loosing their jobs and homes and our hungry because it seems to be that fish, birds, animals, etc. and more important than people. What is wrong with our country. We drove on Highway 5 in California and saw orchards and grape vines either dead or dying because of the lack of water. These owners worked hard all these years and spent lots of money building up these orchards and grapevines and must be sick seeing them dying. We were sick looking at them. People have lost their jobs. No wonder your state is in bad condition.

Our country is in a sad state of affairs. Instead of helping our people with jobs and food for our country, we let these orchards die. How is that right? We, the people need to stand up and fight for our rights. Let these people have their water to keep their orchards going so that they can feed the people of our land. We need to feed our people and quit depending on these other countries.

You should be reimbursing us our check for the out of state dredge as it was issued after the governor said not to. That was wrong.

The people in charge of our states and country need to start thinking about the people and what they are doing to them.

Sincerely,
Very unhappy in Washington,

Marsha Boyd

Paul & Marsha Boyd
121 Union Avenue SE
Renton, WA 98059

State of California—The Resources Agency
DEPARTMENT OF FISH AND GAME

2009 STANDARD SUCTION DREDGE PERMIT APPLICATION

TO OPERATE VACUUM OR SUCTION DREDGE

VALID JANUARY 1, 2009 THROUGH DECEMBER 31, 2009*

(If issued after January 1, valid on date issued.)

(*Subject to seasonal restrictions in Section 228.5, Title 14, of the California Code of Regulations)

FEES: **RESIDENT—$47.00** (No inspection required) **NONRESIDENT—$185.25** (No inspection required)
RESIDENT—$194.00 (Additional if inspection required) **NONRESIDENT—$222.00** (Additional if inspection required)

☐ **YES, I QUALIFY FOR AN ASSISTANT SUCTION DREDGE PERMIT (NO ADDITIONAL FEE)**

(Disabled applicants must apply and pay fees for resident or nonresident permit)

SEE INSTRUCTIONS ON REVERSE. TYPE OR PRINT CLEARLY.

FIRST NAME	MI	LAST NAME	DAY TELEPHONE (Voluntary)
Paul	E.	Boyd	(425) 444-9442

MAILING ADDRESS	DATE OF BIRTH
121 Union Ave. S.E.	02/07/1943

CITY	STATE	ZIP CODE	HEIGHT	WEIGHT
Renton	WA	98059	6'	260 lbs

DRIVER'S LICENSE OR DMV ID NUMBER/STATE	SEX	HAIR COLOR	EYE COLOR
	☒ MALE ☐ FEMALE	Gray	Blue

I HAVE RESIDED IN CALIFORNIA CONTINUOUSLY FOR THE LAST SIX MONTHS ☐ YES ☒ NO

("Resident" means any person who has resided continuously in the State of California for six months or more immediately prior to the date of his/her application for a license or permit, or any person on active military duty with the Armed Forces of the United States or auxiliary branch thereof, or any person enrolled in the Job Corps established pursuant to Section 2883 of Title 29 of the United State Code.) (Fish & G. Code, § 70.)

TYPE OF OPERATION *(Check one):* ☒ GOLD MINING ☐ SAND & GRAVEL ☐ OTHER *(Explain)*

SIZE OF AREA TO BE DREDGED *(Feet, yards, etc.)* 1/4 acre

TYPE OF EQUIPMENT

NAME AND MODEL NUMBER	NAME AND MODEL NUMBER	NAME AND MODEL NUMBER
hugget		
NOZZLE SIZE	NOZZLE SIZE	NOZZLE SIZE
3"		
HORSEPOWER	HORSEPOWER	HORSEPOWER
6.5		
POWER SOURCE	POWER SOURCE	POWER SOURCE
Gasoline Engine		

When a permit stamp has been affixed below, the applicant is authorized to operate a vacuum or suction dredge in accordance with Sections 228 and 228.5, Title 14, of the California Code of Regulations. Nothing in this permit shall authorize the permittee to trespass or use a dredge in waters passing over private lands without the permission of the landowner. The listing of waters open to dredging does not mean that such waters are open to the public. The permittee shall comply with all applicable federal, state, and local laws. Suction or vacuum dredges shall not be used where dredging is prohibited by such laws.

I hereby certify that I have read the provisions of California Fish and Game Code Section 5653 and Sections 228 and 228.5, Title 14, of the California Code of Regulations (see reverse side), and that I understand and agree to be bound by all the terms and restrictions set forth in this permit and in the above-named provisions. I hereby certify that all information contained on this application, and/or submitted to meet the requirements for issuance of this permit, is true and correct. I understand that in the event this information is found to be untrue or incorrect, the permit issued will be invalid and must be surrendered where purchased, and that I may be subject to criminal prosecution. I understand the Department of Fish and Game may suspend or revoke this permit pursuant to Section 228(c), Title 14, of the California Code of Regulations.

SIGNATURE	DATE
X Paul E Boyd	7-13-09

FOR DEPARTMENT OF FISH AND GAME USE ONLY

ISSUED BY	DFG OFFICE	CASH REGISTER TRANSACTION#	DATA ENTRY
WA	CRB	489679	7/21/09

2009 RESIDENT SUCTION DREDGE PERMIT	2009 CALIFORNIA NONRESIDENT SUCTION DREDGE PERMIT	ASSISTANT SUCTION DREDGE PERMIT	2009 INSPECTION	2009 DUPLICATE
No. 20	$185.25 400050-01		No.	No. 000
Date Issued	Invalid After December 31, 2009 Date Issued 7/21/09	Date Issued	Date Issued	Date Issued

NOV 17-09

Dear Mark Stopher,

We are in our 80's + are devistated about not being able to dredge.

We have had our claim in Downieville since 1992 and have a 4 inch + 8 inch dredge. My son does the dredging + my husband the winching.

We do not have Salmon on the North Yuba River so I do not know why we can no longer dredge.

We clean the river of mercury + the debri that careless people drop there.

The fish are spared (the trout) a slow death because we make deep holes for them to continue to live + in stirring up the water, we give the fish food that sat at the bottom of the river uneaten.

II

You should see how the fish wait to be fed these tidbits!
We pay taxes on this claim + paid good money to purchase this plot of land in 1992. What if people just walk away from there claims who then would pay the property taxes. It will be people like you + your neighbor, thats who.
We also pay to get our dredge permit, now whose going to pay this, no one thats who! We also pay at the Court House to show our assessment work + now no one gets that money. Then we pay the Dept of Forestry when we send in our assessment xeroxed paper. Now the Dept. of Forestry is out that money. The town of Downieville is small, they depend on the miners. The grocery store will suffer. The County will

III

suffer, the gas station will suffer & the restaurants will suffer.

I think this is a big mistake for everyone that owns a claim & I'm hoping things can get back to what it was in the past.

Sincerely
Mrs Paul Klemenok

Mr. & Mrs. Paul Klemenok, Jr.
2920A Eastman Ln.
Petaluma, CA 94952

From: "Phil DeRiemer" <phil@adventurekayaking.com>
To: <dfgsuctiondredge@dfg.ca.gov>
Date: 11/30/2009 6:43 PM
Subject: Suction dredging

Mark Stopher
California Department of Fish and Game
601 Locust Street
Redding, CA 96001

November 30th, 2009

Dear Mr. Stopher,

I am writing to add my voice to the number of people that are opposed to suction mining. I am not a biologist, nor a hydrologist so I have no hard facts to fall back on other than personal experience. I have been a river runner for close to thirty years. My local river, the South Fork of the American allowed suction dredging up until the recent ban. I have paddled extensively on the California Salmon, Klamath and Trinity rivers where suction dredging has been highly evident in the past. The materials displacement, sediment plumes, overall effect of water quality and noise are obvious to anyone observing suction dredging. Today's mining laws are long overdue for an overhaul and suction dredging is a worthy place to start.

Sincerely,

Phil DeRiemer
P.O. Box 559
Lotus, CA. 95651

From: "PROSPECTORS DEPOT" <pbdesert@prospectorsdepot.com>
To: <dfgsuctiondredge@dfg.ca.gov>
Date: 11/5/2009 6:47 AM
Subject: SUCTION DREDGE ISSUE

Dear Mr. Stopher:

I have owned and operated a small mining supply company in a remote location of the lower Mojave Desert for now 5 years. I sell metal detectors, dry washers, dredges and the accessories which accompany this equipment. Annually I sell approximately $60,000.00 worth of Keene Engineering dredges & equipment to the California public. This income provides a necessary stimulation to the local economy and helps employ people who were previously out of work. This moratorium is hurting my business and many others by dragging into the fall months. Many of my customers were making a living in this rough economy by harvesting small amounts of gold with the use of the Keene Dredges. At a time in California's history when the issue is income for the state it seems like rotten timing to simply smother a thriving industry with such a devastating blow! It is greatly diminishing the tax revenue from these sales! California is trying to put good companies and people out of business with no credible environmental proof before hand. Logic would clearly state that an investigation into the environmental issues should have taken place long before the moratorium was ever initiated Would you not agree?

Let's pull the plug on these petty politics and put California's Mining Industry back to work before good businesses close their doors under the guise of unsubstantiated speculation.

Regards,

Philip Bonafede, CEO
North & South American Minelab Sales
Prospectors Depot International Mining, Inc.
Keene Engineering Authorized Dealer
63125 Red Horse Run
Joshua Tree CA 92252
760.366.3333
866.366.8511
info@prospectorsdepot.com
www.prospectorsdepot.com
http://stores.shop.ebay.com/prospectors-depot__W0QQ_armrsZ1
www.minelab.com

ATT: MARK STOPHER

R. FLAIM

(1)

WRITTEN RESPONSE

I FIND THE PROJECT DISCRIPTIONS TO BE ADEQUATE AND INFORMATIVE, ESPECIALLY THE DEFFINATIONS OF FISH AND SUCTION DREDGE (MOTORIZED) ARE UNDERSTOOD AND SUFFICIENTLY DEPICTED. THE USE OF "DELETERIOUS TO FISH" STANDS AS PRESENT AND/OR LONG TERM PHYSICAL HARM TO FISH RESULTING IN TERMINATION.

I ATTENDED THE SCOPING MEETING AND FOUND IT TO BE VERY USEFUL. I HAVE BEEN A MINER IN CALIFORNIA SINCE 1976. I CURRENTLY OWN PLACER CLAIMS IN THE REDDING AREA. SUCTION DREDGING HAS BEEN PREDOMINATELY MY TYPE OF PLACER GOLD RECOVERY.

I ENJOY DISCOVERING GOLD IN CLEAR CR. MY GRANDCHILDREN HELP US DREDGE. MY WIFE HAS A DISABILITY AND ENJOYS THE GRANDCHILDREN AS HER FAVORITE ASSISTANTS. THE CURRENT REGULATIONS FOR SUCTION DREDGE MINING ARE UNDERSTOOD BY ALL OF MY FAMILY MEMBERS. WE ENJOY OPENING WEEKEND TOGETHER, AS DREDGING CREATES A SWIMMING HOLE BY CAMP TO ENJOY ALL SEASON. THE BOYS OFTEN ENJOY FISHING THE CREEK.

THE FISH WE SEE INCLUDE; BROOK TROUT (RAINBOW-GERMAN SPOTTED); A WHITE FISH (W/SMALL MOUTH VARIOUS FROGS; A SMALL RECLUSIVE SUCKER FISH THAT PAUSES AND BLENDS IN TO THE BOTTOM; SEMI-AQUATIC SALAMANDERS (WATER DOGS/NEWTS); AQUATIC SALAMANDERS (MUD PUPPY-BIGGER REDISH BROWN/GREY UP TO 12" INCHES) THAT SEEM TO VANISH OR HIDE; A LITTLE WORM/BUG

ATT: MARK STOPHER

R. FLAIM

(1)

WRITTEN RESPONSE

I FIND THE PROJECT DISCRIPTIONS TO BE ADEQUATE AND INFORMATIVE, ESPECIALLY THE DEFFINATION, OF FISH AND SUCTION DREDGE (MODIFIED) ARE UNDERSTOOD AND SUFFICIENTLY DEPICTED. THE USE OF "DELETERIOUS TO FISH" STANDS AS PRESENT AND/OR LONG TERM PHYSICAL HARM TO FISH RESULTING IN TERMINATION.

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R. FLAIM

(2)

WRITTEN RESPONSE

THAT MAKES A CACOON OUT OF SAND PEBBLES (APROX. 1" LONG) THAT I BELIEVE BECOMES A FLY; SNAILS; SLUGS BOTH IN & OUT OF THE CREEK; TINY WATER SNAILS WITH A SPIRAL SHELL (APROX. 1 CM). THERE IS AN ABSENCE OF FRESH WATER CLAMS CRAYFISH & WATERSNAKES. (PLEASE EXUSE THE CRUDE DESCRIPTIONS AS I DONT KNOW THE NAMES OF THESE FISH.) THERE ARE COUNLES OTHER ANIMALS, REPTILES & BIRDS FROM LIZARDS TO BEARS THAT WE HAVE SEEN TO

WHILE UNDER WATER OPERATING MY DREDGE I HAVE OBSERVED AQUATIC LIFE. I HAVE WATCHED THE SMALL TROUT STAY IN THE CURRENT UNDER THE SUCTION DREDGE. AS THE WATER EXITS THE SLUICE BOX I WATCH THE TROUT JET SIDE TO SIDE FEEDING ON THE OVERBURDEN I AM MOVING. THE FIRST TIME I SUCKED UP A SMALL (3" INCH) BOTTOM SUCKER FISH I PANICKED, SHUT OFF THE DREDGE, AND FOUND IT HAPPILY HIDING WITH THE GRAVEL IN MY SLUICE BOX RELIEVED, I RESTARTED THE WATER FLOW AND WITH A NUDGE THE FISH SWAM BACK DOWN INTO THE CREEK. I SEE THIS TYPE OF FISH IN EVERY DREDGED HOLE I CREATE ON CLEAR CREEK. IT IS GAME-LIKE FOR THE FISH ALWAYS TRYES TO REMAIN MOTION LESS UNTIL THE LAST POSSIBLE INSTANT AS I APROACH. IT HAS DEFINATELY MASTERED BLENDING IN. IT IS MY UNDER WATER OBSERVANCE THAT THESE TYPES OF FISH BENIFIT BY FEEDING IN THE SEDIMENT THAT IS MOVED.

R. FLAIM

(3)

WRITTEN RESPONSE

I HAVE RECOVERED SMALL AMOUNTS OF QUICKSILVER WHILE DREDGING. MY ESTIMATE IS APROXIMATELY 2 GRAINS PER yd. OF GRAVEL. HOWEVER, I HAVE MINED 30' Lin ft. OF CREEK WITHOUT RECOVERING ANY, WHILE MOVING APROXIMATELY 4 YDS OF OVER BURDEN. IT IS BY FAR JUST A SPECK COMPAIRED TO THE GOLD RECOVERE WITH IT.

IT SHOULD BE NOTED THAT WHILE THE MANUFACTURES SPECIFICATIONS REGARDING VOLUME OF YARDS OF GRAVEL PER HOUR OF OPERATION IS A BASELINE FOR THE PROJECT, I OFTEN SLOW THE INTAKE OF GRAVEL AT THE NOZEL OF MY SUCTION DREDGE TO WATCH FOR A FLASH OF "COLOR" (GOLD). THIS DISCOVERY MOMENT DURING RECOVERY IS MISSED WHEN OPERATING AT MAXIMUM CAPACITY. I ENJOY MOVING A LITTLE GRAVEL THEN PICKING UP/OUT THE GOLD I SEE.

THERE SHOULD ALSO BE CONSIDERATION TO THE AMOUNT OF ROCK THAT IS HAND MOVED. IT TAKES CONSIDEABLE TIME TO MOVE ALL MATERIAL TO LARGE FOR THE INTAKE NOZEL. GENERALLY THE MINING HOLES I HAVE CREATED ARE REFILLED WITH SEASONAL HIGH-WATER FLOWS. I MOVE TWO TO FIVE YARDS OF MATERIAL PER 3 DAY MINING TRIP. I AVERAGE FOUR TRIPS PER SUCTION DREDGE SEASON.

R. FLAIM

(4)

WRITTEN RESPONSE

I HAVE ALWAYS FOUND AQUATIC LIFE TO BE PRESENT WHEN I MINE. SINCE 1977 I HAVE MINED IN THE UPPER SACRAMENTO; ALLEGHENY CR.; TRINITY RIVER; CLEAR CR.; JERUSALEM CREEK; YUBA RIVER; AND VARIOUS SMALL TRIBUTARIES. I HAVE ALWAYS CAMPED OUT, DEVELOPING CAMPSITES ON FEDERAL LANDS TO ENJOY. I DO MY BEST TO LEAVE THE AREA AS I FOUND IT FOR OTHERS TO ENJOY.

Thanks

R. Flaim

Rebecca S. Moore
P O Box 484
Cloverdale CA 95425

Nov. 13, 2009

Mark Stopher
CA Dept of Fish & Game
601 Locust St
Redding CA 96001

Re: Suction dredging

Dear Mr. Stopher:

Our family has been involved in suction dredging on the Trinity River for the past 1-1/2 years for a total of approximately 30 hours of actual dredge time. It is done for recreational purposes a few weekends each year, and provides quality outdoor, enjoyable, activity for our families.

My husband is an avid fisherman and has been all his life. We are very cognizant of complying with all of the rules and regulations, pay close attention to the results of our activities and have never noticed anything detrimental to the river as a result of our dredging operation.

One of the reasons cited in opposition of dredging was the destruction of eels in the system. We have seen several small eels as well as a variety of bugs go through the dredge without harm and all are placed back into the water. It must be remembered that these creatures are subjected only to fast moving water.

The moratorium does have a detrimental affect on our State. Whether dredging is done as a way of living or for recreational purposes, we, the people involved in dredging, may no longer travel, purchase fuel for our vehicles and dredges, stay in motels, eat meals out, purchase supplies, maintain and repair equipment, spend money on related recreation such as fishing, hiking, biking etc. The money taken out of circulation affects hundreds of small California businesses and, in turn, this affects the State of California through fewer tax dollars.

None of want to be detrimental to our rivers and streams and we want to continue to enjoy and use them. It seems that the most balanced solution would be to remove the moratorium, since the restrictions prior to the moratorium were sufficient, and do a study with the dredges in operation. California can get permit fees and tax dollars, businesses can survive, people can enjoy the outdoor recreation, and the study can continue. ***Everyone wins***.

Yours very truly

Rebecca S. Moore

Rebecca S. Moore

From: Reeve Kahabka <az19lund@yahoo.com>
To: <dfgsuctiondredge@dfg.ca.gov>
Date: 11/6/2009 5:59 AM
Subject: Suction dredging inCalifornia

Dear sirs:

I started dredging 4 years ago in northern California and in that time I have seen a large increase in the number of fish that come around the nozzle to grab the nutrients that float up. I dredge in the same area so I believe it is a true comparison to what was there before I started dredging, as there is clean sand for the fish to lay their eggs. I spend about $2300
for the ten days that I'm there. It is truly a trip my wife and I look forward to each year not only for the dredging but the area is beautiful and the people are great. Please don't take this away permanently.
Sincerely

Reeve Kahabka

From: Reggie Gould <gould@gouldeng.com>
To: <dfgsuctiondredge@dfg.ca.gov>
Date: 11/17/2009 12:26 PM
Subject: reggie Gould

> Mark Stopher
> California Dept. of Fish & Game
>
> Reggie Gould
> PO Box 406
> Garden Valley, CA 95633
>
> Mark,
> I have read the report produced by Joseph C. Greene “Suction Dredge
> Mining”. It was sent to the State Water Resources Control board
> Division of Water quality June 6, 2007 but I guess our civic leaders
> that are supposed to represent us forgot to read.
> The report is about as comprehensive as it could be addressing the
> Dredging issue.
> The two opening statements under the heading “Geographical Scale of
> Small Suction Dredging” sum's up the whole report.
> All through the report various studies by the Dept. of fish & Game are
> quoted of the very small impact as low as 0.1% of dredging on the
> impact on the quality of water, turbidity.
> The environmentalists opposing dredging are doing so without any sort
> of facts to back up their claims.
> The studies have been done all they have to do is read them.
> Most of them are confusing huge hydraulic mining in the past with
> small scale suction dredging that has less then 0.1% impact on the fish.
> It is unfortunate that a handful of liberal legislators could impose
> their liberal viewpoints on a recreational hobby and shut it down.
> In a democracy the will of the people is supposed to prevail but in
> this case a few have enacted a law supported by a handful of liberal
> self-serving environmentalists.
> It is my hope that this grave injustice will be overturned.
>
> Thank You,
> R. J. Gould

From: "Ric Costales" <rcostales@co.siskiyou.ca.us>
To: <dfgsuctiondredge@dfg.ca.gov>
Date: 12/3/2009 3:04 PM
Subject: Suction Dredge Scoping Comments
Attachments: Suction Dredging Scoping Comment Pkg.pdf

Mark:

Attached please find pdf version of my comments on the suction dredging SEIR. Hard copy in the mail. Thanks!

Ric Costales

Natural Resource Policy Specialist

County of Siskiyou

PO Box 750

201 4th St.

Yreka, CA 96097-0750

Phone: (530) 842-8012

FAX: (530) 842-8013

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COUNTY OF SISKIYOU

COUNTY ADMINISTRATIVE OFFICE

Ric Costales, Natural Resource Policy Specialist
P.O. Box 750 • 201 Fourth Street, Yreka, CA 96097
Phone: (530) 842-8012, Fax Number: (530) 842-8013
Email: rcostales@co.siskiyou.ca.us

Mark Stopher
Environmental Program Manager
California Department of Fish and Game
601 Locust Street
Redding, CA 96001

RE: Suction Dredging Scoping related to SB 670

December 3, 2009

Dear Mark:

As we have discussed on two occasions, I am very concerned about the baseline that is being used to assess significance of impact of suction dredging in the DFG's proposed Subsequent Environmental Impact Report (SEIR). As we have both agreed, different outcomes for potentially required mitigation can definitely hinge upon whether an impact is measured against previously permitted suction dredging or against the background of no dredging which the Department has adopted as the baseline.

We have also both agreed that it is critical to get people back to work as soon as possible. Litigation certainly has the potential to prolong the cessation of suction dredging beyond all reason. I sympathize with the Department's feeling that the best way to avoid potential litigation is to follow the most conservative course, as well as the course mandated by CEQA, and use the conditions that were in existence at the time the Notice of Preparation was filed (i.e. "no dredging").

However, the lawsuit currently on file by the mining interests has a very reasonable likelihood of resulting in a decision that mining was unlawfully halted. If this turns out to be the case, I would think this would set the SEIR process back to square one, thus defeating the Department's goal of getting allowable suction dredging operations back to work as soon as possible. It seems a prudent course to avoid having to start the process over would be to simultaneously assess suction dredging against both possible baselines. It doesn't seem that this is an excessively expensive "hedge" against the costly risk of having to start over.

As you are well aware, the coordination between federal and state agencies and Siskiyou County has long been a sore point with the Board of Supervisors. Siskiyou County has formally requested the DFG to coordinate whenever it engages in activities that may affect the County (see attached Resolution 08-153 and mailing list) thus asserting its right under numerous state statutes cited within the Resolution. While there is certainly much confusion about what constitutes coordination, a lawsuit filed and won by California Attorney General Brown (California Resources Agency vs USDA, Case3:08-cv-03884-MHP), albeit dealing with federal statutes, sheds light on this relationship. "Coordination" is distinct from the labor- and technically-intensive "cooperating agency" status with which it is commonly confused. Rather, the burden is on the agency to generally strive to achieve the greatest possible level of consistency with local laws and policy with regard to whatever action or "project" it is contemplating. It is hoped that in the process of developing the SEIR, the Department will fulfill the intentions of the coordination mandate. I would be happy to provide you with any ordinances, policies, general plan elements, letters, etc., that would be of assistance to you in coordinating with local government.

As part of the policies of Siskiyou County, we have adopted the Siskiyou County Comprehensive Land and Resource Management Plan (SCCLRMP) which is designed to assist both federal (NEPA) and state (CEQA) processes in coordinating with the County. A somewhat readable OCR version is available at

http://library.ceres.ca.gov/docs/data/1600/1646/HYPEROCR/hyperocr.html

While I realize the CEQA process does not mandate a socio-economic assessment, but rather that it is included as part of the rule-making process, the SCCLRMP mandates that a socio-economic analysis be conducted as part of the environmental review. The rationale is that such socio-economic affects as may be visited upon the human environment by a project may have the potential to affect the natural environment. Again, it is hoped that DFG coordination with the County will render the SEIR consistent with this critical County policy.

Finally, since the topic of socio-economics is a good segue and particularly since the same SEIR contractor is doing the socio-economic work, at the scoping meeting the other night in Redding, the contractor offered a draft of the socio-economic survey for miners. They are not the only ones suffering the brunt of the infringement on miners' rights. Businesses in river communities are also being affected substantially and they likewise need to be surveyed.

Thank you for your consideration.

Sincerely,

Ric Costales, Natural Resource Policy Specialist
County of Siskiyou

RESOLUTION OF THE BOARD OF SUPERVISORS
OF THE COUNTY OF SISKIYOU ASSERTING LEGAL
STANDING AND FORMALLY REQUESTING
COORDINATION WITH ALL FEDERAL AND STATE AGENCIES
MAINTAINING JURISDICTION OVER LANDS AND/OR
RESOURCES LOCATED IN SISKIYOU COUNTY

WHEREAS, Siskiyou County is a public unit of local government and a five member elected Board of Supervisors serves as its chief governing authority; and,

WHEREAS, the Siskiyou County Board of Supervisors is charged with supervising and protecting the tax base of the County and establishing comprehensive land use plans (including, but not limited to, the General Plan) outlining present and future authorized uses for all lands and resources situated within the County; and,

WHEREAS, Siskiyou County is engaged in the land use planning process for future land uses to serve the welfare of all the citizens of Siskiyou County; and,

WHEREAS, approximately sixty-eight percent (68%) of lands in Siskiyou County are publicly owned, managed, and/or regulated by various federal and state agencies; and,

WHEREAS, the citizens of Siskiyou County historically earn their livelihood from activities reliant upon natural resources and land which produces natural resources is critical to the economy of Siskiyou County; and,

WHEREAS, the economic base and stability of Siskiyou County is largely dependent upon commercial and business activities operated on federally and state owned, managed, and/or regulated lands that include, but are not limited to, recreation, tourism, timber harvesting, mining, livestock grazing, and other commercial pursuits; and,

WHEREAS, Siskiyou County desires to assure that federal and state agencies shall inform the Board of Supervisors of all ending or proposed actions affecting local communities and citizens within Siskiyou County and coordinate with the Board of Supervisors in the planning and implementation of those actions; and,

WHEREAS, coordination of planning and management actions is mandated by federal laws governing land management, including the Federal Land Policy and Management Act, 43 USC § 1701, and 43 USC § 1712, regarding the coordinate status of a county engaging in the land use planning process, and requires that the "Secretary of

SISKIYOU COUNTY
RESOLUTION
No. 08-153

the Interior [Secretary] shall . . . coordinate the land use inventory, planning and management activities . . . with the land use planning and management programs of other federal departments and agencies and of the state and local governments within which the lands are located"; and,

WHEREAS, the coordination requirements of Section 1712 provide for special involvement by government officials who are engaged in the land use planning process; and,

WHEREAS, Section 1712 sets forth the nature of the coordination required with planning efforts by government officials and subsection (f) of Section 1712 sets forth an additional requirement that the Secretary "shall allow an opportunity for public involvement" (including local government without limiting the coordination requirement of Section 1712 allowing land or resource management or regulatory agencies to simply lump local government in with special interest groups of citizens or members of the public in general); and,

WHEREAS, Section 1712 also provides that the "Secretary shall . . . assist in resolving, to the extent practical, inconsistencies between federal and non-federal government plans" and gives preference to those counties which are engaging in the planning process over the general public, special interest groups of citizens, and even counties not engaging in a land use planning program; and,

WHEREAS, the requirement that the Secretary "coordinate" land use inventory, planning, and management activities with local governments, requires the assisting in resolving inconsistencies to mean that the resolution process takes place during the planning cycle instead of at the end of the planning cycle when the draft federal plan or proposed action is released for public review; and,

WHEREAS, Section 1712 further requires that the "Secretary shall . . . provide for meaningful public involvement of state and local government officials . . . in the development of land use programs, land use regulations, and land use decisions for public lands"; and, when read in light of the "coordinate" requirement of Section 1712, reasonably contemplates "meaningful involvement" as referring to ongoing consultations and involvement throughout the planning cycle, not merely at the end of the planning cycle; and,

WHEREAS, Section 1712 further provides that the Secretary must assure that the federal agency's land use plan be "consistent with state and local plans" to the maximum extent possible under federal law and the purposes of the Federal Land Policy and Management Act and distinguishes local government officials from members of the general

public or special interest groups of citizens; and,

WHEREAS, the Environmental Protection Agency, charged with administration and implementation of the National Environmental Policy Act (NEPA), has issued regulations which require that federal agencies consider the economic impact of their actions and plans on local government such as Siskiyou County; and,

WHEREAS, NEPA requires federal agencies to consider the impact of their actions on the customs of the people as shown by their beliefs, social forms, and "material traits," it reasonably follows that NEPA requires federal agencies to consider the impact of their actions on the rural, land and resource-oriented citizens of Siskiyou County who depend on the "material traits" including recreation, tourism, timber harvesting, mining, livestock grazing, and other commercial pursuits for their economic livelihoods; and,

WHEREAS, NEPA requires federal agencies to consider the impact of their actions on the customs, beliefs, and social forms, as well as the "material traits" of the people; and,

WHEREAS, it is reasonable to interpret NEPA as requiring federal agencies to consider the impacts of their actions on those traditional and historical and economic practices, including commercial and business activities, which are performed or operated on federally and state managed lands (including, but not limited to, recreation, tourism, timber harvesting, mining, livestock grazing, and other commercial pursuits); and,

WHEREAS, 42 USC § 4331 places upon federal agencies the "continuing responsibility . . . to use all practical means, consistent with other considerations of national policy to . . . preserve important historic, culture, and natural aspects of our national heritage"; and,

WHEREAS, Webster's New Collegiate Dictionary (at 227, 1975) defines "culture" as "customary beliefs, social forms, and material traits of a group; the integrated pattern of human behavior passed to succeeding generations"; and,

WHEREAS, In 16 USC § 1604, the National Forest Management Act, requires the Forest Service to coordinate its planning processes with local government units such as Siskiyou County; and,

WHEREAS, federal agencies implementing the Endangered Species Act, the Clean Water Act, the Clean Air Act, and the Outdoor Recreation Coordination Act (16 USC § 4601-1(c) and (d)) are required by Congress to consider local plans and to coordinate and cooperate directly with plans of local government such as Siskiyou County; and,

WHEREAS, the coordinating provisions referred to in the resolution require the Secretary of the Interior to work directly with local government to resolve water resource issues and with regard to recreation uses of the federal lands, and,

WHEREAS, the regulations issued by the federal agencies in this resolution are consistent with statutory requirements of coordination and direct cooperation and provide implementation processes for such coordination and direction consideration and communication; and,

WHEREAS, the California Constitution has recognized Siskiyou County's authority to exercise its local, police and sanitary powers, and the California Legislature has recognized and mandated exercise of certain of those powers in specific statutes; and,

WHEREAS, the California Legislature has mandated in Government Code Section 65300 that each county shall prepare a comprehensive plan, and stated legislative intent in Section 65300.9 that the county planning shall be coordinated with federal and state program activities, and has mandated in Section 65103 that county local plans and programs must be coordinated with plans and programs of other agencies; and,

WHEREAS, the California Legislature has stated its intent in Section 65070 that preparation of state and regional transportation plans be performed in a cooperative process involving local government; and,

WHEREAS, the California Legislature has mandated in Section 65040 that the State Office of Planning and Research shall "coordinate, in conjunction with . . . local agencies with regard to matters relating to the environmental quality of the state"; and,

WHEREAS, in Water Code §§ 8125-8129, the California Legislature has placed planning for non-navigable streams within the authority of county supervisors, and since such planning activities must be coordinated with natural resource planning processes of federal and state agencies; and,

WHEREAS, in Streets and Highways Code §§ 940-941.2, the California Legislature has placed the general supervision, management, and control of county roads and highways - including closing such roads (Section 901) and removing and preventing encroachment of such roads and highways, and since planning and actions with regard to such roads by any federal or state agency must be coordinated with the county; and,

WHEREAS, in Public Resources Code § 5099.3, the California Legislature has mandated coordination by the state with Siskiyou County since it is a county "having interest in the planning, development, and maintenance of outdoor recreation resources

and facilities,"

NOW, THEREFORE, BE IT RESOLVED that the Siskiyou County Board of Supervisors does hereby assert legal standing and formally requests coordination status with all federal and state agencies maintaining jurisdiction over lands and/or resources located within Siskiyou County.

BE IT FURTHER RESOLVED that the Clerk of the Board shall cause a copy of this Resolution to be transmitted annually to local, regional, state, and/or national offices of all federal and state agencies maintaining jurisdiction of lands and/or resources located within Siskiyou County and to all federal and state elected representatives serving Siskiyou County.

BE IT FURTHER RESOLVED that the Clerk of the Board of Supervisors is authorized and hereby directed to publish a copy of this Resolution in the Siskiyou Daily News, a newspaper of general circulation printed and published in Siskiyou County, California.

PASSED AND ADOPTED this 12th day of August, 2008, by the following vote:

AYES: Supervisors Overman, Erickson, Armstrong, Kobseff and Cook
NOES: NONE
ABSENT: NONE
ABSTAIN: NONE

Chair, Board of Supervisors
W.R. Overman

ATTEST:
COLLEEN SETZER, CLERK
Board of Supervisors
By
Deputy

G:\Share\RESOLUTN\Coordination with State and Federal Agencies 2008 RES.wpd

Agencies federal:

Bureau of Reclamation - Klamath Falls
Christine Karas, Acting Area Manager
6600 Washburn Way,
Klamath Falls, Oregon 97603

Klamath National Forest
Patricia A. Grantham, Forest Supervisor
1312 Fairlane Road
Yreka, CA 96097-9549

Six Rivers National Forest
Tyrone Kelley, Forest Supervisor
1330 Bayshore Way
Eureka, CA 95501

Modoc National Forest
Stanley G. Sylva, Forest Supervisor
800 West 12th Street
Alturas, California 96101

USDA Service Center
Shasta-Trinity National Forest
3644 Avtech Parkway
Redding, CA 96002

Rogue River-Siskiyou National Forest
Scott Conroy, Forest Supervisor
3040 Biddle Road
Medford, OR 97504

Bureau of Land Management – Redding
355 Hemsted Drive
Redding, CA 96002

Bureau of Land Management
Medford Office
3040 Biddle Road
Medford, OR 97504

Bureau of Land Management Ashland ****

Bureau of Land Management
2950 Riverside Drive
Susanville, CA 96130

US Fish and Wildlife Yreka
1829 S Oregon St
Yreka, CA 96097

US Fish and Wildlife
Klamath Basin National Wildlife Refuges
4009 Hill Road
Tulelake, CA 96134

NOA Fisheries – ***
NOAA Office of Program Planning and Integration
1315 East West Highway
Silver Spring, MD 20910

US Army Corps of Engineers, Sacramento District
Colonel Thomas C. Chapman, District Engineer
1325 J Street
Sacramento, CA 95814

National Park Service - Pacific West Region
Regional Director, Jon Jarvis
One Jackson Center
1111 Jackson Street, Suite 700
Oakland, CA 94607

National Grasslands in Butte Valley –
US Forest Service, RGE
1400 Independence Ave., SW, Mailstop Code: 1103
Washington DC 20250-1103

US EPA Region 9
75 Hawthorne Street
San Francisco, CA, 94105

Bureau of Indian Affairs Redding
US Indian Affairs Bureau
1900 Churn Creek Rd
Redding, CA 96002

Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

USGS Fort Collins,CO
Central Region US Geological Survey
Box 25046 Denver Federal Center
Denver, CO 80225

Western Region US Geological Survey
345 Middlefield Road
Menlo Park, CA 94025

USDA NRCS, Yreka
USDA, NRCS, Deputy Chief for Programs
14th and Independence Ave., SW., Room 5109-S
Washington, DC 20250

Pacific Fishery Management Council
7700 NE Ambassador Place, Suite 101
Portland, OR 97220-1384

NMFS Southwest Region
501 West Ocean Blvd.
Long Beach CA 90802-4213

STATE Agencies

California Board of Forestry
State Board of Forestry and Fire Protection
P.O. BOX 944246
Sacramento, CA 94244-2460

CalFire
Cal Fire State Headquarters
PO Box 944246
Sacramento, CA 94244-2460

CA Dept. of Fish and Game Sacramento, Redding, Yreka, Butte Valley Wildlife, Shasta Valley Wildlife

DFG Headquarters
1416 9th Street
Sacramento, CA 95814

Main Office
601 Locust Street
Redding, CA 96001

State Resources Agency Resources Agency
1416 Ninth Street, Suite 1311
Sacramento, CA 95814

California State Lands Commission
Sacramento Office
1001 Howe Ave, Ste. 100, South
Sacramento, CA 95825-8202

Cal EPA
1001 ‘I’ Street
P.O. Box 2815
Sacramento, CA
95812-2815

CARB California Air Resources Board
1001 "I" Street
P.O. Box 2815
Sacramento, CA 95812

Dept. of Water Resources Sacto.,
Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

Redding (no listing in Redding)

State Water Resources Control Board, Sacto.
1001 ‘I’ Street
P.O. Box 100
Sacramento, CA 95812-0100

North Coast Regional Water Quality Control Board
5550 Skylane Boulevard, Suite A
Santa Rosa, CA 95403

State Mining and Geology Board
Office of Mine Reclamation
801 K Street, MS 09-06
Sacramento, CA 95814

California Biodiversity Council
c/o CAL FIRE FRAP
PO Box 944246
Sacramento, CA 94244

California Coastal Commission
Headquarters Office
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219

North Coast District Office
Bob Merrill, District Manager
710 E Street, Suite 200
Eureka, CA 95501

Caltrans
P.O. Box 942873
Sacramento, CA 94273-0001
District 2
P.O. Box 496073
Redding, CA 96049-6073

Dept. of Conservation
DOC Headquarters
801 ‘K’ Street, MS 24-01
Sacramento, CA 95814

California Fish and Game Commission
1416 Ninth Street
P.O. Box 944209
Sacramento, CA 94244-2090

California Department of Parks and Recreation
Office of Historic Preservation
P.O. Box 942896
Sacramento, CA 94296-0001

Dept. of Pesticide Regulation
1001 I Street
P.O. Box 4015
Sacramento, CA 95812-4015

California Energy Commission
Media and Public Communications Office
1516 Ninth Street, MS-29
Sacramento, CA 95814-5512

Central Valley Regional Water Quality Control Board
Sacramento Main Office
11020 Sun Center Drive #200
Rancho Cordova, CA 95670-6114

Redding Branch Office
415 Knollcrest Drive, Suite 100
Redding, CA 96002

US Attorney McGregor Scott
United States Attorney's Office
501 ‘I’ Street, Suite 10-100
Sacramento, CA 95814

CA Governor Arnold Schwarzenegger
State Capitol Building
Sacramento, CA 95814

OR Governor Ted Kulongoski
160 State Capitol
900 Court Street
Salem, Oregon 97301-4047

US Department of Interior
1849 C Street, NW
Washington DC 20240

US Department of Agriculture
1400 Independence Ave., SW
Washington, DC 20250

Oregon Water Resources Department
725 Summer Street NE, Suite A
Salem, OR 97301

Senator Dianne Feinstein
United States Senate
331 Hart Senate Office Building
Washington, D.C. 20510

One Post Street, Suite 2450
San Francisco, CA 94104

US Senator Barbara Boxer
1700 Montgomery Street, Ste. 240
San Francisco, CA 94111

501 ‘I’ Street
Sacramento, CA 95814

Congressman Wally Herger
2268 Rayburn House Office Building
Washington, DC 20515

410 Hemsted Drive, Suite 115
Redding, CA 96002

Congressman Mike Thompson
WASHINGTON, DC OFFICE
231 Cannon Office Building
Washington, DC 20515

HUMBOLDT DISTRICT OFFICE
317 3rd Street, Suite 1
Eureka, CA 95501

State Senator Sam Aanestad
State Capitol, Room 2054
Sacramento, CA 95814

2400 Washington Ave # 301B
Redding, CA 96001

Assemblyman Doug LaMalfa
State Capitol, Room 4164
P.O. Box 942849
Sacramento, CA 94249-0002

Redding District Office
2865 Churn Creek Rd, Suite B
Redding, CA 96002

Klamath County Oregon
Klamath County Board of Commissioners
305 Main Street
Klamath Falls, OR 97601

Trinity County CA
Trinity County Board of Supervisors
PO Box 1613
Weaverville, CA 96093

Humboldt County CA
Humboldt County Board of Supervisors
825 Fifth Street, Room 111
Eureka, CA 95501

Del Norte County CA
Administration
981 H Street, Suite 210
Crescent City, CA 95531

Del Norte County Board of Supervisors
981 H Street, Suite 200
Crescent City, CA 95531

Herald & News
P.O. Box 788
Klamath Falls, Ore. 97601

Siskiyou Daily News
PO Box 129
Yreka CA 96097

Pioneer Press
PO Box 400
Fort Jones, CA 96032

Southern Siskiyou News
PO Box 127
Mt. Shasta CA 96067

From: wendy drake <wendysventures@yahoo.com>
To: <dfgsuctiondredge@dfg.ca.gov>
Date: 11/9/2009 9:25 AM

It is absolutely ridicules to say that suction dredging is harmfull to the fish. There have been many studies showing that it cleans gravels to improve fish habitat. The studies go on and on. As usuual there are always a few who abuse the system. There are enough laws already on the books to deal with abuse. That goes for both sides of the argument. There is nothing wrong with dredging in a responsible manner. It is another personal right that is being taken away from the American people! Please reinstate suction dredging

Rich Velasquez
Junction Ctiy, Ca 96048

12/1/09.

Dear Mark,

I am writing you to encourage a speedy SEIR. Since the environment hasn't changed since the last Study. This whole thing is over the Kanaks controling the Rivers. I own claims on Hayfork Creek.

This senario could happen in Colorado If the Tribe lived here.

The deer and Elk populations are down across the state. The coalition decides that the SKI AREAS are letting the upper slopes become packed from skiing activities. The baby grass can't come up in the spring time, to feed the young Deer & Elk. The Coalition files suit preventing the National forest to Issue any permits to any ski area, till a new E.I.R. is completed.

This is as Stupid as the problems in California have become.

Im spending my money in Idaho & Oregon this year.

Sincerely

970-260-0326.

Mark Stopher
California Department of Fish and Game
601 Locust Street
Redding, CA 96001

RE: Suction Dredge Permit Program - Can Logic Trump Science?

When can Logic trump Science? Whenever science cannot provide answers to the most basic and logical questions.

I have been a dredger in CA for over 20 years. I have abided every new law as it was adopted. I intend to abide by any new law adopted in this process. But there comes a time when pure logic should lead the intellect to the proper perspective. I fear that the overzealousness of the anti-dredging groups has now gone beyond logic. Let me explain.

Decline of salmon and other fisheries:

The DFG's own 2009 'decision' to open a limited season for the improved Salmon populations before dredging was even shut down in CA (SB 670) logically implies that dredging was not the cause of the problem. But rather, the annual slaughter of these fish by commercial, Indian, and individual fishermen was the cause.

New spawning beds produced by dredgers help the re-population of fisheries. Much like mother nature in her annual high water and random floods do, by creating new loose gravel beds. Why would anyone want to discourage dredgers from helping fish spawn?
I've heard the argument that the tailing piles are unstable. Well, so are natural gravel bed formations, until they are washed down by subsequent winter flooding that stablilizes them.

Mercury is a natural element:

Free mercury occurs in nature and is put into the air by coal fired power plants in the thousands of tons every year. The government in its wisdom has ordered that all incandescent bulbs be replaced with compact florescent lights (with mercury in them) by 2014. They actually are forcing Americans to bring toxic mercury into their homes.

In 20 years of dredging I have never encountered free mercury in my dredge. Only the occasional flake with mercury well stuck to it (since they have an affinity for each other).
I suspect each year I encounter no more mercury stuck to gold than what you might find in 5-6 CFLs. The difference is, I am removing the mercury from a river and water supply, and the government is adding tons of it to landfills and the water supply by act of law. So who is causing damage to the environment?

Methylated mercury occurs naturally:

Does mercury sucked into a dredge get methylated? If it does, how much is produced?

Modern dredges with a flare (vs crash box) design can catch a speck of gold so small you can barely see it with the naked eye? If it can do this it can also catch extremely small amounts of mercury. It does this because there is so little turbulence in the operation.
Mercury is thus nearly completely recovered from the river. Rather than being a hazard, dredging is actually a win win for the environment. The study that showed methylated mercury in the water downstream of a dredge surely did not test the water 1 mile, 2 miles or 10 miles downstream. If they had, do you think that they could detect any change from normal background levels for that stream? There is an EPA standard for safe mercury levels in water and fish etc. Does dredging create/surpass this? Consider that every decade or two mother nature produces a record flood that

churns up the entire bottom of a river or stream with massive material movement, which must easily produce a million times or more the amount of methylated mercury than gold dredging might have over that decade or two. Thus, of what significance is this issue?

I could go on and on. But I think you understand my point.

I only request that you let logical answers trump the science being offered when the science does not address the bigger and more appropriate questions.

Thank You

Richard Haynes
State of California
Retired Peace Officer
Bakersfield, CA
93313

From: Richard Parker <deeanrich@att.net>
To: <dfgsuctiondredge@dfg.ca.gov>
Date: 11/17/2009 2:51 PM

I feel like i got the shaft again. There is no sence in shunting down all dreging. On some of the coastal streams and rivers i understand. And the size of some of the nozzel,4 inch and under is recreational, and it is proven we do more good than bad. We do more to clean up rivers that any one else. Plus to charge for a permit than say you cant finish the season. This is just wrong. There is just a few tree hugers with a lot of money trying to stop anyone from havinng fun. Plus its against the federal law. We need to open some of the rivers , and limit the size of the dredges even as small as a three inch. That way you limit the big bad boys and let us enjoy the rivers with every one else.

Richard parker

A law abiding person and a tax payer

From: Richard Rockwell <raghorn@wildblue.net>
To: <DFGSuctionDredge@DFG.ca.gov>
Date: 11/5/2009 10:48 PM
Subject: Support Permanent Ban on Suction Dredging

Dear CA Department of Fish & Game Staff,

I'm writing this e-mail to ask that a permanent ban on suction dredging be applied
to all anadromous salmonid fisheries in the State of California. Anadromous salmonid
fisheries in California have been in steady decline now for decades. As fisheries scientists
and managers we have been able to point to a variety of reasons for these declines for many
years. However, due to legal and political responsiblities placed upon us by our society to
address all stakeholders in our fisheries' natural resources, we consistently fail to enact the
substantial measures necessary to make the changes required to stop and reverse the decline
of anadromous salmonids in The Golden State. One such activity potentially adding to
declines in the successful spawning of wild salmon and steelhead in our anadromous fisheries
is suction dredging still allowed by the DFG in rivers populated by remnant populations
of chinook and coho salmon. Yet unlike some other resource uses in our lotic fisheries, like
water allocation and use, it is an activity that is entirely within the DFG's power to regulate.

In my opinion, as long as chinook and coho runs are in decline in this state it is highly
inappropriate to allow the continuation of any in-river dredging in anadromous fisheries
where their populations struggle. Living along the Trinity River in Trinity County, I have
the opportunity to regularly witness DFG permitted dredging operations along many reaches
of this river that harbor prime salmon and steelhead holding, staging and spawning waters.
Since the timing of anadromous salmonids running up the Trinity and other rivers can vary
from year to year due to ocean influences, drought and other weather influences, and
fluctuations in dam releases, current seasons established by the DFG for dredging are
nowhere near stringent or flexible enough to keep these activities from altering streambeds
while threatened fish are in-river to stage and spawn. Since these regulations cannot practically
be altered on an annual or monthly basis to address annual or monthly fluctuations in the
timing of salmon and steelhead runs, such regulations will *always* be inadequate to protect

staging and spawning wild salmonid populations, and their resultant eggs, alevin, and fry, from negative impacts by suction dredging.

Therefore, I propose that all suction dredging in anadromous lotic fisheries in California be permanently banned until such time that our salmon and steelhead fisheries, through other substantial management changes to come, be well on the road to recovery to pre-determined goals approaching historic population levels. The use of suction dredges in anadromous fisheries, at current dangerously low salmon population levels, is no more appropriate than the use of hydraulic monitors in anadromous drainages in the late 1800's before laws were passed to remove their negative impacts on watersheds and their lotic ecosystems. Sadly for those whose livelihoods along the Trinity and other rivers have been supplemented by it, suction dredging at thisstage of California's statehood is an outdated and inappropriate practice in light of the fragile state of the Golden State's anadromous salmonid fisheries.

Thank you for your consideration.

Most sincerely,

Richard W. Rockwell, Ph.D.
Retired Aquatic Ecologist and Ecotoxicologist
Junction City, CA

From: Richard Rockwell <raghorn@wildblue.net>
To: <DFGSuctionDredge@dfg.ca.gov>
Date: 11/5/2009 10:58 PM
Subject: Support Permanent Ban on Suction Dredging (CORRECTED COPY)

Dear CA Department of Fish & Game Staff,

I'm writing this e-mail to ask that a permanent ban on suction dredging be applied to all anadromous salmonid fisheries in the State of California. Anadromous salmonid fisheries in California have been in steady decline for decades now. As fisheries scientists and managers we have been able to point to a variety of reasons for these declines for many years. However, due to legal and political responsiblities placed upon us by our society to address all stakeholders in our fisheries' natural resources, we consistently fail to enact the substantial measures necessary to make the changes required to stop and reverse the decline of anadromous salmonids in The Golden State. One such activity potentially

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while threatened fish are in-river to stage and spawn. Since these regulations cannot practically
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state of the Golden State's anadromous salmonid fisheries.

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Most sincerely,

Richard W. Rockwell, Ph.D.
Retired Aquatic Ecologist and Ecotoxicologist
Junction City, CA

From: "Wetzel" <wetzel36@infostations.com>
To: <dfgsuctiondredge@dfg.ca.gov>
Date: 11/11/2009 8:46 PM
Subject: Suction Dredging

My wife and I are suction dredge miners and we have dredged the Feather River in Northeastern California for the last 10 years. We certainly have enjoyed the beautiful canyon and we spend our summers looking for golden flakes and nuggets in this beautiful area of California. We are very upset that it is now against the law in California to suction dredge our valid Federal Mining Claims on the Feather River and that our federal right to mine for gold has been taken away.

In the 10 years we have been dredging, we have removed countless pounds of lead, metals(see below), and plastic bottles/bags etc., that are harmful to fish and our environment. We have seen first hand the massive amounts of trash and garbage thrown into the waterways by others. Not only are we sure to clean up after ourselves before leaving our claims, but we always clean up after others too.

Other relevant points to consider are:

* Just as fishermen, rafters, hunters, horsemen, recreationalists, OHV's and outdoors people have a right to enjoy the outdoors so should suction dredgers and this proposal will possibly strip this right away.
* Suction dredgers do not kill fish, their eggs or any other animals in the waterway.
* Dredgers do not destroy the bank of the waterways and stay inside the rivers.
* Our mining claims are right next to a highway and on the other side of the canyon is the railroad tracks so the trains, cars, trucks, semi trucks, RV's etc., already make noise.
* There is a very small population of dredgers at about 3,500 per year so the environmental impact, noise generated and time in the water is extremely small and the overhead to DFG to monitor them is minimal.
* No consideration is being given to the fact there are existing dams without fish ladders on most of the river systems so the Salmon are already stopped way down river.
* Dredgers are already regulated by the DFG through the permit process and we are further regulated on nozzle size, seasons and rivers/areas that we can go into.
* The 1872 Mining Law protects miner's rights to use the most proficient manner to process minerals from their Federal Mining Claims and when the claim is a water claim then dredging is the most efficient manner.

Thank you,

Richard and Laurie Wetzel

1250 Castle Creek Ranch Road

Newcastle, Ca 95658

Attn: Mark Stopher
California Department of Fish and Game
601 Locust Street
Redding, CA 96001

My wife and I are suction dredge miners and we have dredged the Feather River in Northeastern California for the last 10 years. We certainly have enjoyed the beautiful canyon and we spend our summers looking for golden flakes and nuggets in this beautiful area of California. We are very upset that it is now against the law in California to suction dredge our valid Federal Mining Claims on the Feather River and that our federal right to mine for gold has been taken away.

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Thank you,

Richard and Laurie Wetzel
1250 Castle Creek Ranch Road
Newcastle, Ca 95658

From: <Rdozier1@aol.com>
To: <dfgsuctiondredge@dfg.ca.gov>
Date: 11/11/2009 9:19 AM
Subject: My input on the EIR.

I will not be able to attend the meeting in West Sac, so I wanted to let you know my opinion of this subject.

I am all for the EIR, but, and that's a big "but". The EIR has to do with dredging in rivers that have spawning salmon in them. Somehow, DFG has decided to include every river in the state, regardless of the fact they have salmon running in them or not.
This is way out of scope. The EIR should focus on only those rivers that have salmon runs on them.
And to further point out the waste of this Idea of including all rivers, the output of a dredge, will not change, from river to river. You could do the EIR in one location, and apply that data to all the other rivers in the state. There is no need to look at all the rivers! This is a waste of ti me and money.

I request that the ban be lifted on those rivers that do not have salmon runs on them, while this EIR is being conducted as they are not involved with this issue at all.

And, one final thought. Seeing as This whole EIR mess is a result of the lawsuit filed by the Karuk Indian Tribe, based on the supposed damage done to spawning salmon, It would seem prudent to ban any activity, that damages the salmon run, until it is clear that the activity in question is not doing harm, therefore I feel it is imperitive to stop the wholesale slaughter of migrating salmon, by the mass netting done by the Indians.
If anything harms the salmon runs, it is CLEAR that their activity is harming the salmon runs much more than the supposed damage done by a dredge. And you don't need a EIR to figure that one out.

This whole issue needs to be handled in an even handed manner, where EVERYONE, is prohibited from harming the salmon, not just picking out the weak, small groups like dredgers, and letting the others run wild.
Since
rely,
Rick Dozier
7771 West Ranch Lane
Vacaville, CA 95688
707 628 3541

12/01/2009

Rick Eddy

5477 Russell Hollow Rd.

Pilot Hill, CA 95664

(530) 823-8658

reddy2ctsp@aol.com

Comments

- Section I, Pages 30-31

I see no real significant impact on the aesthetics. There is only one dredge for every 2,500 miles of rivers and streams in the entire state.

- Section III, Air Quality

How can 3,000 dredges throughout the state possibly exceed emissions that exceed quantitative thresholds for ozone precursors with all of the millions of cars and trucks on the road?

- Section IV, A, B, C, D

I see no substantial adverse effect on these issues. dredgers cannot work wetlands without proper flow of water.

- Section IV, Page 39, Spawning Habitat

The statement (Dredge tailings may offer attractive yet potentially less stable material for spawning than natural gravels.) should be removed from the EIR. Why? At this time DFG is putting gravel in the American River at Hazel Ave. below the bridge hatchery to promote spawning beds for salmon. This gravel is not as good as natural gravel. Tailings from dredging gets reworked every season and replaced by high water runoff. Besides which the reduced survival due to scouring is insignificant.

- Section IV, Page 41-42, Behavioral effects

The impact of noise on the fish in insubstantial compared to hundreds of boaters going down the river and yelling and slapping their oars on the water.

- Section IV, Page 42, 3rd Paragraph

Suction dredging dislocates and can kill aquatic insects. Yes, maybe but the fish will be there to eat them. Once again it is just one little area on a big river. It's not like the fish have to go clear to the next state to find another bug to eat. Insect recovery is rapid.

- Section IV, Page 58

Paragraph 1: Impacts due to dredging banks.

It is not legal, we do not do this

Paragraph 2: Removing trees should be illegal and undermining banks. My suggestion regarding fuel spills is to put drip pans under engines with highly absorbent material inside and use approved spill proof gas cans.

- Section V, Page 61, Disturbing human remains.

Please explain this.

Shipwrecks:

There should be a law that states any found shipwreck is monitored and a joint effort with an archeologist.

- Section VIII, Page 72, Paragraph 2, Floured Mercury

What is floured mercury? Gold suction dredging does not break up mercury and pass it through the sluice box. Mercury is concentrated into riffles.

Paragraph 3:

Discharges from dredges are less than 1%. Every time it floods mercury is stirred up one million times more than suction dredging ever will. There is a thousand times more mercury coming out of the Sacramento sewer plant into the river exceeding the regulatory standards.

- Section VIII, Page 74, Paragraph 3

This is confusing. Do resulting conditions still meet standards?

- Section XIII, A, Page 82

Fire protection: Suction dredges can be used to put out a fire.

Page 86: Rafters are in conflict with dredgers. They only have to put up with the noise for about 90 seconds when they go by. On the South Fork of the American River, we had about 60 percent of the rafting guides stopping at our dredge to show their clients our gold and operation as part of the river experience. We all go along just fine. Regarding the fishermen; if they would fish right behind the dredge it would greatly improve their fishing success. Let's relive conflicts between designated uses.

- Section XVIII, Page 91, A

Does the project have the potential to degrade or substantially reduce the habitat of fish and wildlife? No, it has not and there is still no scientific evidence as of yet. Currently, the endangered species are suction dredgers.

- Question: If the fluctuation flows on the South Fork of the American River are causing a poor spawning environment for trout, then why did D.F.G. close it for winter spawning?

NOV 22 2009
PO Box 382
Sierra City, Ca. 96125
Robert Hammett

Dear Sirs,

I'm Replying To Moratoriun on Dredgeing
For Twenty years Ive been dredge mining and never Killed any Fish Fisherman Kill Fish., nor have ~~damande~~ Damaged Any STream or River.
As A miner I Respect all laws and I Respect the land & water I keep a clean area no Trash while Dreadgeing we are removing lead Mercury glass Steel and Fishline Trash From waterways & land By Bagging it up & Taking it out. Dreadgeing is regulated and is enviromentaly Friendly also 1872 mining laws give us the right to mine If it was'nt You Would have Shut it down long ago.

Respectfully
Robert Hammett

From: Robert Lyss <roblyss@hotmail.com>
To: <dfgsuctiondredge@dfg.ca.gov>
Date: 12/3/2009 3:01 PM
Subject: Public Comment on Suction Dredge Mining

I am writing as a member of the public in my opposition to the practice of Suction Dredge Mining, and in support of a permanent moritorium on the practice.

My family owns land on one of the affected waterways in the Sierras. Despite the area's long-time mining history, the ownership of this landscape has changed dramatically over the years. It is now largely residential, with landowners using our local river for recreation, fishing, etc.

Suction dredging of this waterway affects water quality for miles downstream, creates a hazardous environment for traversing the river due to large levels of silt, and affects nearby homeowners with noise pollution from the dredger's engine or engines.

The Dredge Miners in this particular area are rarely (if at all) owners of this river-front property area. Suction Dredge Mining is essentially a hobbyist activity today, and considering the major negative impacts this practice imposes on the actual landowners of the area, I would like to see it stopped permanently.

Windows Live Hotmail gives you a free,exclusive gift.
http://www.microsoft.com/windows/windowslive/hotmail_bl1/hotmail_bl1.aspx?ocid=PID23879::T:WLMTAGL:ON:WL:en-ww:WM_IMHM_7:092009

SUCTION DREDGE PERMITTING PROGRAM
Subsequent EIR - CEQA Scoping Comment Form

Name: Robert W Stumbo

Mailing Address: 2245 Coyote Creek Rd.
Wolf Creek, Oregon - 97497

Telephone No. (optional): 541-866-2514

Email (optional):

Comments/Issues:

Here are the results of some studies done by very credibale people with their sources. I hope this information will help you in your dicision. I would also like to tell you that I think what you are doing is a violation of Federal law and by engagin in this activity you are becoming conspirators in the violation.

Please use additional sheets if necessary.

SUBMIT WRITTEN COMMENTS (POSTMARKED BY 12/03/09) TO:

Mail: Mark Stopher
California Department of Fish and Game
601 Locust Street
Redding, CA 96001

Email: dfgsuctiondredge@dfg.ca.gov

Website: www.dfg.ca.gov/suctiondredge

Questions? Please call us at (530) 225-2275

WHEREAS, Joseph C. Greene, a retired Research Biologist from the United States Environmental Protection Agency stated in a letter dated June 6, 2007, to the California State Water Resource Control Board that suction dredging moves a miniscule amount of in-stream material such as sand, gravel and silt compared to any high water event in a given year and has little if any negative effects on our rivers and streams; and

State Water Resources Control Board
Division of Water Quality
P.O. Box 100
Sacramento, California 95812-0100
Fax: 916-341-5620
email: commentletters@waterboards.ca.gov

June 6, 2007

Subject: **SUCTION DREDGE MINING**

Dear Board Members,

Thank you for allowing me this opportunity to comment on the water quality aspects of small-scale suction dredge mining.

As I have searched the scientific literature for studies on the effects of small-scale suction dredge mining on the environment I have learned that the preponderance of the published research studies have been directed towards assessment of its effect on the biology of the streams and rivers. In nearly every instance the results have concluded that the effects were less than significant.

In water quality terms some studies have discussed turbidity, water temperature, and suspension of heavy metals into the overlying water. I will focus my water quality comments on these three areas. But first I would like to put this issue in to perspective.

GEOGRAPHICAL SCALE OF SMALL-SCALE SUCTION DREDGING

It has been observed that environmentalists opposing suction dredging use data gleaned from reports that studied effects of environmental perturbations that are occurring on a system-wide basis. For example, they would characterize the affects of turbidity from a suction dredge as if it would impact downstream organisms in a manner that system-wide high water flow events might. This approach is entirely inconsistent with the way in which suction dredges operate or generally impact their downstream environment.

The California Department of Fish and Game (1997) described typical dredging activities as follows' "An individual suction dredge operation **affects a relatively small portion of a stream or river**. A recreational suction dredger (representing 90-percent of all dredgers) may spend a total of four to eight hours per day in the water dredging an area of 1 to 10 square meters. The average number of hours is 5.6 hours per day. The remaining time is spent working on equipment and processing dredged material. The area or length of river or streambed worked by a single suction dredger, as compared to total river length, is relatively small compared to the total available area."

In the Oregon Siskiyou National Forest Dredge Study, Chapter 4, Environmental Consequences, some perspective is given to small-scale mining. "The average claim size is 20 acres. The total acreage of all analyzed claims related to the total acres of watershed is about ***0.2 percent***. The average stream width reflected in the analysis is about 20 feet or

0

less and the average mining claim is 1320 feet in length. The percentage of land area within riparian zones on the Siskiyou National Forest occupied by mining claims is estimated to be only ***0.1 percent***." The report goes on to say, "Over the past 10 years, approximately 200 suction dredge operators per season operate on the Siskiyou National Forest" (SNF, 2001).

6

A report from the U.S. Forest Service, Siskiyou National Forest (Cooley, 1995) answered the frequently asked question, "How much material is moved by annual mining suction dredge activities and how much does this figure compare with the natural movement of such materials by surface erosion and mass movement?" The answer was that suction dredges moved a total of 2,413 cubic yards for the season. Cooley (1995) used the most conservative values and estimated that the Siskiyou National Forest would move 331,000 cubic yards of material each year from natural causes. Compared to the 2413 (in-stream) cubic yards re-located by suction mining operations the **movement rate by suction dredge mining would equal *about 0.7% of natural rates***.

It has been suggested that a single operating suction dredge may not pose a problem but the operation of multiple dredges would produce a cumulative effect that could cause harm to aquatic organisms. However, "No additive effects were detected on the Yuba River from 40 active dredges on a 6.8 mile (11 km) stretch. The area most impacted was from the dredge to about 98 feet (30 meters) downstream, for most turbidity and settleable solids (Harvey, B.C., K. McCleneghan, J.D. Linn, and C.L. Langley, 1982). In another study, "Six small dredges (<6 inch dredge nozzle) on a 1.2 mile (2 km) stretch had no additive effect (Harvey, B.C., 1986). *Water quality was typically temporally and spatially restricted to the time and immediate vicinity of the dredge* (North, P.A., 1993).

A report on the water quality cumulative effects of placer mining on the Chugach National Forest, Alaska found that, "The results from water quality sampling do not indicate any strong cumulative effects from multiple placer mining operations within the sampled drainages." "Several suction dredges probably operated simultaneously on the same drainage, but did not affect water quality as evidenced by above and below water sample results. *In the recreational mining area of Resurrection Creek, five and six dredges would be operating and not produce any water quality changes* (Huber and Blanchet, 1992).

The California Department of Fish and Game stated in its Draft Environmental Impact Report that "Department regulations do not currently limit dredger densities but the activity itself is somewhat self-regulating. Suction dredge operators must space themselves apart from each other to avoid working in the turbidity plume of the next operator working upstream. *Suction Dredging requires relatively clear water to successfully harvest gold* " (CDFG, 1997).

Management of the Fortymile River region (a beautiful, wild and scenic river in the remote part of east-central Alaska) and its resources is complex due to the many diverse land-use options. Small-scale, family-owned gold mining has been active on the Fortymile since the "gold rush" days of the late 1880's. However, in 1980, the Fortymile River and many of its tributaries received Wild and Scenic River status. Because of this status, mining along the river must compete with recreational usage such as rafting, canoeing, and fishing.

A press release from the U. S. Geological Survey stated, in part, the following, "The water quality of the Fortymile River-a beautiful, ...has not been adversely impacted by gold placer mining operations according to an integrated study underway by the U.S. Geological Survey and the Alaska Department of Natural Resources.

Violation of mining discharge regulations would close down the small-scale mining operations. No data existed before this study to establish if the mining was degrading the water quality. However, even with the absence of data, environmental groups were active to close down mining on the river citing unsubstantiated possible discharge violations.

This study has found no violations to date to substantiate closure of the small-scale mining operations. The result is a continuance of a way of life on the last American frontier." (U.S. Geological Survey October 27, 1998). I have no doubt that this is the real issue currently facing small-scale gold suction dredgers in California.

Suction dredges do not add pollution to the aquatic environment. They merely re - suspend and re-locate the bottom materials (overburden) within the river or stream.

I hope this scientific research information I have provided will be helpful in your efforts regarding suction dredge mining and water quality. I thank you for this opportunity to submit this data.

Respectfully Yours,

Joseph C. Greene
Research Biologist, U S. EPA Retired

LITERATURE CITED

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WHEREAS, on August 20, 2009, in a letter by Claudia Wise, a retired physical scientist/chemist with the United States Environmental Protection Agency, refers to the California State Water Board's Water Quality Division report (Humphreys, 2005), which indicates that suction gold dredging effectively removes at least 98% of the measured mercury processed through the dredge, and suggests it is right to look to the suction dredge community for help in locating hotspots and removing mercury from the river systems; and

Truths about Dredging and effects on Fish Habitat

TIME \@ "MMMM d, yyyy" August 20, 2009

The Honorable Governor Arnold Schwarzenegger

State Capitol Building
Sacramento, CA 95814

Fax: 916-558-3160

Dear Governor Schwarzenegger,

PLEASE VETO BILL SB670 (anti-suction dredging legislation)

My name is Claudia Wise; I retired in 2006 after 32 years of civil service with the U.S. EPA as a physical scientist/chemist. I have been a member of many scientific projects over the years starting my federal career in the Fish Toxicology arena and ending it with the Salmon Restoration division. I have worked on projects ranging from urban fish populations and fish avoidance testing to eelgrass habitat and global climate change. I have been and remain to be a strong proponent of protecting the environment.

On October 11, 2007 in regards to AB 1032 I wrote to you regarding another attempt by the legislature to get around a court order and unnecessarily put a large group of miners and businesses out of work with no scientific evidence to support their claims.

Dozens of peer-reviewed journal articles some commissioned by the USEPA, USGS, CDFG, Corp of Engineers, and many more from universities support suction dredging as having *de minimis* effects or no significant effect on the environment they are used in. Nothing has changed in peer-reviewed literature since that time to change this fact.

Suction dredge mining has little impact on the areas fish and biota. In relation to natural occurrences suction dredge mining is insignificant. To put the impact of suction dredge mining into perspective it was calculated that suction dredge mining disturbs only 0.7% of the sediment that is moved naturally in a year. The Siskiyou National Forest (SNF), where this study occurred, is a very prominent mining area in California.

According to the U. S. Forest Service, SNF, "There are 1,092,302 acres on the Siskiyou National Forest. Using a factor of 0.33 cubic yards per acre per year times 1,092,302 acres will produce a very conservative estimate that 331,000 cubic yards of material move each year from natural causes compared to the 2413 cubic yards that was moved by suction dredge mining operations in 1995. This would be a movement rate by suction dredge mining that equals about 0.7% of natural rates." (Cooley 1995).

California Department of Fish and Game already regulates the miners out of the waterways during important life events for the Salmon. That includes during spawning season when redds are present.

It is well known that suction dredging causes little or no environmental harm to fish and biota what many overlook are the many benefits that dredging provides such as increased spawning gravels, dredge made refugia, and yes, mercury remediation to name a few.

Suction dredging breaks up cemented riverbeds providing fish with loose gravel for future spawning grounds in areas fish presently are not able to use for spawning. Between 1996 and 1998, Quihillalt (1999) found 4% of redds where located on or within 1000 m of dredge tailings. He theorized that dredge tailings may be attractive sites for redd construction because tailings are often located near riffle crests where fish frequently spawn, and they provide loose, appropriately sized substrate. However, embryos in tailings may suffer high mortality during years of high river flows (1998) and be of no concern during years of low river flows (1996 & 1997).

During a later survey on the Klamath River during 2002 only one redd was observed on suction dredge tailings. Recreational suction dredge mining was present throughout the survey from the Highway I-5 Bridge to Happy Camp (Schuyler and Magneson. 2006).

Even with scouring effects to redds reported in scientific literature this gravel provides areas to spawn that would not otherwise be available to them. Any added benefit to increasing salmon productivity, using suction dredging, is a benefit to fish numbers. Even during years of high mortality due to high flow events if only a few of the embryos survive that may be more than would be expected without the benefit of added spawning gravels provide by the tailings.

I have been involved in temperature surveys on the Klamath River in California in regards to suction dredge activity and existing conditions of refugia. We have found natural refugia to be no better in many cases to that of dredge made refugia.

Dredge holes can provide a holding place for fish as they pass up the waterway on their migration path to and from the ocean providing a place to get out of the faster currents to rest. Some of these dredge holes may also be cooler due to ground water seepage if the holes are deep enough. This leads to development of additional areas of needed refugia.

Another Benefit the suction dredge community could provide the state with is mercury remediation. In talking with miners, the majority typically do not run into large pools or hot spots of mercury. However, their concerns for the environment is the same as other citizens. Miners have shown the willingness to hand over collected mercury to a collection facility if such a facility exists. The California State Water Board's Water Quality Division report (Humphreys, 2005) suggested the idea of paying the miner's for their efforts would help facilitate this plan. Collection facilities have been provided in the past with great response.

The California Water Board has spent a lot of time and money on mercury remediation projects with limited success, though in 2001 EPA Region 9 located in San Francisco, California did collect mercury from miners very effectively. Collections of mercury has been happening in Oregon and Washington through the states respective Division's of Ecology and with even greater success at miner's rallies.

Even though EPA Region 9 has ended this program and removed it's existence from the website EPA, Region 9 had a mercury "milk run" in 2000. Agency personnel were able to collect 230 pounds of mercury from miners and local dentists. The total amount of mercury collected was equivalent to the mercury load in 47 years worth of wastewater discharge from the city of Sacramento's sewage treatment plant or the mercury in a million mercury thermometers. (US EPA, 2001.)

Over the past four years, the Resources Coalition and other small-scale miners associations in Washington have turned in 127 pounds of mercury and eight pounds of lead for safe disposal with the help from the Washington Department of Ecology. Ecology staff attended miners' rallies in Oroville and Monroe, explaining the state's program for proper disposal of lead and mercury. (ENS 2007).

The mining community of today is, in my opinion, the only group that is in a position with the technology to help with the removal of lead and mercury at a very economical price to the public. Any residual mercury remaining after dredging is that much less to worry about residing in our Nations waterways.

In reviewing Humphrey's (2005) comments regarding possible problems associated with collecting mercury via suction dredging methods, it is right to look to the suction dredge community for help locating hotspots and removing mercury from the river systems. In my opinion the data provided in the report by Humphrey's (2005) did not demonstrate any clear conclusions that would prohibit the State from allowing this activity. On the contrary, in the discussion of results it was stated that a suction dredge in the American River was able to collect 98 percent of the measured mercury processed through the dredge. The amount of mercury collected may have been higher if the investigators had been using a dredge with the modern jet flare design. Even 98 percent is a huge plus for the environment and it would be irresponsible to not allow mercury to be removed from the rivers and streams whenever it is found.

In Humphreys report (2005), the author expressed concern for the loss of a small portion (2%) of the mercury from the back end of the sluice box. In the conclusions it was stated that the amount lost constituted a concentration more than ten times higher than that needed to classify it as hazardous waste. Yet 98 percent of the mercury was now secured and the process did not add any mercury to the system that was not already present. The small fraction lost, because of its density, would relocate back onto the river floor buried in the sediment close to where it was removed while dredging.

Mercury is continuously moved every winter in high storm events. Since the cessation of hydraulic mining, accumulated sediment from hydraulic placer mining has been

transported to the Sacramento–San Joaquin Delta and San Francisco Bay by sustained remobilization (James, 1991). Providing a program to collect mercury from miners would aid the Water Board's mission of reducing mercury contamination in the deltas and bays where mercury methylation is a large concern.

In the test described by Humphreys (2005) a small portion of floured mercury was collected in the sediments as it escaped the sluice box. This mercury whether floured before it entered the sluice box, or not, would still be in elemental form. Regardless of surface area it would be no more toxic then the other 98 percent that was suggested to be left in place.

Aside from grossly polluted environments, mercury is normally a problem only where the rate of natural formation of methyl mercury from inorganic mercury is greater than the reverse reaction. Methyl mercury is the only form of mercury that accumulates appreciably in macroinvertebrates and fish. Environments that are known to favor the production of methyl mercury include certain types of wetlands, dilute low-pH lakes in the Northeast and North central United States, parts of the Florida Everglades, newly flooded reservoirs, and coastal wetlands, particularly along the Gulf of Mexico, Atlantic Ocean, and San Francisco Bay (USGS 2000).

If not collected the mercury is guaranteed to end up farther down stream, and eventually in the delta or the bay, where methylation is a real environmental problem. In my opinion it would be a highly irresponsible management practice to leave a large portion of mercury in the rivers and streams because of unrealistic concerns for the lesser amount moving only a short distance away from an operating dredge. Most likely if floured the movement of fine mercury would extend no farther than 50-feet off the end of the sluice box. That would relate to the distance a turbidity plume might extend downstream from a small-scale suction dredge.

However, if the mercury was left in place the next storm event would surely move it downstream closer to, and eventually into, the bay and delta. In fact, according to Humphrey's study in 2005 mercury was seen moving down stream and re-deposited on bedrock already dredge cleaned. The important fact here is mercury was flowing down stream in a suction dredge free zone during lower river flows than what take place under high winter river conditions.

It is most important to reduce the total amount of mercury in the streams and rivers and its transport downstream into the bays and deltas. This is defined as a part of Total Maximum Daily Load ("TMDL") goals.

We know for certain that mercury is transported downstream throughout the winter season during high water events. Therefore, anytime there is the possibility for the removal of mercury by miners it should be undertaken and supported.

You justifiably vetoed that last bill because it was unnecessary and suction dredge mining is already regulated by the Department of Fish and Game. But here we are again….

There was no reason, last year, to sign AB1032 into law and there is no reason to sign Bill 670 into law this year. I respectfully ask that you not add further to the problems related to increased government regulation where none is warranted. Please allow California Fish and Game to do their job. They are already regulating suction dredging adequately to protect fish. The court has ordered California Department of Fish and Game to prove suction dredging creates significant harm before changing the mining regulations.

I respectfully ask that you VETO bill 670.

Sincerely,

Claudia Wise

34519 Riverside Dr SW

Albany, Oregon 97321

541-990-7009

REFERENCES

Cooley, 1995, USFS. Siskiyou National Forest Service Yardage Estimate, **A comparison of stream materials moved by mining suction dredge operations to the natural sediment yield rates.** In house Report.

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USGS, 2000. Mercury in the Environment, USGS Fact Sheet 146-00 (October 2000) **Environments Where Methyl mercury is a Problem.**

SUCTION DREDGE PERMITTING PROGRAM
Subsequent EIR - CEQA Scoping Comment Form

Name: Roland Brady

Mailing Address: 2703 N Adoline
Fresno, CA 93705

Telephone No. (optional):

Email (optional): bvrady-geology@msn.com

Comments/Issues:

Much is being made of dredging effects on substrate relative to life cycle of salmonids. However, what I am not seeing is info on dredging effects on macro-invertebrates' life cycles which support the fish, this could be even more important than impacts on fish directly

Please use additional sheets if necessary.

SUBMIT WRITTEN COMMENTS (POSTMARKED BY 12/03/09) TO:

Mail: Mark Stopher
California Department of Fish and Game
601 Locust Street
Redding, CA 96001

Email: dfgsuctiondredge@dfg.ca.gov

Website: www.dfg.ca.gov/suctiondredge

Questions? Please call us at (530) 225-2275

Quality Assurance Project Plan

Effects of Small-Scale Gold Dredging on Metals Concentrations in the Similkameen River

by
Art Johnson

Washington State Department of Ecology
Environmental Assessment Program
Olympia, Washington 98504-7710

July 2004

Publication No. 04-03-108

This plan is available on the Department of Ecology home page on the World Wide Web at *http://www.ecy.wa.gov/biblio/0403108.html*.

Any use of product or firm names in this publication is for descriptive purposes only and does not imply endorsement by the author or the Department of Ecology.

Ecology is an equal-opportunity agency. If you have special accommodation needs, contact Carol Norsen at 360-407-6696 (voice) or 711 or 1-800-877-8973 (TTY).

Quality Assurance Project Plan

Effects of Small-Scale Gold Dredging on Metals Concentrations in the Similkameen River

July 2004

303(d) listings addressed in this study:
Similkameen River (WA-49-1030) – Arsenic

Ecology EIM number: AJOH0045

Approvals

Approved by:	6-25-04
Mark Peterschmidt, Client, Central Regional Office	Date
Approved by:	6-30-04
Jeff Lewis, Unit Supervisor, Central Regional Office	Date
Approved by:	6-25-04
Tom Tebb, Section Manager, Central Regional Office	Date
Approved by:	6-24-04
Art Johnson, Principal Investigator, Watershed Ecology Section	Date
Approved by:	6-24-04
Dale Norton, Unit Supervisor, Nonpoint Studies Unit	Date
Approved by:	6-24-04
Will Kendra, Section Manager, Watershed Ecology Section	Date
Approved by:	6-25-04
Stuart Magoon, Director, Manchester Environmental Laboratory	Date
Approved by:	6-30-04
Cliff Kirchmer, Ecology Quality Assurance Officer	Date

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Abstract

A plan is described for obtaining metals and ancillary water quality data on the impact of small-scale gold dredges operating on the Similkameen River, a tributary to the Okanogan River in North Central Washington State. The metals of interest are arsenic, copper, lead, and zinc. Approximately 70 samples of dredge effluents, the dredge plume, and ambient river water will be collected. Clean sampling techniques and low-level analytical methods will be used.

Background

The Similkameen River is located in North Central Washington (Figure 1). During the public comment period on the Similkameen River Arsenic TMDL (Peterschmidt and Edmond, 2004), concerns were raised by the community and the Colville Confederated Tribe regarding the potential impact of small-scale gold dredging on arsenic concentrations in the river. An earlier laboratory simulation conducted by the Washington State Department of Ecology (Ecology) had concluded that metals concentrations would be rapidly diluted downstream of a dredge (Johnson, 1999). The applicability of these data to field conditions was called into question.

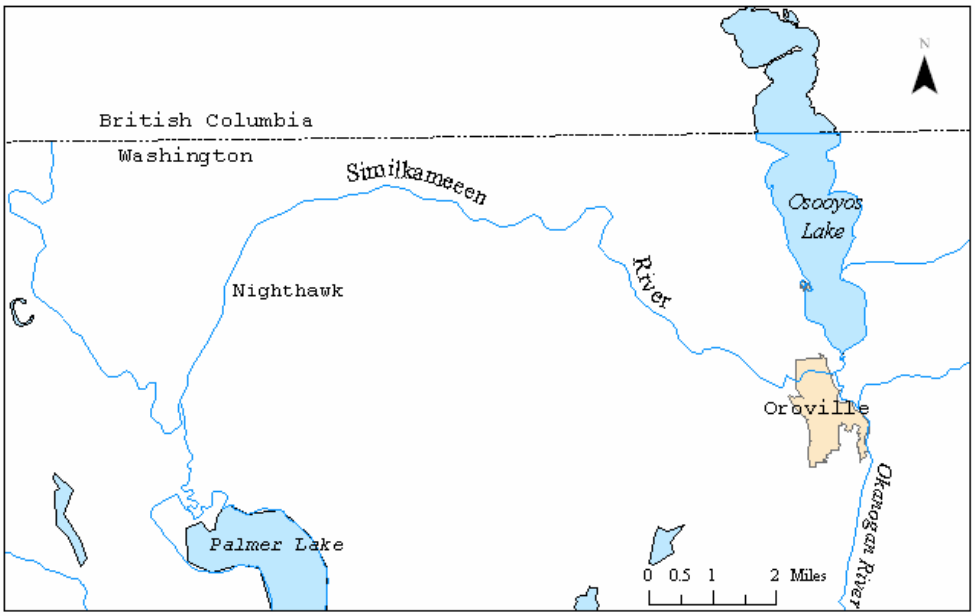

Figure 1. The Similkameen River

Dredging activities have been traditionally allowed on the Similkameen under mineral prospecting leases from the Washington State Department of Natural Resources (DNR). It is hard to quantify the amount of dredging activity that goes on. The Ecology Central Regional Office (CRO) has observed 20 or more rigs along the river at one time, although only a few of them were in operation (Mark Peterschmidt, Personal Communication). There are no restrictions on where dredging can be done.

The Department of Fish and Wildlife (WDFW) is the lead agency regulating small-scale mining and prospecting. Their *Gold and Fish* pamphlet constitutes the Hydraulic Project Approval permit that small-scale prospectors and miners must comply with when conducting activities covered in the pamphlet. Exceptions to the pamphlet, authorization for other mining and prospecting activities, or use of other equipment types than authorized by the Gold and Fish pamphlet can be granted through issuance of a written Hydraulic Project Approval. Among other regulations in the *Gold and Fish* pamphlet, WDFW requires a minimum 200-foot

separation between dredges. The role of Ecology in this activity is to administer water quality standards to prevent interferences with, or harm to, beneficial uses of the river.

A typical, commercially available dredge is pictured in Figure 2 (http://www.keeneengineering.com/pamphlets/howdredge.html). The pictured dredge likely has a 4" diameter intake nozzle. These are the maximum allowed under authority of the *Gold and Fish* pamphlet and are typically used by small-scale prospectors and miners. Larger dredges can and have been permitted on the Similkameen River, and are typically used by miners operating on a commercial basis.

Figure 2. A Typical Gold Dredge

Except for arsenic, the level of chemical contamination (both metals and organics) in Similkameen River sediments is relatively low (Johnson and Plotnikoff, 2000; Colville Confederated Tribe, Unpublished Data). Arsenic concentrations generally range from 10-50 mg/Kg* (Figure 3). Samples in the vicinity of Nighthawk and Oroville have exceeded a recently proposed Washington State sediment quality guideline of 20 mg/Kg for protection of aquatic life (Avocet Consulting, 2003). Most Washington rivers and streams have less than 10 mg/Kg arsenic in the sediments.

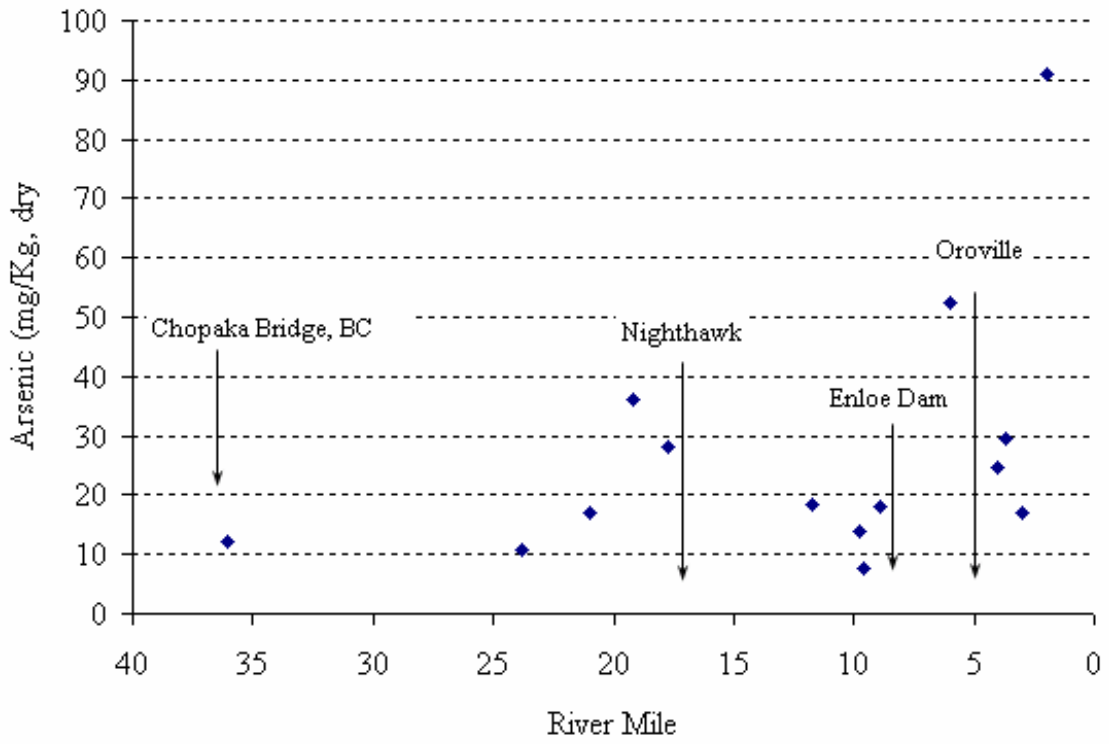

Figure 3. Arsenic Concentrations in Similkameen River Sediments [from Johnson, 2002]

Arsenic is also elevated in the Similkameen water column, with concentrations of 1.0 – 5.0 ug/L** typically being encountered (Johnson, 2002). The technical study conducted for the arsenic TMDL concluded that the major source of arsenic was tailings from historical mining activity in British Columbia (Johnson, 2002). Resuspension of contaminated sediments was identified as a potentially important source of arsenic to the water column. The arsenic concentrations in the Similkameen River exceed the federal human health criteria of 0.018 and 0.14 ug/L but are well within the state aquatic life criteria of 190 and 360 ug/L (see Table 1). The human health criteria are based on a one-in-one million excess cancer risk from consuming fish and water or fish only.

* parts per million
** parts per billion

In the absence of dredging, arsenic has previously been shown to increase slightly going downstream from Nighthawk to Oroville (Figure 4). The Palmer Lake outlet at r.m. 19.5 is a major source of arsenic to the lower river.

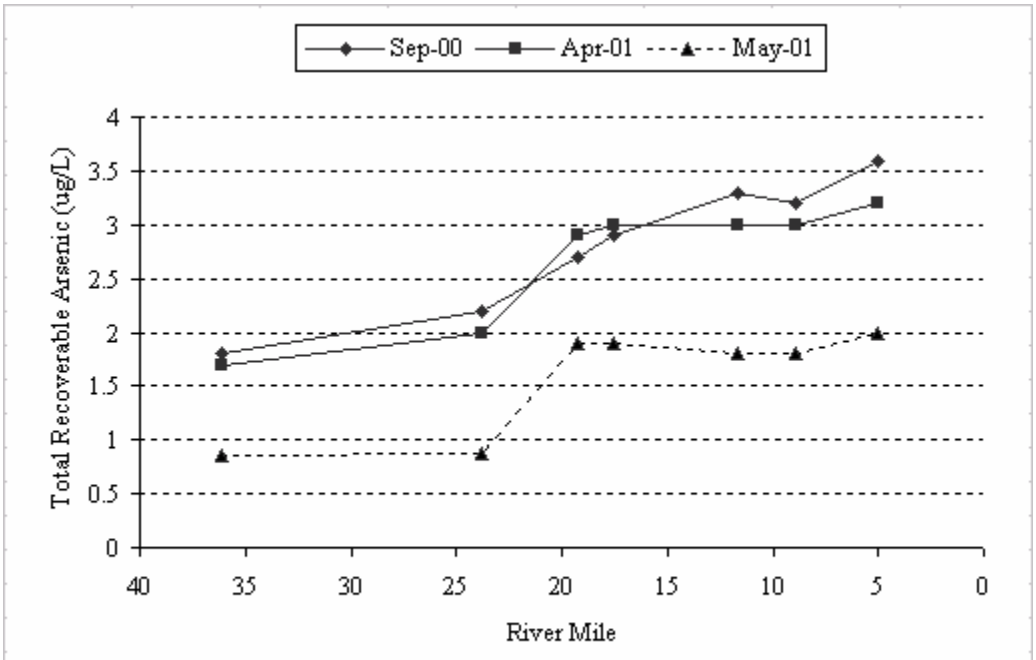

Figure 4. Arsenic Concentrations in Similkameen River Water [from Johnson, 2002]

The previously mentioned dredging simulation study conducted by Ecology involved mixing predetermined amounts of river water and sediment to approximate a dredged material slurry (the Elutriate Test Described in Plumb (1981)). After shaking for 30-minutes, the supernatant from the mixture was allowed to settle, and then filtered and analyzed. The samples used in the test were obtained near Eagle Rock (r.m. 11.7) and just above Enloe Dam (r.m. 8.9), areas where dredging was either underway or planned. Arsenic concentrations were 14-18 mg/Kg in the bulk sediments and 3.9 ug/L in the river water.

Results of the simulation showed that arsenic, copper, lead, and zinc were the metals of primary interest. Arsenic concentrations in the elutriate were 5-10 times higher than the river water used for the test. Copper and lead exceeded aquatic life criteria by factors of 2-4. Zinc approached half its aquatic life criteria values. (There are no human health criteria for copper, lead, or zinc equivalent to the arsenic human health criteria.) A point source dilution model applied to these data suggested that at least a five-fold dilution would occur immediately downstream of a dredge during low flow conditions. It was concluded that water quality concerns were probably negligible for metals, at least with respect to individual dredges.

This coming August 18-21, the Resources Coalition will hold a rally on the Similkameen River (http://www.inlinks.net/def2003.html). The rally is being organized to allow the public to meet, participate, and learn about small-scale mining and prospecting by participating in these activities with miners. Representatives from regulatory agencies have been invited to attend. There is a current proposal to use up to three dredges with 8" diameter intake nozzles to operate closer than 200' from each other during the rally.

Project Description

In response to community and tribal concerns, Ecology concluded that a field study should be conducted to obtain water samples in the vicinity of small-scale dredges operating on the Similkameen River. The objectives of the study will be to determine if dredging: 1) exacerbates current exceedances of the human health standard for arsenic or 2) results in violations of the aquatic life standards for arsenic, copper, lead, or zinc.

Ecology will use these data to make an initial determination as to whether dredging activities are likely to cause a violation of water quality standards under the conditions observed. Results of the field study will be provided to regulatory agencies and the public. Given the variability inherent in a gold dredging operation and limited number of samples being collected for this study, the results should not be considered conclusive.

Three types of samples will be collected for the study: dredge effluents, dredge plumes, and ambient river water. Effluents will be sampled from fifteen dredges operating in different parts of the river. The turbidity plume downstream of three of the dredges will be sampled at selected distances to gauge the downstream extent of the impacted area. Finally, samples will be collected upstream of where the dredges are working to determine background concentrations for the metals of interest.

Clean sampling techniques and low-level analytical methods will be used to analyze arsenic, copper, lead, and zinc. Turbidity, total suspended solids (TSS), hardness, and pH will also be measured. Flow data will be obtained from the U.S. Geological Survey and Ecology gauging stations at Nighthawk and Oroville, respectively.

Field work will be conducted during July-September, 2004. The study will be conducted by the Ecology Environmental Assessment (EA) Program with field assistance provided by CRO. The samples will be analyzed by the Ecology Manchester Environmental Laboratory.

Organization, Schedule, and Cost Estimate

Organization

EAP Project Lead	Art Johnson, EAP (360-407-6766)
CRO Client/Field Assistance	Mark Peterschmidt (509-454-7843)
EAP Toxics Studies Unit Supervisor	Dale Norton (360-407-6765)
Manchester Environmental Laboratory Director	Stuart Magoon (360-871-8801)
Manchester Laboratory Inorganics Unit Supervisor	Dean Momohara (360-871-8808)
Ecology Quality Assurance Officer	Cliff Kirchmer (360-407-6455)

Ecology Environmental Information Management System (EIM) data entry – Carolyn Lee

Schedule

July-September, 2004	Field work conducted and samples submitted to laboratory.
November 2004	Laboratory analyses completed and data reported to project lead.
February 2005	Draft report completed.
March 2005	EIM data entry completed.
March 2005	Final report completed.

Cost Estimate

The laboratory cost for this project is estimated at $11,000 (50% discounted price at Manchester Laboratory; true cost is 2X).

Quality Objectives

The applicable water quality criteria for metals are shown in Table 1. For hardness-dependent criteria (copper, lead, and zinc) the lowest value recorded for the Similkameen River at Oroville was used to calculate the criterion (http://www.ecy.wa.gov/programs/eap/flow/shu_main.html). Criteria concentrations increase with increasing hardness.

Table 1. Applicable Water Quality Criteria for Metals (ug/L)

	Aquatic Life Criteria*		Human Health Criteria**	
	Acute	Chronic	Fish + Water Consumption	Fish Consumption
Arsenic	360	190	0.018	0.14
Copper	7.7	5.5	- -	- -
Lead	25	0.99	--	- -
Zinc	56	51	- -	- -

*dissolved metals at 43 mg/L hardness
**inorganic arsenic

The Class A turbidity criterion (173-201A WAC) also applies in this case and states that "Turbidity shall not exceed 5 NTU over background turbidity when the background turbidity is 50 NTU or less, or have more than a 10 percent increase in turbidity when the background is more than 50 NTU."

A performance based approach was followed for defining measurement quality objectives (MQOs) for this project (Table 2). The MQOs are Manchester Laboratory's acceptance and reporting limits for the analyses selected.

Table 2. Measurement Quality Objectives

Parameter	Check Standards/ LCS (recovery)	Duplicate Samples (RPD*)	Matrix Spikes (recovery)	Matrix Spike Duplicates (RPD)	Required Reporting Limits
Arsenic	85-115%	20%	75-125%	20%	0.1 ug/L
Copper	85-115%	20%	75-125%	20%	0.1 ug/L
Lead	85-115%	20%	75-125%	20%	0.02 ug/L
Zinc	85-115%	20%	75-125%	20%	0.5 ug/L
Hardness	85-115%	20%	75-125%	20%	1 mg/L
TSS	80-120%	20%	N/A	N/A	1 mg/L
Turbidity	80-120%	20%	N/A	N/A	0.5 NTU

*RPD = relative percent difference

Reporting limits this low are needed to quantify background metals concentrations in the Similkameen River. The metals reporting limits for this project are lower than the aquatic life criteria by more than an order of magnitude and should, therefore, easily suffice for identifying exceedances of metals standards. Because the Similkameen already substantially exceeds the human health criteria for arsenic, compliance is not a reporting limit issue. The 0.5 NTU reporting limit for turbidity is an order of magnitude below 5 NTU, sufficiently low to assess violations of the criterion.

Design of Field Study

The field study will occur during July through September, 2004. Monthly average river flow during this period ranges from 3,029 cfs (July) to 600 cfs (September).

Three field trips are planned. The first samples will be collected soon after the mineral prospecting work window through the *Gold and Fish* pamphlet opens on July 1. The second sample set will be collected during the Resources Coalition rally in August. A third set of samples will be collected during September low flow. CRO is coordinating the field work with rally organizers, participating miners, and WDFW.

Dredge Effluents

Dredging primarily occurs from a few miles above Nighthawk down to Oroville near the mouth of the river (see Figure 1). To the extent possible, the locations sampled will be selected to give results that represent this entire reach. Likely access points are r.m. 19, 14.5-16, 11.8, 9-10.5, and 4-5.5 (Mark Peterschmidt, CRO, Personal Communication). CRO is seeking permission to obtain samples from dredges that plan to operate in these areas. The discharges from up to15 dredges will be sampled, ideally three from each access point.

A single sample will be collected from each dredge at the point the discharge leaves the sluice box. For dredge operations where the plume is being sampled (see below) three effluent samples will be collected.

The effluent samples will be collected by filling a one-liter sample bottle in quarter-volume increments over a five-minute period, in an effort to obtain a representative time-dependent composite. The sample will be allowed to settle for 45 minutes and then ½ liter decanted into sample containers. This will remove sand and other large particles that would normally settle out of the water column. A settling time of 45 minutes was selected based on the settleable solids analysis in EPA Method 160.5.

The effluent samples will be analyzed for total recoverable arsenic, copper, lead, and zinc. By statute, a total recoverable analysis is required for metals point sources to account for the total amount being discharged to a waterbody.

Effluent flow rates will be estimated from the water velocity and dimensions of the sluice box, and pump specifications. These results, along with measurements of stream depth and velocity, channel width, river flow, and ambient metals partitioning, will be used in a point source dilution model to estimate water quality impacts under various dredging scenarios.

Dredge Plumes

The plumes from three dredges operating in under varying river flows--one each in July, August, and September--will be sampled to gauge the downstream extent of the impacted area. Three samples each will be collected at 10, 50, and 200 ft. below the dredge, staggered over

approximately a one-hour period. The dredge effluent will be sampled at the same time. A single sample will also be collected immediately upstream of the dredge suction hose for comparison with the plume. A marked poly line with a float at the far end will be attached to the back of the dredge to locate the downstream sampling points.

The upstream and plume samples will be analyzed for total recoverable arsenic; dissolved copper, lead, and zinc; TSS; turbidity; and hardness. Arsenic is being analyzed as total recoverable for comparison to the human health standards, which are based on inorganic arsenic. Most of the arsenic in the Similkameen River water is in inorganic form (Johnson, 2002). Measuring inorganic arsenic directly would be more expensive. Total recoverable arsenic can reasonably be compared to the dissolved aquatic life criteria, since they are little different from the total recoverable criteria on which they are based. Copper, lead, and zinc are being analyzed as dissolved for comparison with the aquatic life standards.

Ambient River

Additional samples will be collected in the Similkameen River near Nighthawk to measure background concentrations for the metals and other parameters of interest. These samples will be collected in the early morning to ensure that no dredges are operating upstream.

Three samples will be collected for each field trip and analyzed for total recoverable and dissolved arsenic, copper, lead and zinc; and also for turbidity, hardness, and pH. In addition to setting background conditions, the data will be used to determine how these metals apportion between particulate and dissolved fractions, information needed in the point source model mentioned above.

Number of Samples

The number and type of samples to be collected for this project are summarized in Table 3.

Table 3. Summary of Samples to be Collected

Sample Type	No. of Sites	Samples per Site	Subtotal	Analyses
Dredge Effluent	15	1-3	21	TR As, Cu, Pb, Zn
Dredge Plume	3	10	30	TR As; Diss Cu, Pb, Zn; TSS; turb.; hard.
Ambient River	1	9	9	TR As; Diss Cu, Pb, Zn; TSS; turb.; hard.
" "	1	9	9	TR Cu, Pb, Zn
Filter Blanks	3	1	3	Diss As, Cu, Pb, Zn
		Total =	72	

TR = total recoverable
Diss = dissolved

Sampling Methods

Table 4 lists the sample size, container, preservation, and holding time for each study parameter. Sample containers will be obtained from Manchester Laboratory.

Table 4. Sample Containers, Preservation, and Holding Times for Water Samples

Parameter	Minimum Quantity Required	Container	Preservative*	Holding Time
Metals	250 mL	500 mL Teflon bottle	HNO_3 to pH<2, 4°C	6 months
Hardness	100 mL	125 mL poly bottle	H_2SO4 to pH<2, 4°C	6 months
TSS	1,000 mL	1,000 mL poly bottle	Cool to 4°C	7 days
Turbidity	100 mL	500 mL polyl bottle	Cool to 4°C	48 hours

*dissolved metals to be field filtered (0.45 micron)

Metals sampling procedures will follow the guidance in EPA Method 1669 *Sampling Ambient Water for Trace Metals at EPA Water Quality Levels*. All samples will be taken as simple grabs or grab composites.

Metals samples will be collected directly into pre-cleaned 500 mL (plume and ambient samples) or 1 L (effluent samples) Teflon bottles. The effluent samples will be allowed to settle and be decanted as previously described. Samples for dissolved metals will be filtered in the field through a pre-cleaned 0.45 um Nalgene filter unit (#450-0045, type S). The filtrate will be transferred to a new pre-cleaned 500 mL Teflon bottle. The whole water and filtered water samples will be preserved to pH <2 with sub-boiled 1:1 nitric acid, carried in small Teflon vials. Teflon sample bottles, Nalgene filters, and Teflon acid vials will be cleaned by Manchester, as described in Kammin et al. (1995), and sealed in plastic bags. Non-talc nitrile gloves will be worn by personnel filtering the samples. Filtering will be done in a glove box constructed of a PVC frame and polyethylene cover. pH will be measured with an Orion meter.

Field activities will be recorded in a bound notebook of waterproof paper. A hand-held GPS will be used to record sampling locations. All samples will be placed in polyethylene bags and held on ice for transport to Ecology Headquarters. All samples will be kept in a secure cooler and transported to Manchester Laboratory within one-to-two days of collection. Chain-of-custody procedures (Manchester Environmental Laboratory, 2003) will be followed.

Measurement Methods

Table 5 shows the number of samples, expected range of results, and analytical methods for this project. Metals will be analyzed by ICP/MS (EPA Method 200.8). Hardness will be analyzed by ICP (EPA Method 200.7), with Standard Methods 2340B algorithm used for the hardness calculation.

Table 5. Laboratory Procedures

Analyte	Sample Matrix	Number of Samples	Expected Range of Results	Sample Prep Method	Analytical Method
Arsenic	whole water	60*	0.2- 500 ug/L	HNO_3/HCl digest	EPA 200.8
Copper	whole water	27*	0.5 - 500 ug/L	HNO_3/HCl digest	EPA 200.8
Lead	whole water	27*	<0.02 - 500 ug/L	HNO_3/HCl digest	EPA 200.8
Zinc	whole water	27*	<0.3 - 500 ug/L	HNO_3/HCl digest	EPA 200.8
Copper	filtered water	38**	0.5 - 50 ug/L	analyze directly	EPA 200.8
Lead	filtered water	38**	<0.02 - 10 ug/L	analyze directly	EPA 200.8
Zinc	filtered water	38**	<0.3 - 100 ug/L	analyze directly	EPA 200.8
Hardness	whole water	36	75 - 125 mg/L	N/A	EPA 200.7
TSS	whole water	36	1 - 200 mg/L	N/A	EPA 160.2
Turbidity	whole water	36	1 - 100 NTU	N/A	EPA 180.1

*analyzed as total recoverable
**analyzed as dissolved

Quality Control

Field and laboratory QC samples to be analyzed for this project are shown in Table 6.

Table 6. QC Samples, Types, and Frequency (a batch is 20 unknowns)

	Field QC	Laboratory QC			
Parameter	Filter Blanks	Check Standards/ LCS	Method Blanks	Analytical Duplicates	Matrix Spikes
Metals	2	2/batch	1/batch	1/batch	2/batch
Hardness	N/A	1/batch	1/batch	1/batch	2/batch
TSS	N/A	1/batch	1/batch	1/batch	N/A
Turbidity	N/A	1/batch	1/batch	1/batch	N/A

Field Quality Control

One filter blank will be analyzed for each field trip to detect contamination arising from sample containers, the filtration procedure, preservative, or sample handling. The filter blanks will be prepared using the deionized water-filled Teflon bottles that Manchester provides for metals samples. For preparing the blanks, a bottle will be opened and filtered in the field, using the same procedure as for the river water samples. The filtrate will be transferred to a new bottle, after rinsing with a small amount of same filtrate, and acidified.

Field blanks will be prepared for metals only.

Analytical Quality Control

Laboratory QC samples will include check standards/laboratory control samples, method blanks, analytical duplicates, matrix spikes, and matrix spike duplicates, as indicated in Table 6.

Three metals samples will be analyzed in duplicate to provide estimates of analytical variability. The samples will be selected in the field as representing anticipated high, medium, and low metals concentrations. Samples for duplicate analysis will be identified on the sample tags and the chain-of-custody form. Duplicates for the conventional analyses will be selected by Manchester, following their standard practice.

The laboratory control samples (LCS) for the metals analysis will include SLRS-4 (Riverine Water Reference Material for Trace Metals, National Research Council Canada) or equivalent. SLRS-4 is certified for the low metals concentrations typical of ambient rivers and streams. Manchester will also prepare a spiked blank for the metals analysis. It will be spiked at 10-15 ppb. Manchester's data report will include the metals concentrations measured in the LCS samples and their names, sources, and certified values, in addition to the percent recovery data normally reported.

Manchester's analysis of SLRS-4 indicates it may be biased high for arsenic (Dean Momohara, Manchester Laboratory, Personal Communication). If the same discrepancy is observed for this project, Manchester's need not qualify the arsenic data.

Data Verification and Validation

The field notes will be verified by reviewing this information prior to leaving each sampling site.

Manchester will verify the laboratory data by examining their results for errors or omissions and examination of the QC results for compliance with acceptance criteria. Reviewers use EPA 540/R-94-013, U.S. *EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, February 1994*. Their findings will be documented in a case narrative.

The data package will be validated by the project lead who will use professional judgment to determine whether the procedures in the methods, SOPs, and Quality Assurance (QA) Project Plan were followed. Once the data have been verified and validated, the project lead will examine the data to determine if the MQOs have been met.

Data Analysis

The field and laboratory data will be entered into Excel spreadsheets. Hardness results will be used to calculate the water quality criteria corresponding to each sample, using the Ecology spreadsheet tsdcal11.xls (http://www.ecy.wa.gov/programs/eap/pwspread/pwspread.html), and exceedances identified.

The dredge plumes will be characterized with respect to downstream extent and exceedances of standards. A point source model (pwsspread.xls http://www.ecy.wa.gov/programs/eap/pwspread/pwspread.html) will be used to characterize dilution. EPA's SMPTOX3 program (http://epa.gov/ceampubl/swater/smptox3/index.htm) will be used to simulate the effects of different numbers and locations of dredges on metals concentrations in the river.

On, or before, March 2004, the project lead will prepare a draft report of findings. The report will include:

- maps of the study area showing sampling sites
- descriptions of field and laboratory methods
- a list of the dates, locations, and sizes of the dredges sampled
- discussion of data quality and the significance of any problems encountered in the analyses
- summary tables of the field and laboratory data
- results from the data analysis
- conclusions and recommendations with respect to the potential for small-scale gold dredging to exceed state water quality standards within the Similkameen River

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PUBLISHED BY THE WASHINGTON ALLIANCE OF MINERS AND PROSPECTORS
with additions by Steve Herschbach of Alaska Mining & Diving Supply

I. INTRODUCTION

Listed below is a number of quotes from studies that have been done over the years, please keep in mind that some were done on large 50 + cubic yard per hour placer mining operations, others were done on a variety of suction dredges, and some were done in a laboratory environment. All were done by well respected and educated people only a few of which have had any practical experience with placer mining/prospecting. The quotes listed in this document were taken word for word out of the documents written by the scholars named above each quote.

A. By: Paul J. Badali - 1988

"Several federal and state laws charge various governmental agencies to provide for the protection of these habitats. Our nation's technology based society has an ever increasing need for mineral resources, gold included. An ever growing number of people enjoy Recreational Gold Dredging as a hobby. Suction dredge operators working valid federal mining claims have a constitutional right under the 1872 mining laws to recover the valuable minerals present in the substrate. Private property owners and holders of state minerals leases also have rights to recover gold and other minerals present in streams and rivers. How can the country's need for natural resources, the individual's right or desire to mine, and need to protect the environment all be realized and satisfied?"

II. ENTRAINMENT

A. By: Phillip A. North - 1993

"While adult fish did not show a sensitivity to entrainment it is unlikely that they would be sucked into a dredge in the first place. They have the ability to avoid entrainment in a suction dredge by moving to a safer location. All of the investigators who examined the impacts of suction dredges on adult fish concluded that this life stage was not acutely affected (Harvey 1986, Hassler et al. 1986, Summer and Hassler 1992). Harvey (1986) found this to be the case for rainbow trout on streams he studied in California."

III. FEED AND FISH

A. By Dr. Henry Baldwin Ward

"most significant is a possible relation of fine silt to the food of young fish. It has been shown that the presence of finely divided suspensoids of natural origin may be of advantage to the microbiota which constitutes the foundation element in the food supply of water. Studies on aquatic biology conducted by the Wisconsin Survey demonstrated that colloidal organic particles collect on carbon and sand grains to build a culture medium for aquatic bacteria".

B. By: Thomas J. Hassler, William L. Somer, Gary R. Stern - 1986

"During diving surveys, we observed Salmon gairdneri congregating and selectively feeding on benthic invertebrates displaced by dredging."

"Suction dredge mining at levels observed in Canyon Creek probably did not impact steelhead feeding. The mining did not significantly reduce the abundance of aquatic invertebrates (only species composition locally) and steelhead fed opportunistically. In fact , juvenile steelhead were observed feeding on invertebrates that had been entrained in and dislodged by dredge. Thomas (1985) observed cutthroat trout feeding on dislodged invertebrates in the dredge outfall. "However, weight of juvenile steelhead from Canyon Creek was greater than weight from other areas and production (kg/ha) was as good or better than in other areas (table 41)." "Ecological differences between Canyon Creek and BEF were also important in determining colonization of samplers. Overall, the impacts of suction dredge mining to benthic invertebrates at the study site were minimal."

C. From: Robert Lewis, Pollution Bioanalyst III - 1962

"Benthos survival is noted in Table 2. Insects with internal extrusions were listed as mortalities. The morality figure of 7.4 percent may be extreme because of confinement in the sack. Many caddis larvae were still attached to rocks after passing through the dredge. All insects except those with extrusions appeared lively and unharmed."

"To determine stream distance necessary for insects to settle back to the bottom, a net was placed 15 feet and 25 feet downstream from the outflow. After five minutes at the former distance, Trichoptera, Coleoptera and Diptera were prevalent in the net. Only one Plecoptera was noted. At 25 feet downstream only few insects were caught in the net after five minutes. Underwater inspection with a faceplate indicated that all insects settled within 40 feet. The approximate flow throughout this distance varied from 1 ft./sec. down to 0.5 ft./sec."

D. By: Phillip A. North - 1993

"If recolonization is slow the cumulative impacts of suction dredge mining could be significant over a period of seasons. However, in all of the studies on suction dredges that investigated this question the disturbed stream reach was relatively short (on the order of a few tens of meters) and recolonization proved to be rapid. Griffith and Andrews (1981) found that the dredged site was "substantially recolonized" after 38 days. The abundance within orders of invertebrates were the same before and after dredging and "key" taxa were also the same. Harvey (1986) found that recolonization was complete in terms of numbers of insects within 45 days of dredging. Thomas (1985) sampled the site 30 days after dredging and found, again, that colonization was "substantially complete" for most groups. The number of invertebrates colonizing the artificial substrates used by Somer and Hassler (1992) did not increase after the first sampling at two weeks. None of these investigators sampled their study site earlier than the reported time of recolonization. Recolonization may have occurred sooner than the time reported."

E. By: The U.S. Environmental Protection Agency - 2001

"The results from Resurrection Creek indicated that there was no difference in the macroinvertebrate community between the mining area and the locations downstream of the mining area in terms of macroinvertebrate density and taxa richness. The sampling was done 35 days after mining had been completed for the season and shows a rapid recovery of the mined areas."

IV. FLUSHING FLOWS

A. By: Gary R. Stern - 1988

"The autumn, winter and spring peak flows of WY 1985 Canyon Creek were adequate to disperse dredge tailing piles and fill in dredge holes. Less than 9% of the holes and tailings from 1984 mining were visible at the start of the 1985 dredge season. Only two sites from 1984 had clear remnants of holes and tailings in 1985. Both of these were far from the stream's thalweg. At a few sites large cobbles and boulders piled along the shore remained visible one year later. Thomas (1985) reported that piles of cobbles remained along the shore one year later at Gold Creek, Montana, but holes and instream tailings had vanished. Harvey et al. (1982) found virtually no evidence of dredge mining the following year in the American River, California. Most streams with mobile beds and good annual flushing flows should be able to remove the instream pocket and pile creations of small suction dredges, although regulated streams with controlled flows may not."

V. SEDIMENT

A. By: Dr. Henry Baldwin Ward

"All of these tests show .That the amount of colloidal material in the water of the Rouge River and its tributaries below the point at which the run-off of placer mine workings has been added to the stream is to small to produce on the bottom a "blanket" which might affect adversely young fish eggs in the nests if present, or the fish food in the water." "Even below the points at which tributaries entered from areas in which placer mining had gone on at earlier months in the year, no change from normal conditions were observed. The pools sheltered migrating fish; they were also seen in the stream below the dams, and a normal supply of fish food was found at various points visited."

These studies were done on commercial placer mining!

"The supplementary report of Mr. A. M. Swartley, who aided me in the part of the survey made in September, 1937, is of value in giving the views of a careful and experienced geologist. He confirmed fully statements I had reached in my preliminary report as to the physical conditions found in the Rogue River drainage, and especially the small amount of clay and other material on shores and stream bottoms, in backwaters and otherwise in our examination of the river and its tributaries. He discussed fully the methods of rock disintegration and the transportation and ultimate character of the materials produced. He emphasized the fact that mining debris "is chemically inert, makes no oxygen demand on the stream and therefore takes away from the flowing water nothing which the fish require. This is equally true of this material whether placed in transit by nature or by man since (the products) are alike in nature, come from the same sources and are only being accelerated by man in their journey to the sea." Further he stated:" All these materials entering the streams, whether by natural or human activity, whether coarse or fine, whether traveling on the bottom, in suspension or solution ,are almost altogether inert, suffer little change on their way to the sea, and having reached the end point of chemical change do not rob the water of oxygen which the fish demand, or add to the water toxic agents injurious to fish (fish food or other forms of life)."

VI. EFFECTS OF SILT ON FISH

A. By: Dr. Henry Baldwin Ward

"I have seen among these Alaska rivers in which salmon run and spawn some so heavily loaded with mud that one could not trace the body of an adult salmon ascending the river even when the dorsal fin cut the surface of the water. Yet the fish examined on the spawning grounds just before and just after death showed that the gills had suffered no injuries on the way though the body had met with conspicuous external damage through violent contact with sharp rocks at rapids or falls or along the shore. The examination was made in connection with the study on the cause of death after spawning and all organs were closely inspected. The gills were reported as apparently in perfect condition. Although the object of the investigation was not to determine the effect on the gills of silt loaded waters, still, if any evident injury had been present, it would have been noted. The journey up the Copper and its tributary was long and strenuous; the chance for damage to the salmon from muddy water was certainly large if any damage could be wrought by such conditions, and yet none was observed. Many other similar cases could be cited from printed as well as published records."

"Despite their far greater sensitiveness to changes in environment and susceptibility to injury, the young salmon lived heartily in a concentration of sediment which was at its minimum (760 ppm) twice as much as the maximum recorded at Agness (see Table II). Indeed the average amount of turbidity in Griffin's experiments was ten times the average recorded at Agness. Those who think that normal erosion products will prove injurious to such fish should examine carefully the records in these tables."

VII. EFFECT ON SPAWNING GROUNDS

A. By: Dr. Henry Baldwin Ward

"Normally the fish cover the eggs by a layer of sand or fine gravel; the fresh water carrying oxygen easily penetrates this cover and the young wriggle out after the eggs hatch. A thin, broken layer such as I have already described would not interfere with the permeation of fresh water with oxygen and the development of such eggs as might be present. But I am clear that this is not a true spawning area. As Mr. Joseph Wharton said in an admirable paper on the salmon of the Rogue River, "It is the ambition of all these species of anadromous fish to ascend the river to the highest point attainable before making their spawning beds, seeking the waters that are purest and coldest." This statement is absolutely correct; In difficult streams or when held behind man-made barriers, these fish struggle to the end to make their way upstream and will sacrifice life rather than accept spawning

areas in the lower reaches of the river. The urge which drives them on is the basis for the safety of the race. For the straggler or the weakling who may find the achievement of headwaters impossible, an enforced spawning in the lower river is of no significance; the river level varies too widely and its current at full flood is too fierce. Eggs deposited at high water will be exposed and die when the water falls; or if the spawning occurs at a lower water level, the next flood waters will bury the eggs or sweep them away. The suddenness, the violence and the irregularity of the changes in water level of the Rogue are conspicuous in the records of every year."

B. By: Thomas J. Hassler, William L. Somer, Gary R. Stern

"Dredge tailings are often referred to as good salmonid spawning substrate. In the Trinity River, chinook salmon have been observed spawning in the tailing piles of suction dredges (E. Miller pers. comm.). Steelhead in Idaho streams have been reported to spawn in gravels recently disturbed by human activities (Orcutt et al. 1968). In the American River , Prokopovich and Nitzberg (1982) have shown salmon spawning gravels have mostly originated from old placer mining operations."

"Anadramous salmonids held and spawned in Canyon Creek in close proximity to suction dredge activity. During the 1984-1985 spawning season, fall-run chinook salmon, coho salmon and steelhead spawned in areas actively dredged during the 1984 dredge season (fig.). In August 1985, spring-run chinook salmon and summer-run steelhead were holding near areas where suction dredges were being operated (fig. 23). During the 1985 spawning season, fall and spring-run chinook salmon spawned in areas actively dredged during the 1985 dredge season (fig. 24)."

C. By: Gary R. Stern - 1988

"Suction dredge mining did not appear to influence the locations of adult anadramous salmonid summer-holding areas. One spring-run chinook salmon was observed 50 m below an operating dredge and a summer-run steelhead was seen at the upper end of a 30 m-long pool while a dredge was operating at the lower end. Seven other adult salmonids were observed within 250 m of an active dredge operation and none appeared to be disturbed by mining activities. During a 1980 diving survey by Freese (1980), an adult spring-run chinook salmon was observed holding at the bottom of an abandoned dredge hole in Canyon Creek and other adult salmonids were found in close proximity to active dredges. No relation between holding areas of

spring/summer-run fish and suction dredge mining operations was apparent during this study or in 1980 (L. Freese pers. comm.)."

VIII. CHANGES IN THE STREAM BED

A. By : Dr. Henry Baldwin Ward

"To be sure no one can think rightly of the stream itself as a constant environment. On the contrary it is undergoing continual change. The amount and location of winter's snowfall, the volume and time of seasonal rains, the duration and precise period of regional droughts, and other climatic variations produce variations in water level, in bank erosion, in growth of grasses, underbrush and trees in the drainage basin; thus sudden and often extreme changes in contours of the banks and surrounding country add sediments of different types to its waters and modify the conditions under which the fish it harbors are forced to live." Number one on the list of things that change the shape of the stream bed are DAMS!"

B. By: Thomas J. Hassler, William L. Somer, Gary R. Stern - 1986

"However during the suction dredge mining process, a new pool area is created by the cone shaped dredge hole. Dace, suckers and juvenile steelhead were observed feeding and resting in Canyon Creek dredge holes. Freese (1980) observed a small spring-run chinook salmon holding in a dredge-created pool on Canyon Creek".

"The majority of suction dredge operators in canyon creek did not work long periods or disturb large areas of the streamed. Dredging impacts upon the channel geomorphology were confined to the area dredged and the area immediately down stream."

"Winter and spring flushing flows filled in dredge holes and dispersed tailing piles." "Coho salmon and steelhead juveniles appeared to rear normally in the creek and were observed using dredge holes in the summer. Steelhead juveniles received the greatest exposure to dredging activity as they rear in Canyon Creek up to three years, but their feeding, growth and production did not seem to be impacted at the current level of dredge activity."

C. By: Somer and Hassler - 1992

"The effects of the two dredges on aquatic insects varied with taxa and were site specific. Dredging dislodged insects, and we observed young coho salmon and steelhead feeding on them. The stream underwent major but localized changes. Dredge hole were excavated to a depth of 2 m, and substrate was altered to bedrock and large cobbles-probably

a poor habitat for colonization. However, the effects of dredging (at the operating level during the study) on insects and habitat were minor compared with those of bed-load movement due to large stream flows during storms and from snowmelt."

D. By: Gary R. Stern - 1988

"Lewis (1962) was the first to investigate the effects of the portable suction gold dredge on the aquatic habitat of fish and benthic invertebrates. He operated a 12.7 cm aperture dredge in Clear Creek, Shasta County, California and found that dredging could improve the intergravel environment for both fish eggs and benthos if the stream was mined in a uniform manner."

"If dredge mining regulations were expounded upon and miners were made aware of the instream habitat needs of salmonids, the most serious impacts of suction dredge mining could be reduced. Suction dredgers may even be able to enhance certain areas of the channel for rearing and spawning fish, if some of the limiting factors of a reach of stream are identified (ie. cover, woody debris, low velocity refuges, clean gravels). In Canyon Creek, current CDFG suction dredge regulations eliminate conflicts with salmonid spawning, incubation, and fry emergence by restricting mining to summer months. The 15.24 cm maximum aperture size for dredges is appropriate since stream substrate is large, but larger apertures may be too disruptive in the small channel."

E. By: Robert Lewis, Pollution Bioanalyst III

Results of Gold Suction Dredge Investigation;

"Table 1 lists stand pipe results. The site average indicates an improvement from dredging of 1 p.p.m. in DO and a threefold improvement in permeability and velocity. As indicated above, dredged sand settled within 12 feet of the sluice outflow. This occurrence tends to somewhat nullify removal of sediment, but dredged areas are definitely relieved of compaction. As a gross measure, the standpipe was much easier to drive in the dredged area. As evidenced by photographs the gravel appears much cleaner after dredging. Weighing all factors, dredging can improve the gravel environment for both fish eggs and aquatic insects, especially if the operator mined uniformly in one direction as opposed to a pocket and pile method."

F. By: Phillip A. North - 1993

"The four studies that I reviewed from journals subject to peer review consistently found that when certain limitations are placed on suction dredge activity the impacts on the stream ecosystem are local and of short duration."

G. By: Bret C. Harvey - 1986

"Fish and invertebrates displayed considerable adaptability to dredging, probably because the streams naturally have substantial seasonal and annual fluctuations (Moyle et al. 1982). These fluctuations, in the form of flushing winter flows, can greatly reduce the long term impact of dredging. Even during the relatively mild winter of 1980/81, high flows still filled the hole created by dredging on NFAR with a sand and gravel mixture and eliminated all sand from the main streamed. After the high flows in winter and spring of 1981/82, no substrate changes caused by dredging in the previous summer were evident on Butte Creek. Saunders and Smith (1965) observed a quick recovery in the trout population after scouring of a heavily silted stream, which, along with the quick temporal recovery of stream insects seen in this study, implies that suction dredging effects could be short-lived on streams where high seasonal flows occur."

IX. TEMPERATURE

A. By:Thomas J. Hassler, William L. Somer, Gary R. Stern - 1986

"and dredge mining had little, if any, impact on water temperature."

X. TURBIDITY

A. By: Dr. L. E. Giiffin

"When the test ended on Dec. 30, it was found that a much larger proportion of the fish in the sediment -containing trough had survived (56%) than in the clear water trough (10%). There was no noticeable difference in the color of the surviving fish in the two troughs, and the fish which had lived in the muddy water were as large as the survivors from the clear-water trough."

"The results of the experiments indicate that young trout and salmon are not directly injured by living for considerable periods of time in water which carries so much soil sediment that it is made extremely muddy and opaque. They also indicate that cutthroat trout and salmon fingerlings can feed and grow apparently well in very muddy water."

B. By: Dr. Henry Baldwin Ward

"In contrast with all these the experiments of Dr. Griffin have shown that young fish live well up to 30 days in good water mixed with an amount of natural soil materials from two to three times as large as the extreme load of the materials contributed to the Rogue River by maximum conditions produced by placer mining."

"All the evidence that has been obtained justifies the conclusion that no present-day contributions of materials produced by bank erosion differ in character or exceed in amount those added periodically by purely natural processes in past times. Splendid runs of salmon and steelhead were established and maintained under truly natural conditions which certainly were on occasion more extreme and violent before man ever came into the picture than they are today. Furthermore, there is good reason to believe that placer mining run-off was larger in amount and more continuous in the early years of that industry when for a time at least greater areas were followed than are employed today."

This study was done to study the effects of large scale placer mining operations!

XI. WATER QUALITY

A. By: Thomas J. Hassler, William L. Somer, Gary R. Stern

Water quality was impacted only during the actual operation of a suction dredge. Since a full day of mining by most Canyon Creek operators included only 2 to 4 hours of dredge running time, water quality was impacted for a short time.

B. By: Gary R. Stern - 1988

"Turbidity plumes below suction dredges are often markedly visible due to extremely low ambient turbidity levels in mountain streams. The extent of the plume depends on the grain size and volume of the material passing through the dredge. Horizons of silt-laden substrate were disturbed at all dredge sites in Canyon Creek and created highly visible turbidity plumes. "

"Although distinct to even the most casual observer, dredge plumes in Canyon Creek were probably of little direct consequence to fish and invertebrates. Suspended sediment concentrations of 20,000 to 100,000 mg/l which impact fish feeding and respiration (Cordone and Kelly 1961) greatly exceed the highest level of 274 mg/l measured in Canyon Creek. In general, dredge turbidity plumes were highly localized and occurred during midday which is not a peak feeding

period for steelhead (Moyle 1976). Laboratory studies by Sigler et al. (1984) found that steelhead and coho salmon preferred to stay in channels with clear water, and turbidities as little as 25 NTU's caused a reduction in fish growth. In contrast to Sigler's results, young steelhead in Canyon Creek appeared to seek out dredge turbidity plumes to feed upon dislodged invertebrates even though clear flowing water was available nearby."

C. By: Phillip A. North - 1993

"Most water quality studies of the effects of suction gold dredges on streams have focused on turbidity and suspended sediments. These studies have, with some exceptions, largely found that water quality is impacted for a distance downstream of the dredge ranging from a few meters to 30 meters."

"However, Huber and Blanchet (1992) found no evidence of cumulative impacts of mining on water quality in streams of the Chugach National Forest in Alaska. They monitored streams in the Forest over a period of three years and found no noticeable impact to water quality associated with suction dredges. All of the studies that I surveyed came to the same conclusion: suction gold dredging had localized and short term impacts. Caveats must be taken into account when coming to this conclusion:

All of these studies, except one involved small dredges, 6 inches or less. The one study that involved a larger dredge reported only a small amount of data. Five water samples were taken 500 feet below a six inch dredge and one sample was taken 500 feet below an 11 inch dredge."

D. By: The U.S. Environmental Protection Agency - 2001

"In the 1997 permit, EPA defined a small suction dredge as those with nozzles less than or equal to four inches. EPA is proposing to redefine the small suction dredge range as less than or equal to six inches. Information provided in EPA's suction dredge study and the United States Geological Survey (USGS) study support the conclusion that there are local but short term effects on both water quality and macroinvertebrate communities in the mining areas. On the Fortymile River, dredges larger than those proposed under this GP showed that turbidity was reduced to background levels within 250 feet. It is expected that small dredges would have even less impact on the downstream receiving water quality."

XII. REFERENCES

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The quotes listed in this document were taken word for word out of the documents written by the scholars named above each quote.

This information was compiled with the intent to inform and educate, so the true facts can be a part of the process in the rule/regulation making pertaining to small scale placer mineral/metal mining and prospecting in our rivers and streams.

With special thanks to the Washington Alliance of Miners and Prospectors and Jerry Hobbs.

Frank Ames - Spring 1995

Note on DR. HENRY BALDWIN WARD

Dr. Henry Baldwin Ward was born into a family of highly regarded scientists. His father, Richard Halsted Ward, was a noted Microscopist who made many advances and inventions in his field. His Aunt, Anna Lydia Ward, in 1886, traveled farther North than, up to that date, any other American woman. Her study of the Eskimos in Northern Labrador formed the basis of an illustrated lecture tour that she gave throughout the country. She was also the author of a number of books on poetry and prose. With this kind of background it is no wonder that Henry himself became a scientist of great renown. Today, the highest award given in the field of parasitology is the "Henry Baldwin Ward" medal. Henry may also be thought of as one of America's first conservationists.

The following biography is a reprint from "The Dictionary of American Biography," Supplement Three, 1941-1945; pages 802-803; Charles Scribner's Sons, Inc. New York, 1973; Edward T. Jones, Editor.

WARD, HENRY BALDWIN (Mar. 4, 1865-Nov. 30, 1945), zoologist and parasitologist, was born in Troy, N. Y., one of four children and the older of the two sons of Richard Halsted Ward, physician and microscopist, and Charlotte Allen (Baldwin) Ward. Both parents were natives of Bloomfield, N. J. Henry B. Ward attended the public schools of Troy and Williams College (his father's alma mater), from which he graduated, A. B., in 1885. After three years of teaching science in the Troy high school, he went to Europe in 1888 for graduate study in zoology, and for two years attended the universities of Göttengen, Freiburg, and Leipzig, spending the vacation periods at the marine laboratories of Naples, Ville-Franche-sur-Mer, and Helgoland. He was particularly influenced by Prof. Rudolgh Leuckart of Leipzig, an authority on the invertebrates and founder of the celebrated laboratory of parasitology. At Leipzig, Ward conceived the ambition to found a similar laboratory in the United States. Upon his return in 1890, he entered the graduate school of Harvard University, where he received the Ph. D. degree in 1892, with a dissertation on the marine nematomorph Nectomnema agile, Verrill, a species he had observed at Naples.

Ward was appointed instructor in zoology at the University of Michigan in 1892 but moved after a year to the University of Nebraska, at first

as associate professor, from 1896 as professor. While at Nebraska he published a series of papers on the parasites of man and discovered the presence in the United States of the human lung fluke, Paragonimus. He played a major role in developing a two-year premedical course and in 1902 became the first dean of the University of Nebraska College of Medicine, newly established at Lincoln in affiliation with the Omaha Medical College. In 1909, however, plans were made to move the Lincoln unit to the Omaha campus. When it became clear that, because of rivalries between the two medical faculties, Ward would not be retained as dean after the move, he resigned.

That fall he went to the University of Illinois as head of the department of zoology, a position he was to occupy with distinction until his retirement in 1933. In addition to teaching zoology at the undergraduate level, he established one of the first research laboratories in the United States to offer graduate work in parasitology. The large number of students who received the Ph. D. under his supervision later made significant contributions to the growth of this science. To provide an outlet for publishing the results of such research, he inaugurated in 1914, with the assistance of his colleagues Stephen A. Forbes and William Trelease, the series of Illinois Biological Monographs. That same year he also founded the Journal of Parasitology, the first American publication devoted to the field; he continued to edit the journal until 1932, when he presented it to the American Society of Parasitologists to become its official organ.

Ward's research reflected in part his love of the outdoors. He early began biological research on the Great Lakes, at first for the Michigan Fish Commission. For many years, beginning in 1906, he conducted summer field investigations of the Alaska and Pacific salmon. Besides his papers on parasites, which dealt with such subjects as parasites of the human eye, the relations of animal parasites to disease, and the spread of fish tapeworm, he was the co-author, with George Chandler Whipple, of Fresh-Water Biology (1918), long a standard work. An active member of the Izaak Walton League of America, of which he was president, 1928-30, and of the National Wild Life Federation, Ward was deeply concerned with national problems of wildlife conservation and the pollution of streams.

Ward belonged to a large number of scientific societies and was a leader of many, including the American Microscopical Society (president, 1905), the American Society of Zoologists (president 1912-1914), and the American Society of Parasitologists, of which he was the first president when it was founded in 1925. He contributed

significantly to the development of the American Association for the Advancement of Science, as the secretary of Section F (zoology) in 1900, general secretary (1902), vice-president (1905), and permanent secretary (1933-37); and the scientific honor society, Sigma Xi, as secretary (1904-1921) and president (1922-23). Ward was influential also in university affairs. At Illinois he worked closely with President Edmund J. James; articulate and well-spoken, he was particularly effective on faculty committees. He received honorary doctorates from the universities of Cincinnati (1920), Oregon (1932), and Nebraska (1945) and from Williams College (1921).

Ward was a handsome, vigorous man, somewhat above average height. Aristocratic, autocratic, ambitious, and enthusiastic, he demanded excellence of himself and of others. On Sept. 11, 1894, he married Harriet Cecilia Blair of Chicago, who was teaching at the music school of the University of Nebraska. They had two daughters, Cecilia Blair and Charlotte Baldwin. Ward was a member of the Presbyterian Church. He died in Urbana, Ill., of a heart attack in his eighty-first year, and was buried there in Mount Hope Cemetery. Sometimes called the "Father of American Parasitology," he was to America what Leuckart had been to Germany.

From: "Ron Kliewer" <kliewer1@verizon.net>
To: <dfgsuctiondredge@dfg.ca.gov>, "Ron Kliewer" <kliewer1@verizon.net>
Date: 12/3/2009 9:12 PM
Subject: dredging studies/comments for dredge study scoping period

Comments for consideration in the Suction Dredging SEIR:

By Ron Kliewer, U.S. Taxpayer, 35 year prospector, dredger, contributing author for ICMJ Mining Journal.

Dear Mr. Stopher,

I appreciate the fact you held 3 public hearings on this matter instead of only the required one meeting and took the time to talk to me individually in Fresno. It was beneficial in the fact I learned you did not know some basic things about mining (like what miner's moss is) and I didn't know other basic things like how environmentalists define terms (like invertebrates are fish, too). Open communication is helpful for all concerned.

As you may recall, I showed you some lead and mercury coated gold I had recovered with my dredge from the Salmon River several years ago. We discussed the pros and cons of what benefits dredging may have on the removal of mercury from the active waterways. You stated that a study had been done showing that dredging does remove 98% of the mercury that is dredged up, but that the 2% that is lost back into the river is floured so as to render it more dangerous to the environment than if all of it was left on the bottom of the river. I did some research and found the report to which I believe you were referring to. The report also declared the quantity of the mercury that was not captured by the dredge as being above the level that would be considered hazardous waste. The sampling and subsequent report was done by Rick Humphreys (Division of Water Quality, CA Water Boards) and some others in July, 2003. After reviewing the Staff Report prepared by Mr. Humphreys, here are my conclusions and suggestions:

First of all, the test was done on a mercury "hotspot" which is non- typical of the majority of the many miles of streams and rivers. Most reaches of the waterways don't have nearly as high of mercury levels as the location in the North Fork of the American River downstream from the historic Sutter's mill that was tested.

Second, the 4 inch Keene dredge used in the test did not employ the use of miner's moss in the recovery system. It only had a layer of carpet under the metal riffles in the sluice box. This set up will not collect the ultra fine values of gold and mercury present in the streambed sediments.

Here is what I am proposing:

Do more dredge tests to study mercury recovery levels utilizing miner's moss in the recovery system, testing not only in a mercury hot spot, but in an average reach of a river. In the study, also experiment with various recovery systems to see if 100% or very near 100% mercury recovery is achievable i.e. flared sluice box, over-under sluice, etc. Some claim 100% recovery has already been achieved with miner's moss in the sluice.

I remember you stating that no river testing of dredging would be done for this SEIR due to the SB-670 law that the Governor signed into law. However, the regulations that may be promulgated from the findings of this process and ultimately the final SEIR, will most definitely be utilizing incomplete data if this additional field study is not performed. I think a variance should be obtained to allow one or two dredges to be put in the water for research purposes. I suppose it could be done in Oregon or Washington that have not outlawed dredging, but would be better right here in CA, on the same mercury hotspot and several other sample locations. I am willing to volunteer my time and dredge equipment for this study. We should be able to come up with the sediment samples for laboratory testing in a day or two of dredging at each location.

I don't think the SEIR will be complete without performing this very critical step in evaluating and coming to a logical, educated decision. This makes a lot more sense than just talking about past tests, studies, experiences, etc., then speculating on what rules to apply to suction dredging. Think what could be accomplished in environmental cleanup if improved recovery systems were mandatory in all dredges (like spark arrestors on engines are now, etc). Imagine how much mercury, lead and other metals that could be cleaned out of the state's waterways at little or no cost to the state if dredgers are allowed to keep exercising their right to mine in California.

This video shows what has been happening in WA state in regards to miners recovering mercury from the rivers:
http://www.goldrushu.com/Washington-Miners-Awarded-for-Removing-Mercury.html

-Ron Kliewer, December 2, 2009

----- Original Message -----
From: Ron Kliewer
To: dfgsuctiondredge@dfg.ca.gov
Sent: Saturday, November 28, 2009 10:41 PM
Subject: Mark Stopher/ dredging studies

Hello Mark,
Thank you for taking the time to meet with the public on this importtant issue. I, as you, drove well over 300 miles the other day to the meeting

in Fresno. Please find attached the studies I told you about that related to dredging in other western states. I hope the information is helpful for you in your research. I will have some more to send you before the deadline on Dec.3.

Ron Kliewer
www.goldrushu.com

From: "Ron Kliewer" <kliewer1@verizon.net>
To: <dfgsuctiondredge@dfg.ca.gov>
Date: 12/2/2009 7:15 PM
Subject: Suction Dredging Comments for SEIR Scoping
Attachments: Comments for consideration in the Suction Dredging SEIR.docx

Attention Mark Stopher:
Please see attachment for comments. Thanks.
-Ron Kliewer

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-Ron Kliewer, December 2, 2009

From: "Ron Kliewer" <kliewer1@verizon.net>
To: <dfgsuctiondredge@dfg.ca.gov>
Date: 11/28/2009 10:41 PM
Subject: Mark Stopher/ dredging studies
Attachments: JOHNSON, 2004, Effects of Small-Scale Gold Dredging on Metals Concentration sin the Similkameen Ri.pdf; WASHINGTON ALLIANCE OF MINERS AND PROSPECTORS,, Excerpts From Suction DredgeStudies.pdf

Hello Mark,
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Ron Kliewer
www.goldrushu.com

From: "Roy J. Johnson" <royjjohn@pacbell.net>
To: <dfgsuctiondredge@dfg.ca.gov>
Date: 12/3/2009 11:48 AM
Subject: Dredge Info.
Attachments: Joseph-Greene-suction-gold-dredge-study.doc; 1986.htm

Hi
This is some very good info on Dredging and I'm assuming you have already looked at this info in depth. If you have not please spend some time with it if you will. Thank You
Roy J. Johnson

State Water Resources Control Board
Division of Water Quality
P.O. Box 100
Sacramento, California 95812-0100
Fax: 916-341-5620
email: commentletters@waterboards.ca.gov

June 6, 2007

Subject: **SUCTION DREDGE MINING**

Dear Board Members,

Thank you for allowing me this opportunity to comment on the water quality aspects of small-scale suction dredge mining.

As I have searched the scientific literature for studies on the effects of small-scale suction dredge mining on the environment I have learned that the preponderance of the published research studies have been directed towards assessment of its effect on the biology of the streams and rivers. In nearly every instance the results have concluded that the effects were less than significant.

In water quality terms some studies have discussed turbidity, water temperature, and suspension of heavy metals into the overlying water. I will focus my water quality comments on these three areas. But first I would like to put this issue in to perspective.

GEOGRAPHICAL SCALE OF SMALL-SCALE SUCTION DREDGING

It has been observed that environmentalists opposing suction dredging use data gleaned from reports that studied effects of environmental perturbations that are occurring on a system-wide basis. For example, they would characterize the affects of turbidity from a suction dredge as if it would impact downstream organisms in a manner that system-wide high water flow events might. This approach is entirely inconsistent with the way in which suction dredges operate or generally impact their downstream environment.

The California Department of Fish and Game (1997) described typical dredging activities as follows' "An individual suction dredge operation **affects a relatively small portion of a stream or river**. A recreational suction dredger (representing 90-percent of all dredgers) may spend a total of four to eight hours per day in the water dredging an area of 1 to 10 square meters. The average number of hours is 5.6 hours per day. The remaining time is spent working on equipment and processing dredged material. The area or length of river or streambed worked by a single suction dredger, as compared to total river length, is relatively small compared to the total available area."

In the Oregon Siskiyou National Forest Dredge Study, Chapter 4, Environmental Consequences, some perspective is given to small-scale mining. "The average claim size is 20 acres. The total acreage of all analyzed claims related to the total acres of watershed is about ***0.2 percent***. The average stream width reflected in the analysis is about 20 feet or

less and the average mining claim is 1320 feet in length. The percentage of land area within riparian zones on the Siskiyou National Forest occupied by mining claims is estimated to be only ***0.1 percent***." The report goes on to say, "Over the past 10 years, approximately 200 suction dredge operators per season operate on the Siskiyou National Forest" (SNF, 2001).

A report from the U.S. Forest Service, Siskiyou National Forest (Cooley, 1995) answered the frequently asked question, "How much material is moved by annual mining suction dredge activities and how much does this figure compare with the natural movement of such materials by surface erosion and mass movement?" The answer was that suction dredges moved a total of 2,413 cubic yards for the season. Cooley (1995) used the most conservative values and estimated that the Siskiyou National Forest would move 331,000 cubic yards of material each year from natural causes. Compared to the 2413 (in-stream) cubic yards re-located by suction mining operations the **movement rate by suction dredge mining would equal *about 0.7% of natural rates***.

It has been suggested that a single operating suction dredge may not pose a problem but the operation of multiple dredges would produce a cumulative effect that could cause harm to aquatic organisms. However, "No additive effects were detected on the Yuba River from 40 active dredges on a 6.8 mile (11 km) stretch. The area most impacted was from the dredge to about 98 feet (30 meters) downstream, for most turbidity and settleable solids (Harvey, B.C., K. McCleneghan, J.D. Linn, and C.L. Langley, 1982). In another study, "Six small dredges (<6 inch dredge nozzle) on a 1.2 mile (2 km) stretch had no additive effect (Harvey, B.C., 1986). *Water quality was typically temporally and spatially restricted to the time and immediate vicinity of the dredge* (North, P.A., 1993).

A report on the water quality cumulative effects of placer mining on the Chugach National Forest, Alaska found that, "The results from water quality sampling do not indicate any strong cumulative effects from multiple placer mining operations within the sampled drainages." "Several suction dredges probably operated simultaneously on the same drainage, but did not affect water quality as evidenced by above and below water sample results. *In the recreational mining area of Resurrection Creek, five and six dredges would be operating and not produce any water quality changes* (Huber and Blanchet, 1992).

The California Department of Fish and Game stated in its Draft Environmental Impact Report that "Department regulations do not currently limit dredger densities but the activity itself is somewhat self-regulating. Suction dredge operators must space themselves apart from each other to avoid working in the turbidity plume of the next operator working upstream. *Suction Dredging requires relatively clear water to successfully harvest gold* " (CDFG, 1997).

ELEVATED TURBIDITY AND SUSPENDED

Suction dredging causes less than significant effects to water quality. The impacts include increased turbidity levels caused by re-suspended streambed sediment and pollution caused by spilling of gas and oil used to operate suction dredges (CDFG, 1997).

"Suction dredges, powered by internal combustion engines of various sizes, operate while floating on the surface of streams and rivers. As such, oil and gas may leak or spill onto the water's surface. ***There have not been any observed or reported cases of harm to plant or wildlife as a result of oil or gas spills associated with suction dredging"*** (CDFG, 1997).

The impact of turbidities on water quality caused by suction dredging can vary considerably depending on many factors. Factors which appear to influence the degree and impact of turbidity include the amount and type of fines (fine sediment) in the substrate, the size and number of suction dredges relative to stream flow and reach of stream, and background turbidities (CDFG, 1997).

Because of low ambient levels of turbidity on Butte Creek and the North Fork American River, California, Harvey (1986) easily observed increases of 4 to 5 NTU from suction dredging. Turbidity plumes created by suction dredging in Big East Fork Creek were visible in Canyon Creek 403 feet (123 meters) downstream from the dredges (Somer and Hassler, 1992).

In contrast, Thomas (1985), using a dredge with a 2.5-inch diameter nozzle on Gold Creek, Montana, found that suspended sediment levels returned to ambient levels 100 feet below the dredge. Gold Creek is a relatively undisturbed third order stream with flows of 14 cubic feet per second. A turbidity tail from a 5-inch (12.7 cm) dredge on Clear Creek, California was observable for only 200 feet downstream. Water velocity at the site was about 1 foot per second (Lewis, 1962).

Turbidity below a 2.5 inch suction dredge in two Idaho streams was nearly undetectable even though fine sediment, less than 0.5 mm in diameter, made up 13 to 18 percent, by weight, of substrate in the two streams (Griffith and Andrews, 1981).

"During a dredging test carried out by the California Department of Fish and Game on the north fork of American River, it was concluded that turbidity was greatest immediately downstream, returning to ambient levels within 100 feet. Referring to 52 dredges studied, Harvey (1982) stated "...generally rapid recovery to control levels in both turbidity and settable solids occurred below dredging activity."

Hassler (1986) noted "...during dredging, suspended sediment and turbidity were high immediately below the dredge, but diminished rapidly within distance downstream." He measured 20.5 NTU 4 meters below a 5-inch dredge that dropped off to 3.4 NTU 49 meters below the dredge. Turbidity from a 4-inch dredge dropped from 5.6 NTU 4 meters below to 2.9 NTU 49 meters below with 0.9 NTU above. He further noted "...water

quality was impacted only during the actual operation of the dredge...since a full day of mining by most Canyon Creek operators included only 2 to 4 hours of dredge running time, water quality was impacted for a short time." Also "...the water quality of Canyon Creek was very good and only affected by suction dredging near the dredge when it was operated."

The US Geological Survey and the Alaska Department of Natural Resources conducted a survey into dredging on Alaska's Fortymile River, which is a river designated as a wild and scenic corridor. The study stated, "One dredge had a 10-inch diameter intake hose and was working relatively fine sediment on a smooth but fast section of the river. The other dredge had an 8-inch intake and was working coarser sediments in a shallower reach of the river. State regulations require that suction dredges may not increase the turbidity of the river by more than 5 nephelometric turbidity units (NTU), 500 feet (=150m) downstream. In both cases, the dredges were well within compliance with this regulation."

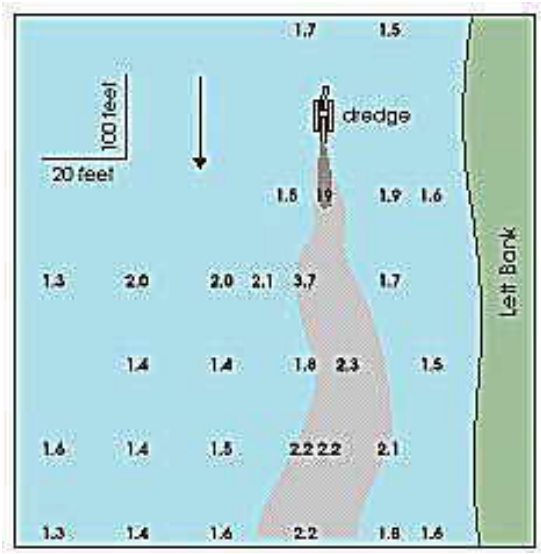

Figure 2. Results of turbidity survey behind an operating 10-inch suction dredge (site #1 on fig. 1). All numbers shown are in NTU, or nephelometric turbidity units; the standard unit of turbidity. The right bank of the river is off the edge of the figure. The approximate shape of the plume is shown in gray. Note that the figure is exaggerated 5x horizontally, so the plume is actually much narrower than it appears in the figure. To comply with State regulations, dredges may not increase the turbidity of the river by more than 5 NTU, 500 feet behind the dredge.

http://www.akmining.com/mine/usgs1.htm

Samples were collected on a grid extending downstream from the dredges as they were operating and compared to measurements made upstream of the dredges. One dredge had a 10-inch diameter intake hose and was working relatively fine sediments on a smooth but fast section of the river. The results of the turbidity survey for the 10-inch dredge are shown on figure 2. Turbidity values behind the 8-inch dredge were lower, because the smaller intake was moving less sediment material, and because the coarser sediments being worked by the 8-inch dredge settled more rapidly

The turbidity values found in the dredge studies fall within the range of turbidity values found for currently mined areas of the Fortymile River and many of its un-mined tributaries. Figure 3 shows the ranges of turbidity values observed along the horizontal axis, and the number of samples that fall within each of those ranges. For example, 25 samples had turbidity between 1.0 and 1.5 NTU, 22 of which were in a dredged area. The

highest turbidity value was from an un-mined tributary to Uhler Creek; the lowest from a number of different tributaries to the North Fork. As seen on the figure, there is no appreciable difference in the distribution of turbidity values between mined and un-mined areas.

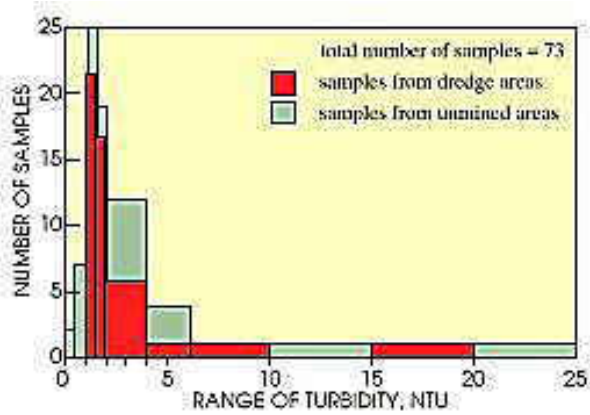

Figure 3. A comparison of turbidity values between mined and unmined areas shows that the suction dredge mining does not affect the turbidity of the Fortymile River system under the conditions studied. The highest turbidity values from the dredge areas are within 200 feet (60 m) of the back of the two operating dredges which were studied.

http://www.akmining.com/mine/usgs1.htm

In American studies, average turbidity levels have been shown to be between 5 and 15 NTU 5 meters below dredges. But even the maximum turbidity level measured in a clay pocket (51 NTU) fell below 10 NTU within 45 meters. Turbidity increases, from even large dredges on moderate sized streams, have shown to be fairly low, usually 25 NTU or less, and to return to background within 30 meters. The impact is localized and short lived; indicating minimum impact on moderate and larger waterways.

Within any waterway, sediment is primarily carried in suspension during periods of rainfall and high flow. This is an important point, as it indicates that a dredging operation has less, or at least no greater effect on sediment mobilization and mobility than a rain storm."

All of these research studies have concluded that only a local significant effect occurs, with it decreasing rapidly downstream. The studies have been wide spread, having been undertaken in Alaska, Idaho, California, Montana and Oregon.

The science supports *de minimus* status for $\leq$ 6-inch suction dredges. Turbidity is *de minimus* according to the U.S. Army Corps of Engineers.

“Effects from elevated levels of turbidity and suspended sediment normally associated with ***suction dredging as regulated in the past in California appear to be less than significant with regard to impacts to fish and other river resources*** because of the level of turbidity created and the short distance downstream of a suction dredge where turbidity levels return to normal” (CDFG, 1997).

Furthermore, individuals that have not, in fact, operated suction dredges may not realize that it is a self-limiting operation. The dredge operator must be able to see his work area to operate safely and manage the intake of the dredge nozzle. ***If high levels of turbidity***

were to flood the dredger's work area and render him "blind" he would have to move the operation to another location.

INCREASING WATER TEMPERATURE

Responsible suction dredge miners do not dredge stream banks (it is illegal). Dredging occurs only in the wetted perimeter of the stream. Therefore, it is unlikely suction dredging will cause a loss of cover adjacent to the stream.

Solar radiation is the single most important energy source for the heating of streams during daytime conditions. The loss or removal of riparian vegetation can increase solar radiation input to a stream increasing stream temperature. ***Suction dredge operations are confined to the existing stream channel and do not affect riparian vegetation or stream shade*** *(SNF, 2001).*

Suction dredging could alter pool dimensions through excavation, deposition of tailings, or by triggering adjustments in channel morphology. Excavating pools could substantially increase their depth and increase cool groundwater inflow. This could reduce pool temperature. If pools were excavated to a depth greater than three feet, salmonid pool habitat could be improved. In addition, ***if excavated pools reduce pool temperatures, they could provide important coldwater habitats for salmonids living in streams with elevated temperatures*** *(SNF, 2001).*

Dredge mining had little, if any, impact on water temperature (Hassler, T.J., W.L. Somer and G.R. Stern, 1986). In addition, the Oregon Siskiyou Dredge Study states, "***There is no evidence that suction dredging affects stream temperature***" *(SNF, 2001).*

Increases in sediment loading to a stream can result in the stream aggrading causing the width of the stream to increase. This width increase can increase the surface area of the water resulting in higher solar radiation absorption and increased stream temperatures. ***Suction dredge operations are again confined to the existing stream channel and do not affect stream width*** *(SNF, 2001).*

Stream temperature can also increase from increasing the stream's width to depth ratio. The suction dredge operation creates piles in the stream channel as the miner digs down into the streambed. The stream flow may split and flow around the pile decreasing or increasing the wetted surface for a few feet. However, within the stream reach that the miner is working in, the change is so minor that the overall wetted surface area can be assumed to be the same so the total solar radiation absorption remains unchanged. ***Suction Dredging results in no measurable increase in stream temperature*** *(SNF, 2001).*

"Small streams with low flows may be significantly affected by suction dredging, particularly when dredged by larger dredges (Larger than 6 inches) (Stern, 1988). However, the California Department of Fish and Game concluded, "current regulations *restrict the maximum nozzle size to 6 inches on most rivers and streams which, in*

conjunction with riparian habitat protective measures, results in ***a less than significant impact to channel morphology***" (CDFG, 1997).

WATER CHEMISTRY

Concern has been raised that small-scale dredge operations may increase the metal load of the surface waters. Whereas dredge operations do re-suspend the bottom sediment, the magnitude of this disturbance on stream metal loading was unknown. It was unknown what affect the dredge operations may have on the transport and redistribution of metals—some of which (for example, arsenic, copper, and zinc) have environmental importance.

The U.S. Geological Survey and the Alaska Department of Natural Resources cooperated in a project, on Fortymile River, to provide scientific data to address these questions. This river is designated a Wild and Scenic Corridor by the Alaska National Interest Lands Conservation Act. Current users of the river include placer mine operators, as well as boaters and rafters. Along the North Fork Fortymile River, and just below its confluence with the South Fork, mining is limited to a few small suction dredges which, combined, produce as much as a few hundred ounces of gold per year. In this area, some potential environmental concerns have been raised associated with the mining activities, including increased turbidity of the river water; adverse impact on the overall chemical quality of the river water; and potential additions of specific toxic elements, such as arsenic, to the river during mining operations.

Field measurements were made for pH, turbidity, electrical conductivity (a measure of the total dissolved concentrations of mineral salts), and stream discharge for the Fortymile River and many of its tributaries. Samples were collected at the same time for chemical analyses, including trace-metal analyses

Water-quality samples were collected at three points 200 feet behind each of the two operating suction dredges. One sample was collected on either side of the plume, and one in the center of the plume. The samples were passed through a filter with a nominal pore size of 0.45 micrometers and acidified to a pH less than about 2. Results are shown in the following table. Samples 1A, 1C, 2A, and 2C are from either side of the plume behind dredges 1 and 2, respectively. Samples 1B and 2B are from the center of each plume. All concentrations given are in micrograms per liter, except pH, which is expressed in standard units.

The data show similar water-quality values for samples collected within and on either side of the dredge plumes. Further, the values shown in the table are roughly equal to or lower than the regional average concentrations for each dissolved metal, based on the analyses of 25 samples collected throughout the area. Therefore, ***suction dredging appears to have no measurable effect on the chemistry of the Fortymile River*** within this study area. We have observed greater variations in the natural stream chemistry in the region than in the dredge areas (Wanty, R.B., B. Wang, and J. Vohden. 1997).

		Side 1	Dredge 1	Side 2		Side 1	Dredge 2	Side 2
		1A	**1B**	**1C**		**2A**	**2B**	**2C**
pH		7.7	7.6	7.8		7.0	7.5	7.5
Arsenic		0.3	0.3	0.3		0.3	0.3	0.3
Iron		110.	110.	110.		100	97	100
Chromium		2	2	3		3	3	3
Cadmium	all less than 0.02 micrograms per liter							
Cobalt		0.07	0.07	0.06		0.06	0.05	0.05
Zinc		0.8	0.6	0.8		1.0	1.0	1.0
Lead	all less than 0.05 micrograms per liter							

A final report from an EPA contract for analysis of the effects on mining in the Fortymile River, Alaska stated, "This report describes the results of our research during 1997 and 1998 into the effects of commercial suction dredging on the water quality, habitat, and biota of the Fortymile River…. The focus of our work on the Fortymile in 1997 was on an 8-inch suction dredge (Site 1), located on the mainstem… At Site 1, dredge operation had no discernable effect on alkalinity, hardness, or specific conductance of water in the Fortymile. Of the factors we measured, the primary effects of suction dredging on water chemistry of the Fortymile River were increased turbidity, total filterable solids, and copper and zinc concentrations downstream of the dredge. These variables returned to upstream levels within 80-160 m downstream of the dredge. The results from this sampling revealed a relatively intense, but localized, decline in water clarity during the time the dredge was operating" (Prussian, A.M., T.V. Royer and G.W. Minshall, 1999).

"The data collected for this study help establish regional background geochemical values for the waters in the Fortymile River system. As seen in the chemical and turbidity data **any variations in water quality due to the suction dredging activity fall within the natural variations in water quality**" (Prussian, A.M., T.V. Royer and G.W. Minshall, 1999).

REMOVAL OF MERCURY FROM THE ENVIRONMENT

Looking for gold in California streams and rivers is a recreational activity for thousands of state residents. As these miners remove sediments, sands, and gravel from streams and former mine sites to separate out the gold, they are also removing mercury. This mercury

is the remnant of millions of pounds of pure mercury that was added to sluice boxes used by historic mining operations between 1850 and 1890. Modern day small-scale gold suction dredgers do not use mercury to recover gold during the operation of the dredge. Therefore, any gold that would be found in their possession would be that which was extracted from the stream or river they are working.

Taking mercury out of streams benefits the environment. Efforts to collect mercury from recreational gold miners in the past, however, have been stymied due to perceived regulatory barriers. Disposal of mercury is normally subject to all regulations applicable to hazardous waste.

In 2000, EPA and California's Division of Toxic Substance Control worked in concert with other State and local agencies to find the regulatory flexibility needed to collect mercury in a simple and effective manner. In August and September, 2000 the first mercury "milk runs" collected 230 pounds of mercury. A Nevada County household waste collection event held in September 2000 collected about 10 pounds of mercury. The total amount of mercury collected was equivalent to the mercury load in 47 years worth of wastewater discharge from the city of Sacramento's sewage treatment plant or the mercury in a million mercury thermometers. This successful pilot program demonstrates how recreational gold miners and government agencies can work together to protect the environment (US EPA, 2001).

Mercury occurs in several different geochemical forms, including elemental mercury, ionic (or oxidized) mercury, and a suite of organic forms, the most important of which is methylmercury. Methylmercury is the form most readily incorporated into biological tissues and is most toxic to humans. The process of mercury removal by suction dredging does not contaminate the environment because small-scale suction dredging removes elemental mercury. Removal of elemental mercury before it can be converted, by bacteria, to methylmercury is a very important component of environmental and human health protection provided as a secondary benefit of suction dredging..

THE REAL ISSUE

The issue of localized conflict with suction dredgers and other outdoor recreational activities can be put into a more reasonable perspective using the data provided at the beginning of this report. For example, the total acreage of all analyzed claims related to the total acres of watershed is about *0.2 percent*. The percentage of land area within riparian zones on the Siskiyou National Forest occupied by mining claims is estimated to be only *0.1 percent*." The report goes on to say, "Over the past 10 years, approximately 200 suction dredge operators per season operate on the Siskiyou National Forest (SNF, 2001).

The issue against suction dredge operations in the streams of the United States appears to be less an issue of environmental protection and more of an issue of certain organized individuals and groups being unwilling to share the outdoors with others without like interests.

Management of the Fortymile River region (a beautiful, wild and scenic river in the remote part of east-central Alaska) and its resources is complex due to the many diverse land-use options. Small-scale, family-owned gold mining has been active on the Fortymile since the "gold rush" days of the late 1880's. However, in 1980, the Fortymile River and many of its tributaries received Wild and Scenic River status. Because of this status, mining along the river must compete with recreational usage such as rafting, canoeing, and fishing.

A press release from the U. S. Geological Survey stated, in part, the following, "The water quality of the Fortymile River-a beautiful, …has not been adversely impacted by gold placer mining operations according to an integrated study underway by the U.S. Geological Survey and the Alaska Department of Natural Resources.

Violation of mining discharge regulations would close down the small-scale mining operations. No data existed before this study to establish if the mining was degrading the water quality. **However, even with the absence of data, environmental groups were active to close down mining on the river citing unsubstantiated possible discharge violations.**

This study has found no violations to date to substantiate closure of the small-scale mining operations. The result is a continuance of a way of life on the last American frontier." (U.S. Geological Survey October 27, 1998). I have no doubt that this is the real issue currently facing small-scale gold suction dredgers in California.

Suction dredges do not add pollution to the aquatic environment. They merely re - suspend and re-locate the bottom materials (overburden) within the river or stream.

I hope this scientific research information I have provided will be helpful in your efforts regarding suction dredge mining and water quality. I thank you for this opportunity to submit this data.

Respectfully Yours,

Joseph C. Greene
Research Biologist, U.S. EPA **Retired**

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"CALIFORNIA SUCTION DREDGE BAN SB 670"

California politicians blunder

It is absolutely established that a valid unpatented placer mining claim is in fact a Statutory Federal Grant of "private property" derived from 30 U.S.C. § 21-54. All unpatented placer mining claims situated in California are on federally owned lands, under jurisdiction of the USFS, or BLM. Otherwise none would exist, as federal land is the only place an unpatented mining claim can be initiated, and held.

As long as the Federal government retains title, the federal interest in providing free access to its own land in order to promote mining is sufficient to preempt any state law that fundamentally bans such use. Thus under standard preemption analysis any state legislation, or regulation that conflicts with this overriding federal purpose, must fail.

Under the Supremacy Clause, any state law that conflicts with a federal law is preempted. Gibbons v. Ogden, 22 U.S. 1 (1824). Any state legislation which frustrates the full effectiveness of federal law is rendered invalid by the Supremacy Clause" regardless of the underlying purpose of its enactors, Perez v. Campbell, 402 U.S. 637, 651-52, 91 S.Ct. 1704, 29 L.Ed.2d 233 (1971)

A conflict exists if a party cannot comply with both state law and federal law. In addition, even in the absence of a direct conflict between state and federal law, a conflict exists if the state law is an obstacle to the accomplishment and execution of the full purposes and objectives of Congress. Crosby v. Nat'l Foreign Trade Council, 530 U.S. 363, 372-73 (2000).

In determining whether a state law is a sufficient obstacle, the courts examine the federal statute as a whole and identify its purpose and intended effects and then determine the impact of the challenged law on congressional intent. State law can be pre-empted in either of two general ways. If Congress evidences an intent to occupy a given field, any state law falling within that field is pre-empted.

If Congress has not entirely displaced state regulation over the matter in question, state law is still pre-empted to the extent it actually conflicts with federal law, that is, when it is impossible to comply with both state and federal law, or where the state law stands as an obstacle to the accomplishment of the full purposes and objectives of Congress. California Coastal Comm'n v. Granite Rock Co., 480 U.S. 572, 581 (1987)

An 1998 8th Circuit Court of Appeals case revolving around near identical prohibitions on unpatented mining claims, wherein holders brought suit claiming that federal mining laws preempted ordinance prohibiting issuance of any new or amended permits for surface metal mining within area which included federal lands. Private landowner intervened to defend the ordinance.

The United States District Court for the District of South Dakota, Richard H. Battey, Chief Judge, 977 F. Supp. 1396, granted summary judgment for plaintiffs and enjoined the ordinance. Intervener appealed.

The Court of Appeals, Hansen, Circuit Judge, held that: (1) preemption claim was ripe, and (2) Federal Mining Act preempted ordinance. Affirmed; South Dakota Mining Association Inc v. Lawrence County, 155 F.3d 1005

The only locatable mineral on the majority of unpatented placer claims held under federal law is placer gold. Which is naturally concentrated in stream or river bed gravels, and usualy no where else in worthwhile amounts. The only economically viable means to profitably recover placer gold in stream or river gravel is by "suction dredging".

Accordingly, suction dredging is the "Highest & Best Use" of placer mining claims. As a matter of fact, it is only viable use, as no other mining method is practical, economical, or profitable.

When the only viable use of an unpatented placer mining claim is by suction dredging, arbitrarily prohibiting that use (even temporarily) effects a complete "taking" of all economic benefit the owner could derive from it, for the duration of the ban.

The Fifth Amendment to the United States Constitution, made applicable to state and local governments by the Fourteenth Amendment, prohibits the government from taking private property for public use without just compensation.

The California Constitution provides, "Private property may be taken or damaged for public use only when just compensation ... has first been paid to, or into court for, the owner." (Cal. Const., art. I, § 19.)

It is well established that just compensation... is the full value of the property taken at the time of the taking, plus interest from the date of taking. United States v. Blankinship, 9 Cir., 1976, 543 F.2d 1272, 1275.

Without doubt, S.B. 670 capriciously deprives thousands of families of their legitimate livelihood, and caused an immediate gross compensatory "taking" of valid existing rights, and compensable private property interests of considerable magnitude.

Neither the USFS, or BLM will enforce this state law, given that that federal statutes, and regulations preempt this suction dredging ban on unpatented placer mining claims situated on federal lands under their control in California. That clearly should give public notice the federal courts will most certainly, and quickly take the same position the USFS/BLM has.

The Treasury of the State of California will ultimately be held liable to pay compensable damages to all those effected, accruing from August 6th 2009 forward. Until at least the illegal ban on suction dredging unpatented placer mining claims is lifted, or if necessary overturned by appropriate federal court action.

Plainly, Senator Wiggins who introduced this Bill, all the legislature that voted for it, and even the Governor failed to have S.B. 670 analyzed for critical federal preemption flaws, or significant "takings" liabilities it would create.

It would seen astute on the part of the California legislature to limit state financial liabilities here by swiftly correcting this law, to effect only a suction dredging ban on fee simple lands in California, which federal law may not preempt.

If not corrected quickly, state coffers will needlessly expend precious funds in paying attorney fees, and costs attempting to delay the inevitable overruling of S.B. 670 illegal provisions in federal court. Involved compensatory damages could well approach $50,000,000 annually. If ignored, those applicable damages will certainly compound over time with interest, costs and attorney fees applied.

California politicians should ponder that the 3,200 other current California suction dredge permit holders, and approximately 21,000 other similarly situated owners of unpatented placer mining claims on federal lands in California will justifiably require compensation for their loss's S.B 670 directly caused them.

Once all affected are joined in a class action, which will most certainly prevail. Who do these politicians think will be billed for that compensation? Without question, it will most certainly be the treasury of the state of California.

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"Under the mining laws a person has a statutory right, consistent with Departmental regulations, to go upon the open (unappropriated and unreserved) Federal lands for the purpose of mineral prospecting, exploration, development, extraction and other uses reasonably incident thereto." (See 30 U. S.C. § 21-54, 43 C.F.R. § 3809.3-3, 0-6).

Federal mining claims are "private property" Freese v. United States, 639 F.2d 754, 757, 226 Ct.Cl. 252 cert. denied, 454 U.S. 827, 102 S.Ct. 119, 70 L.Ed.2d 103 (1981); Oil Shale Corp. v. Morton, 370 F. Supp. 108, 124 (D.Colo. 1973).

This possessory interest entitles the claimant to "the right to extract all minerals from the claim without paying royalties to the United States." Swanson v. Babbitt, 3 F.3d 1348, 1350 (9th Cir. 19930).

16 U.S.C. § 481, Use of Waters: All waters within boundaries of national forests may be used for domestic, mining, milling, or irrigation purposes under the laws of the state wherein such national forests are situated or under the laws of the United States and the rules and regulations established thereunder.

"Uncompensated divestment" of a valid unpatented mining claim would violate the Constitution. Freese v. United States, 639 F.2d 754, 757, 226 Ct.Cl. 252, cert. denied, 454 U.S. 827, 102 S.Ct. 119, 70 L.Ed. 2d 103 (1981).

Even though title to the fee estate remains in the United States, these unpatented mining claims are themselves property protected by the Fifth Amendment against uncompensated takings. See Best v. Humboldt Placer Mining Co., 371 U.S. 334 (1963); cf. Forbes v. Gracey, 94 U.S. 762, 766 (1876); U.S.C. A.Const. Amend. 5; North American Transportation & Trading Co. v. U.S., 1918, 53 Ct.Cl. 424, affirmed 40 S.Ct. 518, 253 U.S. 330; United States v. Locke, 471 U.S. 84, 107, 105 S.Ct. 1785, 1799, 85 L.Ed. 2d 64 (1985); Freese v. United States, 639 F.2d 754, 757, 226 Ct.Cl. 252, cert. denied, 454 U.S. 827, 102 S. Ct. 119, 70 L.Ed. 2d 103 (1981); Rybachek v. United States, 23 Cl.Ct. 222 (1991).

A valid location, though unpatented, is a grant in the nature of an estate in fee and if such an estate is taken by the United States, just compensation must be made. See U.S.C.A. Const. Amend. 5, North American Transportation & Trading Co. v. U.S., 1918, 53 Ct.Cl. 424, affirmed 40 S.Ct. 518, 253 U. S. 330

Such an interest may be asserted against the United States as well as against third parties (see Best v. Humboldt Placer Mining Co., 371 U.S. 334, 336 (1963); Gwillim v. Donnellan, 115 U.S. 45, 50 (1885)) and may not be taken from the claimant by the United States without due compensation. See United States v. North American Transportation & Trading Co., 253 U.S. 330 (1920); cf. Best v. Humboldt Placer Mining Co.

For further information on federal preemption law, the internet link below gives a basic explanation.

http://en.wikipedia....eral_preemption

- RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 06:49 AM, (1)
  - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 06:51 AM, (2)
    - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 06:55 AM, (3)
      - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 06:58 AM, (4)
        - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 07:01 AM, (5)
          - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 07:05 AM, (6)
            - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 07:10 AM, (7)
              - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 07:14 AM, (8)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 07:33 AM, (9)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 07:35 AM, (10)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 07:36 AM, (11)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 07:42 AM, (12)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 07:52 AM, (13)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 07:53 AM, (14)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 07:55 AM, (15)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 07:58 AM, (16)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 08:00 AM, (17)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 08:01 AM, (18)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 08:02 AM, (19)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 08:03 AM, (20)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 08:05 AM, (21)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 08:07 AM, (22)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 08:09 AM, (23)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 08:44 AM, (24)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 09:14 AM, (25)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 09:27 AM, (26)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 10:51 AM, (27)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 02:17 PM, (28)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-16-09, 10:31 PM, (29)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-18-09, 05:54 AM, (30)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-18-09, 08:53 AM, (31)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-18-09, 09:00 AM, (32)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-18-09, 09:03 AM, (33)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-18-09, 09:12 AM, (34)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-18-09, 09:23 AM, (35)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-18-09, 09:31 AM, (36)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **russau**, 11-19-09, 06:50 AM, (37)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **jerhobbs2** , 11-19-09, 11:10 AM, (38)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-19-09, 01:21 PM, (39)
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                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-20-09, 03:44 AM, (41)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-20-09, 02:22 PM, (42)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-20-09, 02:58 PM, (43)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **dredgeman**, 11-20-09, 03:03 PM, (44)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-20-09, 04:19 PM, (45)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **Gold Seeker**, 11-20-09, 05:25 PM, (46)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **Mark_NC**, 11-20-09, 05:30 PM, (47)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-20-09, 06:38 PM, (48)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **Goldfinds**, 11-20-09, 07:05 PM, (49)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-20-09, 08:30 PM, (50)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-20-09, 10:03 PM, (51)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-21-09, 02:32 AM, (52)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-21-09, 06:14 AM, (53)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **russau**, 11-21-09, 06:21 AM, (54)
                - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-21-09, 06:57 AM, (55)
- RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **Goldfinds**, 11-22-09, 02:18 PM, (56)

- RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **El Dorado**, 11-22-09, 04:39 PM, (57)
  - RE: CALIFORNIA SUCTION DREDGE BAN SB 670, **OLD GOLD MINER**, 11-22-09, 08:01 PM, (58)

OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 06:49 AM (MDT)

1. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #0

Apply common sense:

Environmental zealots claim that small scale suction dredging to recover placer gold is harmful to, and kills indigenous fish.

Fact: Numerous unbiased scientific studies on the subject clearly show the effects of small scale suction dredging has a "de minimis" impact, meaning no discernable, or extremely minimal effect on fisheries.

http://www.icmj.com/...redge-study.pdf

Fact: Prior to the passage of SB 670 (which illegally bans all suction dredging state wide) suction dredging throughout California was strictly prohibited in waterways during fish spawning seasons, to further minimize any possible negative impact.

Environmental zealots who sponsored SB 670 used biased propaganda (rather than sound scientific evidence) to gain support for SB 670 from California sports fisherman. Who threw consider political weight behind SB 670.

:REALITY CHECK:

> sports fishing KILLS fish <

California politicians appear to believe that its perfectly proper for approximately 3 million California fishermen to kill fish as a leisure sport. Assuming each fishermen catches a few, the fish kill in California waterways directly attributable to sports fishing alone amounts to many millions annually.

:MORE REALITY CHECK:

> Hydroelectric dams throughout California are known to KILL fish<

>Draw downs of water flow for agricultural irrigation is known to kill fish<

>Runoff from agricultural fertilizers & pesticides is known to kill fish<

>Commercial fishing kills fish<

>Industrial pollution is know to kill fish<

The aforesaid are primary causes of fish habitat degradation & fish kills, amongst the many other factors known to kill fish

Not one single fish has ever been known to have been killed attributable to the 3, 200 California suction dredge permit holders

To BAN all suction dredging in California to determine it's effect on indigenous fish is ludicrous, capricious

& illogical

Numerous credible unbiased scientific studies of the effects of small scale suction dredge gold mining have been performed by various state & federal agencies in the last three decades, throughout Alaska & the western United States.

Rather than Ban suction dredging in California for an indeterminate amount of time, to perform an independent environmental study report, at great cost.

If the California DF&G were competent?

They could easily, and quickly compile those credible reports from all applicable state & federal agencies. Then draw fair unbiased scientific conclusions from them. Which, without doubt would show suction dredging has a "de minimis" impact, legally meaning no discernable, or extremely minimal effect on fisheries.

To perform an independent lengthy environmental study, at considerable taxpayer expense. When numerous credible studies of the same subject already exist.

Is a clear unequivocal illogical WASTE of taxpayers funds.

Moreover, the ban on suction dredging SB 670 implements will without doubt, be rapidly be overturned in Federal court. Because such law is plainly preempted by statutory federal law.

Again, in attempting to defend illogical, and illegal state actions, politicians of California will most certainly compound their errors, and waste more taxpayer dollars.

http://www.swrcb.ca....om_chambers.pdf

http://www.akmining....ine/fsyards.htm

http://www.recminer....onal_mining.htm

http://afsjournals.o...DO%3E2.0.CO%3B2

http://afsjournals.o...ournalCode=fima

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 06:51 AM (MDT)

2. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #1

THE FACTS OF THE MATTER:

Almost all suction dredging for gold in California takes place on unpatented placer mining claims initiated under the general mining laws of the United States.

"Under the mining laws a person has a statutory right, consistent with Departmental regulations, to go upon the open (unappropriated and unreserved) Federal lands for the purpose of mineral prospecting, exploration, development, extraction and other uses reasonably incident thereto." (See 30 U. S.C. § 21-54, 43 C.F.R. § 3809.3-3, 0-6).

In law, the word "claim" in connection with the phrase "mining claim" perfected with a valid mineral discovery, represents a federally recognized right in real property. The Supreme Court has established that a mining "claim" is not a claim in the ordinary sense of the word a mere assertion of a right, but rather, is a property interest, which is itself real property in every sense, and not merely an assertion of a right to a property.

Once established, a valid unpatented placer mining claim gives the owner the right (not a mere privilege) to extract the valuable mineral therein, because plainly the valuable mineral there clearly belongs to him, as the owner. Certainly, that right is subject to reasonable regulation by applicable state law. But, not "unreasonable" state regulation that would abrogate everything the owner owns.

To initiate a valid unpatented placer mining claim is not a quick, easy or inexpensive task. It requires considerable investment in research, time, travel expense, labor, exploration, staking & cost about $200 in initial county & BLM filing fees. That all under the prerequisite that the person can find federal land that contains valuable mineral, is not withdrawn from mineral entry, and is not covered by any prior placer claim. All in all, valid placer claims are a rare, and valuable. Simply because good ones to stake & file are very difficult to find.

If a person cannot find one to stake & file themselves, they often buy one. The purchase price ranging from a few thousand dollars, to tens of thousands of dollars, sometimes even more. Once a person owns a valid placer claim, it is subject to state property tax, and annual BLM title maintenance fees usually amounting to around $225 a year. All this is based on reasonable investment based expectations, that the owner will recover his cost, and expenses by extracting valuable mineral, usually placer gold from his mining claim.

The majority of placer gold found in this era is usually concentrated in active stream, or river bed alluvial gravels, most often on or near bedrock. Simply because almost all dry bench or higher elevation gravels from ancient stream or river gravels were mined out long ago. The most efficient economical means to recover placer gold in worthwhile amounts is plainly by suction type dredging.

Small relatively portable suction dredges that one person, or two can operate range in cost from approximately $2,000 to $20,000 dollars each. A trailer is required to haul a suction dredge, as well as a suitable vehicle to pull that trailer. Additional gold recovery equipment is usually required, which adds considerable costs

Access points to isolated dredging sites often require 4 wheel drive vehicles to get to. Which is usually not a normal family type vehicle used every day. Given the brushed in old unmaintained roads, and rugged terrain these vehicles usually have to traverse to get to worthwhile suction dredging sites could, or would damage a normal street vehicle, not strictly dedicated to mining purposes.

Total investment by California suction dredge miners, to placer mine can range from a few thousand dollars, to near $100,000 each. Dependent on the cost of the mining claim, and equipment required to effectively & profitably mine it. By no means can an investment of that magnitude be considered recreational.

The incentive to find, initiate or purchase a mining claim to suction dredge is to recover placer gold in profitable amounts. The same "for profit" motive as any business has. Those who do, also enjoy

the outdoor setting, labor and comradely involved. It's hard work that sometimes pays little, or with perseverance & dedication, can pay a lot.

Teaching my children, and now my grandchildren to prospect, and pan for gold, is one of the great pleasures of my life. Unearthing placer gold that has been buried for millions of years, your eyes the first to see it, your hands to touch it, is a wonder by itself. It takes a certain type of man, to appreciate such rare things. Thank God, men of that quality & caliber still exist.

The bottom line here is this.
Unpatented placer mining claim owners;
1. Own exclusive mining rights to mine their own property.
2. The law allows those same owners the right to use the most efficient means to do that.
3. Suction dredging is most often the means of choice, as being the most practical.
4. Suction dredging has the most negligible effect on the environment.
5. A total ban on suction dredging for any indefinite period is not lawful.
6. CA DF&G is already in contempt to court, for not completing the EIS study.
7. Once a challenge is filed in federal court, the ban will be overturned.
8. The state of California almost certainly will be held liable for compensatory damages.

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 06:55 AM (MDT)

3. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #2

http://www.dfg.ca.go...4/TitlePage.pdf

3.6.6 SUCTION DREDGING
Suction-dredge placer miners extract gold from the river gravels by sucking the gold- bearing gravels through a nozzle (typically 6 to 8 inches in diameter) into floating dredges, pumping the gravel and water mixture across a settling table where the gold concentrates by gravity, and then discharging the gravel and water back into the river. Both the pump and the sluice box are usually mounted on a floating platform, often positioned over the work area by ropes or cables secured to trees or rocks. The portion of stream bottom dredged ranges from a few small excavations to the entire wetted area in a section of the stream. Larger suction dredges have the capacity to process as much as several cubic yards of gravel from the river bottom at one time.

An annual permit from the Department (Title 14 California Code of Regulations , §228) and, in some circumstances, a Lake and Streambed Alteration Agreement (FGC §1600) is required to engage in this activity. Dredging activities in freshwater environments can have a variety of direct impacts on the environment, including impacts on aquatic and riparian organisms (Griffith and Andrews 1981; Thomas 1985; Harvey 1986) and channel stability. Impacts can also result from the potential release of hazardous materials such as mercury into aquatic and terrestrial environments. However, there are no studies that document such dredging-related impacts on coho salmon or their habitat within the range of coho salmon. The restrictions currently imposed by regulations on this activity are designed to eliminate the potential for impacts to coho salmon by restricting suction dredging actions to locations and times when such activities should not impact the species.

DF&G 2004 report above is WRONG, in that 6 to 8 inch suction dredges are NOT typical.

Typical for placer gold mining is 3, 4 or 5 inch suction dredges.

It is also WRONG, in that there are numerous studies available.

For instance:

http://www.nwfsc.noa...s/tm24/tm24.htm

Take note: Existing studies show suction dredging has a negligible impact, so small there is no mention of suction dredging in the study above.

Now, it gets comical, CA DF&G states:

"The restrictions currently imposed by regulations on this activity are designed to eliminate the potential for impacts to coho salmon by restricting suction dredging actions to locations and times when such activities should not impact the species."

If the potential impact is already eliminated.
Why would a EIS need to be performed?

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 06:58 AM (MDT)

4. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #3

Listed below is a number of quotes from studies that have been done over the years, please keep in mind that some were done on large 50 + cubic yard per hour placer mining operations, others were done on a variety of suction dredges, and some were done in a laboratory environment. All were done by well respected and educated people only a few of which have had any practical experience with placer mining/prospecting. The quotes listed in this document were taken word for word out of the documents written by the scholars named above each quote.

A. By: Paul J. Badali - 1988

"Several federal and state laws charge various governmental agencies to provide for the protection of these habitats. Our nation's technology based society has an ever increasing need for mineral resources, gold included. An ever growing number of people enjoy Recreational Gold Dredging as a hobby. Suction dredge operators working valid federal mining claims have a constitutional right under the 1872 mining laws to recover the valuable minerals present in the substrate. Private property owners and holders of state minerals leases also have rights to recover gold and other minerals present in streams and rivers. How can the country's need for natural resources, the individual's right or desire to mine, and need to protect the environment all be realized and satisfied?"

II. ENTRAINMENT

A. By: Phillip A. North - 1993

"While adult fish did not show a sensitivity to entrainment it is unlikely that they would be sucked into a dredge in the first place. They have the ability to avoid entrainment in a suction dredge by moving to a safer location. All of the investigators who examined the impacts of suction dredges on adult fish concluded that this life stage was not acutely affected (Harvey 1986, Hassler et al. 1986, Summer and Hassler 1992). Harvey (1986) found this to be the case for rainbow trout on streams he studied in California."

III. FEED AND FISH

A. By Dr. Henry Baldwin Ward

"most significant is a possible relation of fine silt to the food of young fish. It has been shown that the presence of finely divided suspensoids of natural origin may be of advantage to the microbiota which constitutes the foundation element in the food supply of water. Studies on aquatic biology

conducted by the Wisconsin Survey demonstrated that colloidal organic particles collect on carbon and sand grains to build a culture medium for aquatic bacteria".

B. By: Thomas J. Hassler, William L. Somer, Gary R. Stern - 1986

"During diving surveys, we observed Salmon gairdneri congregating and selectively feeding on benthic invertebrates displaced by dredging."

"Suction dredge mining at levels observed in Canyon Creek probably did not impact steelhead feeding. The mining did not significantly reduce the abundance of aquatic invertebrates (only species composition locally) and steelhead fed opportunistically. In fact , juvenile steelhead were observed feeding on invertebrates that had been entrained in and dislodged by dredge. Thomas (1985) observed cutthroat trout feeding on dislodged invertebrates in the dredge outfall. "However, weight of juvenile steelhead from Canyon Creek was greater than weight from other areas and production (kg/ha) was as good or better than in other areas (table 41)." "Ecological differences between Canyon Creek and BEF were also important in determining colonization of samplers. Overall, the impacts of suction dredge mining to benthic invertebrates at the study site were minimal."

C. From: Robert Lewis, Pollution Bioanalyst III - 1962

"Benthos survival is noted in Table 2. Insects with internal extrusions were listed as mortalities. The morality figure of 7.4 percent may be extreme because of confinement in the sack. Many caddis larvae were still attached to rocks after passing through the dredge. All insects except those with extrusions appeared lively and unharmed."

"To determine stream distance necessary for insects to settle back to the bottom, a net was placed 15 feet and 25 feet downstream from the outflow. After five minutes at the former distance, Trichoptera, Coleoptera and Diptera were prevalent in the net. Only one Plecoptera was noted. At 25 feet downstream only few insects were caught in the net after five minutes. Underwater inspection with a faceplate indicated that all insects settled within 40 feet. The approximate flow throughout this distance varied from 1 ft./sec. down to 0.5 ft./sec."

D. By: Phillip A. North - 1993

"If recolonization is slow the cumulative impacts of suction dredge mining could be significant over a period of seasons. However, in all of the studies on suction dredges that investigated this question the disturbed stream reach was relatively short (on the order of a few tens of meters) and recolonization proved to be rapid. Griffith and Andrews (1981) found that the dredged site was "substantially recolonized" after 38 days. The abundance within orders of invertebrates were the same before and after dredging and "key" taxa were also the same. Harvey (1986) found that recolonization was complete in terms of numbers of insects within 45 days of dredging. Thomas (1985) sampled the site 30 days after dredging and found, again, that colonization was "substantially complete" for most groups. The number of invertebrates colonizing the artificial substrates used by Somer and Hassler (1992) did not increase after the first sampling at two weeks. None of these investigators sampled their study site earlier than the reported time of recolonization. Recolonization may have occurred sooner than the time reported."

E. By: The U.S. Environmental Protection Agency - 2001

"The results from Resurrection Creek indicated that there was no difference in the macroinvertebrate community between the mining area and the locations downstream of the mining area in terms of macroinvertebrate density and taxa richness. The sampling was done 35 days after mining had been completed for the season and shows a rapid recovery of the mined areas."

IV. FLUSHING FLOWS

A. By: Gary R. Stern - 1988

"The autumn, winter and spring peak flows of WY 1985 Canyon Creek were adequate to disperse dredge tailing piles and fill in dredge holes. Less than 9% of the holes and tailings from 1984 mining

were visible at the start of the 1985 dredge season. Only two sites from 1984 had clear remnants of holes and tailings in 1985. Both of these were far from the stream's thalweg. At a few sites large cobbles and boulders piled along the shore remained visible one year later. Thomas (1985) reported that piles of cobbles remained along the shore one year later at Gold Creek, Montana, but holes and instream tailings had vanished. Harvey et al. (1982) found virtually no evidence of dredge mining the following year in the American River, California. Most streams with mobile beds and good annual flushing flows should be able to remove the instream pocket and pile creations of small suction dredges, although regulated streams with controlled flows may not."

V. SEDIMENT

A. By: Dr. Henry Baldwin Ward

"All of these tests show .That the amount of colloidal material in the water of the Rouge River and its tributaries below the point at which the run-off of placer mine workings has been added to the stream is to small to produce on the bottom a "blanket" which might affect adversely young fish eggs in the nests if present, or the fish food in the water." "Even below the points at which tributaries entered from areas in which placer mining had gone on at earlier months in the year, no change from normal conditions were observed. The pools sheltered migrating fish; they were also seen in the stream below the dams, and a normal supply of fish food was found at various points visited."

These studies were done on commercial placer mining!

"The supplementary report of Mr. A. M. Swartley, who aided me in the part of the survey made in September, 1937, is of value in giving the views of a careful and experienced geologist. He confirmed fully statements I had reached in my preliminary report as to the physical conditions found in the Rogue River drainage, and especially the small amount of clay and other material on shores and stream bottoms, in backwaters and otherwise in our examination of the river and its tributaries. He discussed fully the methods of rock disintegration and the transportation and ultimate character of the materials produced. He emphasized the fact that mining debris "is chemically inert, makes no oxygen demand on the stream and therefore takes away from the flowing water nothing which the fish require. This is equally true of this material whether placed in transit by nature or by man since (the products) are alike in nature, come from the same sources and are only being accelerated by man in their journey to the sea." Further he stated:" All these materials entering the streams, whether by natural or human activity, whether coarse or fine, whether traveling on the bottom, in suspension or solution ,are almost altogether inert, suffer little change on their way to the sea, and having reached the end point of chemical change do not rob the water of oxygen which the fish demand, or add to the water toxic agents injurious to fish (fish food or other forms of life)."

VI. EFFECTS OF SILT ON FISH

A. By: Dr. Henry Baldwin Ward

"I have seen among these Alaska rivers in which salmon run and spawn some so heavily loaded with mud that one could not trace the body of an adult salmon ascending the river even when the dorsal fin cut the surface of the water. Yet the fish examined on the spawning grounds just before and just after death showed that the gills had suffered no injuries on the way though the body had met with conspicuous external damage through violent contact with sharp rocks at rapids or falls or along the shore. The examination was made in connection with the study on the cause of death after spawning and all organs were closely inspected. The gills were reported as apparently in perfect condition. Although the object of the investigation was not to determine the effect on the gills of silt loaded waters, still, if any evident injury had been present, it would have been noted. The journey up the Copper and its tributary was long and strenuous; the chance for damage to the salmon from muddy water was certainly large if any damage could be wrought by such conditions, and yet none was observed. Many other similar cases could be cited from printed as well as published records."

"Despite their far greater sensitiveness to changes in environment and susceptibility to injury, the young salmon lived heartily in a concentration of sediment which was at its minimum (760 ppm) twice as much as the maximum recorded at Agness (see Table II). Indeed the average amount of turbidity in Griffin's experiments was ten times the average recorded at Agness. Those who think that normal erosion products will prove injurious to such fish should examine carefully the records in these tables."

VII. EFFECT ON SPAWNING GROUNDS

A. By: Dr. Henry Baldwin Ward

"Normally the fish cover the eggs by a layer of sand or fine gravel; the fresh water carrying oxygen easily penetrates this cover and the young wriggle out after the eggs hatch. A thin, broken layer such as I have already described would not interfere with the permeation of fresh water with oxygen and the development of such eggs as might be present. But I am clear that this is not a true spawning area. As Mr. Joseph Wharton said in an admirable paper on the salmon of the Rogue River, "It is the ambition of all these species of anadromous fish to ascend the river to the highest point attainable before making their spawning beds, seeking the waters that are purest and coldest." This statement is absolutely correct; In difficult streams or when held behind man-made barriers, these fish struggle to the end to make their way upstream and will sacrifice life rather than accept spawning areas in the lower reaches of the river. The urge which drives them on is the basis for the safety of the race. For the straggler or the weakling who may find the achievement of headwaters impossible, an enforced spawning in the lower river is of no significance; the river level varies too widely and its current at full flood is too fierce. Eggs deposited at high water will be exposed and die when the water falls; or if the spawning occurs at a lower water level, the next flood waters will bury the eggs or sweep them away. The suddenness, the violence and the irregularity of the changes in water level of the Rogue are conspicuous in the records of every year."

B. By: Thomas J. Hassler, William L. Somer, Gary R. Stern

"Dredge tailings are often referred to as good salmonid spawning substrate. In the Trinity River, chinook salmon have been observed spawning in the tailing piles of suction dredges (E. Miller pers. comm.). Steelhead in Idaho streams have been reported to spawn in gravels recently disturbed by human activities (Orcutt et al. 1968). In the American River , Prokopovich and Nitzberg (1982) have shown salmon spawning gravels have mostly originated from old placer mining operations."

"Anadramous salmonids held and spawned in Canyon Creek in close proximity to suction dredge activity. During the 1984-1985 spawning season, fall-run chinook salmon, coho salmon and steelhead spawned in areas actively dredged during the 1984 dredge season (fig.). In August 1985, spring-run chinook salmon and summer-run steelhead were holding near areas where suction dredges were being operated (fig. 23). During the 1985 spawning season, fall and spring-run chinook salmon spawned in areas actively dredged during the 1985 dredge season (fig. 24)."

C. By: Gary R. Stern - 1988

"Suction dredge mining did not appear to influence the locations of adult anadramous salmonid summer-holding areas. One spring-run chinook salmon was observed 50 m below an operating dredge and a summer-run steelhead was seen at the upper end of a 30 m-long pool while a dredge was operating at the lower end. Seven other adult salmonids were observed within 250 m of an active dredge operation and none appeared to be disturbed by mining activities. During a 1980 diving survey by Freese (1980), an adult spring-run chinook salmon was observed holding at the bottom of an abandoned dredge hole in Canyon Creek and other adult salmonids were found in close proximity to active dredges. No relation between holding areas of spring/summer-run fish and suction dredge mining operations was apparent during this study or in 1980 (L. Freese pers. comm.)."

VIII. CHANGES IN THE STREAM BED

A. By : Dr. Henry Baldwin Ward

"To be sure no one can think rightly of the stream itself as a constant environment. On the contrary it is undergoing continual change. The amount and location of winter's snowfall, the volume and time of seasonal rains, the duration and precise period of regional droughts, and other climatic variations produce variations in water level, in bank erosion, in growth of grasses, underbrush and trees in the drainage basin; thus sudden and often extreme changes in contours of the banks and surrounding country add sediments of different types to its waters and modify the conditions under which the fish it harbors are forced to live." Number one on the list of things that change the shape of the stream bed are DAMS!"

B. By: Thomas J. Hassler, William L. Somer, Gary R. Stern - 1986

"However during the suction dredge mining process, a new pool area is created by the cone shaped dredge hole. Dace, suckers and juvenile steelhead were observed feeding and resting in Canyon Creek dredge holes. Freese (1980) observed a small spring-run chinook salmon holding in a dredge-created pool on Canyon Creek".

"The majority of suction dredge operators in canyon creek did not work long periods or disturb large areas of the streamed. Dredging impacts upon the channel geomorphology were confined to the area dredged and the area immediately down stream."

"Winter and spring flushing flows filled in dredge holes and dispersed tailing piles." "Coho salmon and steelhead juveniles appeared to rear normally in the creek and were observed using dredge holes in the summer. Steelhead juveniles received the greatest exposure to dredging activity as they rear in Canyon Creek up to three years, but their feeding, growth and production did not seem to be impacted at the current level of dredge activity."

C. By: Somer and Hassler - 1992

"The effects of the two dredges on aquatic insects varied with taxa and were site specific. Dredging dislodged insects, and we observed young coho salmon and steelhead feeding on them. The stream underwent major but localized changes. Dredge hole were excavated to a depth of 2 m, and substrate was altered to bedrock and large cobbles-probably a poor habitat for colonization. However, the effects of dredging (at the operating level during the study) on insects and habitat were minor compared with those of bed-load movement due to large stream flows during storms and from snowmelt."

D. By: Gary R. Stern - 1988

"Lewis (1962) was the first to investigate the effects of the portable suction gold dredge on the aquatic habitat of fish and benthic invertebrates. He operated a 12.7 cm aperture dredge in Clear Creek, Shasta County, California and found that dredging could improve the intergravel environment for both fish eggs and benthos if the stream was mined in a uniform manner."

"If dredge mining regulations were expounded upon and miners were made aware of the instream habitat needs of salmonids, the most serious impacts of suction dredge mining could be reduced. Suction dredgers may even be able to enhance certain areas of the channel for rearing and spawning fish, if some of the limiting factors of a reach of stream are identified (ie. cover, woody debris, low velocity refuges, clean gravels). In Canyon Creek, current CDFG suction dredge regulations eliminate conflicts with salmonid spawning, incubation, and fry emergence by restricting mining to summer months. The 15.24 cm maximum aperture size for dredges is appropriate since stream substrate is large, but larger apertures may be too disruptive in the small channel."

E. By: Robert Lewis, Pollution Bioanalyst III

Results of Gold Suction Dredge Investigation;

"Table 1 lists stand pipe results. The site average indicates an improvement from dredging of 1 p.p.m. in DO and a threefold improvement in permeability and velocity. As indicated above, dredged sand settled within 12 feet of the sluice outflow. This occurrence tends to somewhat nullify removal of sediment, but dredged areas are definitely relieved of compaction. As a gross measure, the standpipe was much easier to drive in the dredged area. As evidenced by photographs the gravel appears much cleaner after dredging. Weighing all factors, dredging can improve the gravel environment for both fish eggs and aquatic insects, especially if the operator mined uniformly in one direction as opposed to a pocket and pile method."

F. By: Phillip A. North - 1993

"The four studies that I reviewed from journals subject to peer review consistently found that when

certain limitations are placed on suction dredge activity the impacts on the stream ecosystem are local and of short duration."

G. By: Bret C. Harvey - 1986

"Fish and invertebrates displayed considerable adaptability to dredging, probably because the streams naturally have substantial seasonal and annual fluctuations (Moyle et al. 1982). These fluctuations, in the form of flushing winter flows, can greatly reduce the long term impact of dredging. Even during the relatively mild winter of 1980/81, high flows still filled the hole created by dredging on NFAR with a sand and gravel mixture and eliminated all sand from the main streamed. After the high flows in winter and spring of 1981/82, no substrate changes caused by dredging in the previous summer were evident on Butte Creek. Saunders and Smith (1965) observed a quick recovery in the trout population after scouring of a heavily silted stream, which, along with the quick temporal recovery of stream insects seen in this study, implies that suction dredging effects could be short-lived on streams where high seasonal flows occur."

IX. TEMPERATURE

A. By:Thomas J. Hassler, William L. Somer, Gary R. Stern - 1986

"and dredge mining had little, if any, impact on water temperature."

X. TURBIDITY

A. By: Dr. L. E. Giiffin

"When the test ended on Dec. 30, it was found that a much larger proportion of the fish in the sediment -containing trough had survived (56%) than in the clear water trough (10%). There was no noticeable difference in the color of the surviving fish in the two troughs, and the fish which had lived in the muddy water were as large as the survivors from the clear-water trough."

"The results of the experiments indicate that young trout and salmon are not directly injured by living for considerable periods of time in water which carries so much soil sediment that it is made extremely muddy and opaque. They also indicate that cutthroat trout and salmon fingerlings can feed and grow apparently well in very muddy water."

B. By: Dr. Henry Baldwin Ward

"In contrast with all these the experiments of Dr. Griffin have shown that young fish live well up to 30 days in good water mixed with an amount of natural soil materials from two to three times as large as the extreme load of the materials contributed to the Rogue River by maximum conditions produced by placer mining."

"All the evidence that has been obtained justifies the conclusion that no present-day contributions of materials produced by bank erosion differ in character or exceed in amount those added periodically by purely natural processes in past times. Splendid runs of salmon and steelhead were established and maintained under truly natural conditions which certainly were on occasion more extreme and violent before man ever came into the picture than they are today. Furthermore, there is good reason to believe that placer mining run-off was larger in amount and more continuous in the early years of that industry when for a time at least greater areas were followed than are employed today."

This study was done to study the effects of large scale placer mining operations!

XI. WATER QUALITY

A. By: Thomas J. Hassler, William L. Somer, Gary R. Stern

Water quality was impacted only during the actual operation of a suction dredge. Since a full day of mining by most Canyon Creek operators included only 2 to 4 hours of dredge running time, water

quality was impacted for a short time.

B. By: Gary R. Stern - 1988

"Turbidity plumes below suction dredges are often markedly visible due to extremely low ambient turbidity levels in mountain streams. The extent of the plume depends on the grain size and volume of the material passing through the dredge. Horizons of silt-laden substrate were disturbed at all dredge sites in Canyon Creek and created highly visible turbidity plumes. "

"Although distinct to even the most casual observer, dredge plumes in Canyon Creek were probably of little direct consequence to fish and invertebrates. Suspended sediment concentrations of 20,000 to 100,000 mg/l which impact fish feeding and respiration (Cordone and Kelly 1961) greatly exceed the highest level of 274 mg/l measured in Canyon Creek. In general, dredge turbidity plumes were highly localized and occurred during midday which is not a peak feeding period for steelhead (Moyle 1976). Laboratory studies by Sigler et al. (1984) found that steelhead and coho salmon preferred to stay in channels with clear water, and turbidities as little as 25 NTU's caused a reduction in fish growth. In contrast to Sigler's results, young steelhead in Canyon Creek appeared to seek out dredge turbidity plumes to feed upon dislodged invertebrates even though clear flowing water was available nearby."

C. By: Phillip A. North - 1993

"Most water quality studies of the effects of suction gold dredges on streams have focused on turbidity and suspended sediments. These studies have, with some exceptions, largely found that water quality is impacted for a distance downstream of the dredge ranging from a few meters to 30 meters."

"However, Huber and Blanchet (1992) found no evidence of cumulative impacts of mining on water quality in streams of the Chugach National Forest in Alaska. They monitored streams in the Forest over a period of three years and found no noticeable impact to water quality associated with suction dredges. All of the studies that I surveyed came to the same conclusion: suction gold dredging had localized and short term impacts. Caveats must be taken into account when coming to this conclusion:

All of these studies, except one involved small dredges, 6 inches or less. The one study that involved a larger dredge reported only a small amount of data. Five water samples were taken 500 feet below a six inch dredge and one sample was taken 500 feet below an 11 inch dredge."

D. By: The U.S. Environmental Protection Agency - 2001

"In the 1997 permit, EPA defined a small suction dredge as those with nozzles less than or equal to four inches. EPA is proposing to redefine the small suction dredge range as less than or equal to six inches. Information provided in EPA's suction dredge study and the United States Geological Survey (USGS) study support the conclusion that there are local but short term effects on both water quality and macroinvertebrate communities in the mining areas. On the Fortymile River, dredges larger than those proposed under this GP showed that turbidity was reduced to background levels within 250 feet. It is expected that small dredges would have even less impact on the downstream receiving water quality."

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The quotes listed in this document were taken word for word out of the documents written by the scholars named above each quote.

This information was compiled with the intent to inform and educate, so the true facts can be a part of the process in the rule/regulation making pertaining to small scale placer mineral/metal mining and prospecting in our rivers and streams.

http://www.akmining....ne/corp9410.htm

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 07:01 AM (MDT)

5. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #4

A GOOD READ ON THE EFFECTS OF SUCTION DREDGING

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State Water Resources Control Board
Division of Water Quality
P.O. Box 100
Sacramento, California 95812-0100
Fax: 916-341-5620
email: commentletters@waterboards.ca.gov
June 6, 2007
Subject: SUCTION DREDGE MINING
~~~~~~~~~~~~~~~~~~

Dear Board Members,

Thank you for allowing me this opportunity to comment on the water quality aspects of small-scale suction dredge mining.

As I have searched the scientific literature for studies on the effects of small-scale suction dredge mining on the environment I have learned that the preponderance of the published research studies have been directed towards assessment of its effect on the biology of the streams and rivers. In nearly every instance the results have concluded that the effects were less than significant.

In water quality terms some studies have discussed turbidity, water temperature, and suspension of heavy metals into the overlying water. I will focus my water quality comments on these three areas. But first I would like to put this issue in to perspective.

GEOGRAPHICAL SCALE OF SMALL-SCALE SUCTION DREDGING

It has been observed that environmentalists opposing suction dredging use data gleaned from reports that studied effects of environmental perturbations that are occurring on a system-wide basis. For example, they would characterize the affects of turbidity from a suction dredge as if it would impact downstream organisms in a manner that system-wide high water flow events might. This approach is entirely inconsistent with the way in which suction dredges operate or generally impact their downstream environment.

The California Department of Fish and Game (1997) described typical dredging activities as follows' "An individual suction dredge operation affects a relatively small portion of a stream or river. A recreational suction dredger (representing 90-percent of all dredgers) may spend a total of four to eight hours per day in the water dredging an area of 1 to 10 square meters. The average number of hours is 5.6 hours per day. The remaining time is spent working on equipment and processing dredged material. The area or length of river or streambed worked by a single suction dredger, as compared to total river length, is relatively small compared to the total available area."

In the Oregon Siskiyou National Forest Dredge Study, Chapter 4, Environmental Consequences, some perspective is given to small-scale mining. "The average claim size is 20 acres. The total acreage of all analyzed claims related to the total acres of watershed is about 0.2 percent. The average stream width reflected in the analysis is about 20 feet or less and the average mining claim is 1320 feet in length. The percentage of land area within riparian zones on the Siskiyou National Forest occupied by mining claims is estimated to be only 0.1 percent." The report goes on to say, "Over the past 10 years, approximately 200 suction dredge operators per season operate on the Siskiyou National Forest" (SNF, 2001).

A report from the U.S. Forest Service, Siskiyou National Forest (Cooley, 1995) answered the frequently asked question, "How much material is moved by annual mining suction dredge activities and how much does this figure compare with the natural movement of such materials by surface erosion and mass movement?" The answer was that suction dredges moved a total of 2,413 cubic yards for the season. Cooley (1995) used the most conservative values and estimated that the Siskiyou National Forest would move 331,000 cubic yards of material each year from natural causes. Compared to the 2413 (in-stream) cubic yards re-located by suction mining operations the movement rate by suction dredge mining would equal about 0.7% of natural rates.

It has been suggested that a single operating suction dredge may not pose a problem but the operation of multiple dredges would produce a cumulative effect that could cause harm to aquatic organisms. However, "No additive effects were detected on the Yuba River from 40 active dredges on a 6.8 mile (11 km) stretch. The area most impacted was from the dredge to about 98 feet (30 meters) downstream, for most turbidity and settleable solids (Harvey, B.C., K. McCleneghan, J.D. Linn, and C.L. Langley, 1982). In another study, "Six small dredges (<6 inch dredge nozzle) on a 1.2 mile (2 km) stretch had no additive effect (Harvey, B.C., 1986). Water quality was typically temporally and spatially restricted to the time and immediate vicinity of the dredge (North, P.A., 1993).

A report on the water quality cumulative effects of placer mining on the Chugach National Forest, Alaska found that, "The results from water quality sampling do not indicate any strong cumulative

effects from multiple placer mining operations within the sampled drainages." "Several suction dredges probably operated simultaneously on the same drainage, but did not affect water quality as evidenced by above and below water sample results. In the recreational mining area of Resurrection Creek, five and six dredges would be operating and not produce any water quality changes (Huber and Blanchet, 1992).

The California Department of Fish and Game stated in its Draft Environmental Impact Report that "Department regulations do not currently limit dredger densities but the activity itself is somewhat self-regulating. Suction dredge operators must space themselves apart from each other to avoid working in the turbidity plume of the next operator working upstream. Suction Dredging requires relatively clear water to successfully harvest gold " (CDFG, 1997).

ELEVATED TURBIDITY AND SUSPENDED

Suction dredging causes less than significant effects to water quality. The impacts include increased turbidity levels caused by re-suspended streambed sediment and pollution caused by spilling of gas and oil used to operate suction dredges (CDFG, 1997).

"Suction dredges, powered by internal combustion engines of various sizes, operate while floating on the surface of streams and rivers. As such, oil and gas may leak or spill onto the water's surface. There have not been any observed or reported cases of harm to plant or wildlife as a result of oil or gas spills associated with suction dredging" (CDFG, 1997).

The impact of turbidities on water quality caused by suction dredging can vary considerably depending on many factors. Factors which appear to influence the degree and impact of turbidity include the amount and type of fines (fine sediment) in the substrate, the size and number of suction dredges relative to stream flow and reach of stream, and background turbidities (CDFG, 1997).

Because of low ambient levels of turbidity on Butte Creek and the North Fork American River, California, Harvey (1986) easily observed increases of 4 to 5 NTU from suction dredging. Turbidity plumes created by suction dredging in Big East Fork Creek were visible in Canyon Creek 403 feet (123 meters) downstream from the dredges (Somer and Hassler, 1992).

In contrast, Thomas (1985), using a dredge with a 2.5-inch diameter nozzle on Gold Creek, Montana, found that suspended sediment levels returned to ambient levels 100 feet below the dredge. Gold Creek is a relatively undisturbed third order stream with flows of 14 cubic feet per second. A turbidity tail from a 5-inch (12.7 cm) dredge on Clear Creek, California was observable for only 200 feet downstream. Water velocity at the site was about 1 foot per second (Lewis, 1962).

Turbidity below a 2.5 inch suction dredge in two Idaho streams was nearly undetectable even though fine sediment, less than 0.5 mm in diameter, made up 13 to 18 percent, by weight, of substrate in the two streams (Griffith and Andrews, 1981).

"During a dredging test carried out by the California Department of Fish and Game on the north fork of American River, it was concluded that turbidity was greatest immediately downstream, returning to ambient levels within 100 feet. Referring to 52 dredges studied, Harvey (1982) stated "...generally rapid recovery to control levels in both turbidity and settable solids occurred below dredging activity."

Hassler (1986) noted "...during dredging, suspended sediment and turbidity were high immediately below the dredge, but diminished rapidly within distance downstream." He measured 20.5 NTU 4 meters below a 5-inch dredge that dropped off to 3.4 NTU 49 meters below the dredge. Turbidity from a 4-inch dredge dropped from 5.6 NTU 4 meters below to 2.9 NTU 49 meters below with 0.9 NTU above. He further noted "...water quality was impacted only during the actual operation of the dredge...since a full day of mining by most Canyon Creek operators included only 2 to 4 hours of dredge running time, water quality was impacted for a short time." Also "...the water quality of Canyon Creek was very good and only affected by suction dredging near the dredge when it was operated."

The US Geological Survey and the Alaska Department of Natural Resources conducted a survey into dredging on Alaska's Fortymile River, which is a river designated as a wild and scenic corridor. The

study stated, "One dredge had a 10-inch diameter intake hose and was working relatively fine sediment on a smooth but fast section of the river. The other dredge had an 8-inch intake and was working coarser sediments in a shallower reach of the river. State regulations require that suction dredges may not increase the turbidity of the river by more than 5 nephelometric turbidity units (NTU), 500 feet (=150m) downstream. In both cases, the dredges were well within compliance with this regulation."

http://www.akmining.com/mine/usgs1.htm

Samples were collected on a grid extending downstream from the dredges as they were operating and compared to measurements made upstream of the dredges. One dredge had a 10-inch diameter intake hose and was working relatively fine sediments on a smooth but fast section of the river. The results of the turbidity survey for the 10-inch dredge are shown on figure 2. Turbidity values behind the 8-inch dredge were lower, because the smaller intake was moving less sediment material, and because the coarser sediments being worked by the 8-inch dredge settled more rapidly

The turbidity values found in the dredge studies fall within the range of turbidity values found for currently mined areas of the Fortymile River and many of its un-mined tributaries. Figure 3 shows the ranges of turbidity values observed along the horizontal axis, and the number of samples that fall within each of those ranges. For example, 25 samples had turbidity between 1.0 and 1.5 NTU, 22 of which were in a dredged area. The highest turbidity value was from an un-mined tributary to Uhler Creek; the lowest from a number of different tributaries to the North Fork. As seen on the figure, there is no appreciable difference in the distribution of turbidity values between mined and un-mined areas.

http://www.akmining.com/mine/usgs1.htm

In American studies, average turbidity levels have been shown to be between 5 and 15 NTU 5 meters below dredges. But even the maximum turbidity level measured in a clay pocket (51 NTU) fell below 10 NTU within 45 meters. Turbidity increases, from even large dredges on moderate sized streams, have shown to be fairly low, usually 25 NTU or less, and to return to background within 30 meters. The impact is localized and short lived; indicating minimum impact on moderate and larger waterways.

Within any waterway, sediment is primarily carried in suspension during periods of rainfall and high flow. This is an important point, as it indicates that a dredging operation has less, or at least no greater effect on sediment mobilization and mobility than a rain storm."

All of these research studies have concluded that only a local significant effect occurs, with it decreasing rapidly downstream. The studies have been wide spread, having been undertaken in Alaska, Idaho, California, Montana and Oregon.

The science supports de minimus status for < 6-inch suction dredges. Turbidity is de minimus according to the U.S. Army Corps of Engineers.

"Effects from elevated levels of turbidity and suspended sediment normally associated with suction dredging as regulated in the past in California appear to be less than significant with regard to impacts to fish and other river resources because of the level of turbidity created and the short distance downstream of a suction dredge where turbidity levels return to normal" (CDFG, 1997).

Furthermore, individuals that have not, in fact, operated suction dredges may not realize that it is a self-limiting operation. The dredge operator must be able to see his work area to operate safely and manage the intake of the dredge nozzle. If high levels of turbidity were to flood the dredger's work area and render him "blind" he would have to move the operation to another location.

INCREASING WATER TEMPERATURE

Responsible suction dredge miners do not dredge stream banks (it is illegal). Dredging occurs only in the wetted perimeter of the stream. Therefore, it is unlikely suction dredging will cause a loss of cover adjacent to the stream.

Solar radiation is the single most important energy source for the heating of streams during

daytime conditions. The loss or removal of riparian vegetation can increase solar radiation input to a stream increasing stream temperature. Suction dredge operations are confined to the existing stream channel and do not affect riparian vegetation or stream shade (SNF, 2001).

Suction dredging could alter pool dimensions through excavation, deposition of tailings, or by triggering adjustments in channel morphology. Excavating pools could substantially increase their depth and increase cool groundwater inflow. This could reduce pool temperature. If pools were excavated to a depth greater than three feet, salmonid pool habitat could be improved. In addition, if excavated pools reduce pool temperatures, they could provide important coldwater habitats for salmonids living in streams with elevated temperatures (SNF, 2001).

Dredge mining had little, if any, impact on water temperature (Hassler, T.J., W.L. Somer and G.R. Stern, 1986). In addition, the Oregon Siskiyou Dredge Study states, "There is no evidence that suction dredging affects stream temperature" (SNF, 2001).

Increases in sediment loading to a stream can result in the stream aggrading causing the width of the stream to increase. This width increase can increase the surface area of the water resulting in higher solar radiation absorption and increased stream temperatures. Suction dredge operations are again confined to the existing stream channel and do not affect stream width (SNF, 2001).

Stream temperature can also increase from increasing the stream's width to depth ratio. The suction dredge operation creates piles in the stream channel as the miner digs down into the streambed. The stream flow may split and flow around the pile decreasing or increasing the wetted surface for a few feet. However, within the stream reach that the miner is working in, the change is so minor that the overall wetted surface area can be assumed to be the same so the total solar radiation absorption remains unchanged. Suction Dredging results in no measurable increase in stream temperature (SNF, 2001).

"Small streams with low flows may be significantly affected by suction dredging, particularly when dredged by larger dredges (Larger than 6 inches) (Stern, 1988). However, the California Department of Fish and Game concluded, "current regulations restrict the maximum nozzle size to 6 inches on most rivers and streams which, in conjunction with riparian habitat protective measures, results in a less than significant impact to channel morphology" (CDFG, 1997).

WATER CHEMISTRY

Concern has been raised that small-scale dredge operations may increase the metal load of the surface waters. Whereas dredge operations do re-suspend the bottom sediment, the magnitude of this disturbance on stream metal loading was unknown. It was unknown what affect the dredge operations may have on the transport and redistribution of metals—some of which (for example, arsenic, copper, and zinc) have environmental importance.

The U.S. Geological Survey and the Alaska Department of Natural Resources cooperated in a project, on Fortymile River, to provide scientific data to address these questions. This river is designated a Wild and Scenic Corridor by the Alaska National Interest Lands Conservation Act. Current users of the river include placer mine operators, as well as boaters and rafters. Along the North Fork Fortymile River, and just below its confluence with the South Fork, mining is limited to a few small suction dredges which, combined, produce as much as a few hundred ounces of gold per year. In this area, some potential environmental concerns have been raised associated with the mining activities, including increased turbidity of the river water; adverse impact on the overall chemical quality of the river water; and potential additions of specific toxic elements, such as arsenic, to the river during mining operations.

Field measurements were made for pH, turbidity, electrical conductivity (a measure of the total dissolved concentrations of mineral salts), and stream discharge for the Fortymile River and many of its tributaries. Samples were collected at the same time for chemical analyses, including trace-metal analyses

Water-quality samples were collected at three points 200 feet behind each of the two operating suction dredges. One sample was collected on either side of the plume, and one in the center of the plume. The samples were passed through a filter with a nominal pore size of 0.45 micrometers and acidified to a pH less than about 2. Results are shown in the following table. Samples 1A, 1C, 2A, and 2C are from either side of the plume behind dredges 1 and 2, respectively. Samples 1B and 2B are from the center of each plume. All concentrations given are in micrograms per liter, except pH, which is

expressed in standard units.

The data show similar water-quality values for samples collected within and on either side of the dredge plumes. Further, the values shown in the table are roughly equal to or lower than the regional average concentrations for each dissolved metal, based on the analyses of 25 samples collected throughout the area. Therefore, suction dredging appears to have no measurable effect on the chemistry of the Fortymile River within this study area. We have observed greater variations in the natural stream chemistry in the region than in the dredge areas (Wanty, R.B., B. Wang, and J. Vohden. 1997).

Side 1 Dredge 1 Side 2 Side 1 Dredge 2 Side 2
1A 1B 1C 2A 2B 2C
pH 7.7 7.6 7.8 7.0 7.5 7.5
Arsenic 0.3 0.3 0.3 0.3 0.3 0.3
Iron 110. 110. 110. 100 97 100
Chromium 2 2 3 3 3 3
Cadmium all less than 0.02 micrograms per liter
Cobalt 0.07 0.07 0.06 0.06 0.05 0.05
Zinc 0.8 0.6 0.8 1.0 1.0 1.0
Lead all less than 0.05 micrograms per liter

A final report from an EPA contract for analysis of the effects on mining in the Fortymile River, Alaska stated, "This report describes the results of our research during 1997 and 1998 into the effects of commercial suction dredging on the water quality, habitat, and biota of the Fortymile River.... The focus of our work on the Fortymile in 1997 was on an 8-inch suction dredge (Site 1), located on the mainstem... At Site 1, dredge operation had no discernable effect on alkalinity, hardness, or specific conductance of water in the Fortymile. Of the factors we measured, the primary effects of suction dredging on water chemistry of the Fortymile River were increased turbidity, total filterable solids, and copper and zinc concentrations downstream of the dredge. These variables returned to upstream levels within 80-160 m downstream of the dredge. The results from this sampling revealed a relatively intense, but localized, decline in water clarity during the time the dredge was operating" (Prussian, A.M., T.V. Royer and G.W. Minshall, 1999).

"The data collected for this study help establish regional background geochemical values for the waters in the Fortymile River system. As seen in the chemical and turbidity data any variations in water quality due to the suction dredging activity fall within the natural variations in water quality" (Prussian, A.M., T.V. Royer and G.W. Minshall, 1999).

REMOVAL OF MERCURY FROM THE ENVIRONMENT

Looking for gold in California streams and rivers is a recreational activity for thousands of state residents. As these miners remove sediments, sands, and gravel from streams and former mine sites to separate out the gold, they are also removing mercury. This mercury is the remnant of millions of pounds of pure mercury that was added to sluice boxes used by historic mining operations between 1850 and 1890. Modern day small-scale gold suction dredgers do not use mercury to recover gold during the operation of the dredge. Therefore, any gold that would be found in their possession would be that which was extracted from the stream or river they are working.

Taking mercury out of streams benefits the environment. Efforts to collect mercury from recreational gold miners in the past, however, have been stymied due to perceived regulatory barriers. Disposal of mercury is normally subject to all regulations applicable to hazardous waste.

In 2000, EPA and California's Division of Toxic Substance Control worked in concert with other State and local agencies to find the regulatory flexibility needed to collect mercury in a simple and effective manner. In August and September, 2000 the first mercury "milk runs" collected 230 pounds of mercury. A Nevada County household waste collection event held in September 2000 collected about 10 pounds of mercury. The total amount of mercury collected was equivalent to the mercury load in 47 years worth of wastewater discharge from the city of Sacramento's sewage treatment plant or the mercury in a million mercury thermometers. This successful pilot program demonstrates how recreational gold miners and government agencies can work together to protect the environment (US EPA, 2001).

Mercury occurs in several different geochemical forms, including elemental mercury, ionic (or oxidized) mercury, and a suite of organic forms, the most important of which is methylmercury. Methylmercury is the form most readily incorporated into biological tissues and is most toxic to humans. The process of mercury removal by suction dredging does not contaminate the environment because small-scale suction dredging removes elemental mercury. Removal of elemental mercury before it can be converted, by bacteria, to methylmercury is a very important component of environmental and human health protection provided as a secondary benefit of suction dredging..

THE REAL ISSUE

The issue of localized conflict with suction dredgers and other outdoor recreational activities can be put into a more reasonable perspective using the data provided at the beginning of this report. For example, the total acreage of all analyzed claims related to the total acres of watershed is about 0.2 percent. The percentage of land area within riparian zones on the Siskiyou National Forest occupied by mining claims is estimated to be only 0.1 percent." The report goes on to say, "Over the past 10 years, approximately 200 suction dredge operators per season operate on the Siskiyou National Forest (SNF, 2001).

The issue against suction dredge operations in the streams of the United States appears to be less an issue of environmental protection and more of an issue of certain organized individuals and groups being unwilling to share the outdoors with others without like interests.

Management of the Fortymile River region (a beautiful, wild and scenic river in the remote part of east-central Alaska) and its resources is complex due to the many diverse land-use options. Small-scale, family-owned gold mining has been active on the Fortymile since the "gold rush" days of the late 1880's. However, in 1980, the Fortymile River and many of its tributaries received Wild and Scenic River status. Because of this status, mining along the river must compete with recreational usage such as rafting, canoeing, and fishing.

A press release from the U. S. Geological Survey stated, in part, the following, "The water quality of the Fortymile River-a beautiful, ...has not been adversely impacted by gold placer mining operations according to an integrated study underway by the U.S. Geological Survey and the Alaska Department of Natural Resources.

Violation of mining discharge regulations would close down the small-scale mining operations. No data existed before this study to establish if the mining was degrading the water quality. However, even with the absence of data, environmental groups were active to close down mining on the river citing unsubstantiated possible discharge violations.

This study has found no violations to date to substantiate closure of the small-scale mining operations. The result is a continuance of a way of life on the last American frontier." (U.S. Geological Survey October 27, 1998). I have no doubt that this is the real issue currently facing small-scale gold suction dredgers in California.

Suction dredges do not add pollution to the aquatic environment. They merely re -suspend and re-locate the bottom materials (overburden) within the river or stream.

I hope this scientific research information I have provided will be helpful in your efforts regarding suction dredge mining and water quality. I thank you for this opportunity to submit this data.

Respectfully Yours,

Joseph C. Greene
Research Biologist, U.S. EPA Retired

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11-16-09, 07:05 AM (MDT)

6. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #5

Economic Impact of Suction Gold Dredging in California is Over $52 Million Per Year
by Scott Harn
Editor/Publisher
ICMJ's Prospecting and Mining Journal

The Surveys
An Environmental Impact Report on suction gold dredging was completed by the State of California in 1994. As part of this process, the State sent out two survey questionnaires. The first questionnaire was sent to over 4,000 individuals. Nearly 2,000 were returned completed. The surveys covered dredge locations, annual spending activity, amount invested in dredging equipment, nozzle size and related questions. The second survey was sent to county Boards of Supervisors, Chambers of Commerce and mining businesses to determine the importance of suction gold dredging on local economies. A sample of 1,257 of the individual surveys was used by the State to complete a statistical analysis.

The Results
"Suction dredging is an activity that requires a substantial investment." It was determined that each suction dredger spent approximately $9,250 per year on expenses related to suction dredging in 1994. This included motels, camp fees, food, gas, oil, equipment maintenance and repairs related to suction dredging. Suction gold dredgers are currently spending approximately $13,249 each per year when adjusted for inflation.

The expenditures cited above did not include the cost of the suction dredge and related equipment, which the survey found was approximately $6,000 in 1994, or $8,594 adjusted for inflation.

In 2008, 3,523 suction gold dredging permits were issued in California. Adjusted for inflation, the economic impact of suction gold dredging in 2008 was $46.68 million. If only one-fifth of permitted suction gold dredgers purchased a dredge during the year, another $6.06 million would have to be added to the above figures, making the total economic impact $52.74 million per year.

Conclusion
Suction dredge miners contribute substantially to the economy of California.

(Note: This estimate does not reflect the value of the recovered gold nor the expenditures of those who may be assisting or accompanying the miner, which could substantially increase the economic impact of suction dredge mining in the State.)

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11-16-09, 07:10 AM (MDT)

7. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #6

CALIFORNIA ADMISSION TO Union
Act for the Admission of California Into the Union
Volume 9
Statutes at Large
Page 452
Whereas, the people of California have presented a constitution and asked admission into the Union, which constitution was submitted to Congress by the President of the United States, by message date February thirteenth, eighteen hundred and fifty, and which, on due examination, is found to be republican in its form of government:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress Assembled, That the State of California shall be one, and is hereby declared to be one, of the United States of America, and admitted into the Union on an equal footing with the original States in all respects whatever.

Sec. 2. And be it further enacted, That until the representatives in Congress shall be apportioned according to an actual enumeration of the inhabitants of the United States, the State of California shall be entitled to two representatives in Congress.

Sec. 3. And be it further enacted, That the said State of California is admitted into the Union upon the express condition that the people of said State, through their legislature or otherwise, shall never interfere with the primary disposal of the public lands within its limits, and shall pass no law and do no act whereby the title of the United States to, and right to dispose of, the same shall be impaired or questioned;

and that they shall never lay any tax or assessment of any description whatsoever upon the public domain of the United States, and in no case shall non-resident proprietors, who are citizens of the United States, be taxed higher than residents;

and that all the navigable waters within the said State shall be common highways, and forever free, as well to the inhabitants of said State as to the citizens of the United States, without any tax, impost, or duty therefor.

Provided, That nothing herein contained shall be construed as recognizing or rejecting the propositions tendered by the people of California as articles of compact in the ordinance adopted by the convention which formed the constitution of that State.
Approved, September 9, 1850.

THIS IS THE IMPORTANT PART
>shall never interfere with the primary disposal of the public lands within its limits, and shall pass no law and do no act whereby the title of the United States to, and right to dispose of, the same shall be impaired or questioned<

The General Mining Law is a land disposal law.

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OLD GOLD MINER
Member since 11-15-09
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11-16-09, 07:14 AM (MDT)

8. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #7

SB 670, unpatented placer mining claims & claim owners valid existing rights

"This Constitution and the laws of the United States which shall be made in pursuance thereof...shall be the supreme law of the land; and the judges in every state shall be bound thereby, anything in the Constitution or laws of any state to the contrary notwithstanding." Supremacy Clause, Article VI U. S. Constitution

"The Congress shall have power to dispose of and make all needful Rules and Regulations respecting...property belonging to the United States.""Property Clause", Article IV, Section 3, U. S. Constitution

California was admitted to the Union, upon the following indefeasible condition:

Sec. 3. And be it further enacted, That the said State of California is admitted into the Union upon the express condition that the people of said State, through their legislature or otherwise, shall never interfere with the primary disposal of the public lands within its limits, and shall pass no law and do no act whereby the title of the United States to, and right to dispose of, the same shall be impaired or questioned;...and that all the navigable waters within the said State shall be common highways, and forever free, as well to the inhabitants of said State as to the citizens of the United States, without any tax, impost, or duty therefor. Act for the Admission of California Into the Union, Volume 9, Statutes at Large, Page 452

The General Mining Law of 1872, is a clear unequivocal federal grant towards disposal of federal

public domain lands, containing valuable minerals, open to such entry. Absolutely guaranteeing the grantee's the right to mine applicable valuable minerals they own, under reasonable regulation.

The legislature of California accepted this express provision in 1850, thus as long as the Federal government retains title, the federal interest in providing free access to its own land in order to promote mining is sufficient to preempt any state law that fundamentally bans such use. Accordingly under standard preemption analysis any state legislation, or subsequent regulation that conflicts with this overriding federal purpose, must fail.

The purpose of the Mining Act is to encourage mining on federal lands. United States v. Weiss, 642 F.2d 296, 299 (9th Cir.1981) (Weiss); see also United States v. Goldfield Deep Mines Co., 644 F.2d 1307, 1309 (9th Cir.1981), cert. denied, 455 U.S. 907, 102 S.Ct. 1252, 71 L.Ed.2d 445 (1982).

Unpatented mining claims are self-initiated rights granted under the General Mining Law. Congress exercised that discretion in granting those rights under the law. (30 U.S.C.A. § 23, 27-28; 43 U.S.C.A. § 1744; Cole v. Ralph, 252 U.S. 286, 296 (1920).)

In ordinary English, a "claim " is merely a demand for something, or an assertion of a right where the right has not been established. The phrase "mining claim" therefore probably connotes to most laymen an unsupported assertion or demand from which no legal rights can be inferred. But that is emphatically not so, as follows;

In law, the word "claim" in connection with the phrase "mining claim" represents a federally recognized right in real property. The Supreme Court has established that a mining "claim" is not a claim in the ordinary sense of the word--a mere assertion of a right--but rather is a property interest, which is itself real property in every sense, and not merely an assertion of a right to property. Benson Mining & Smelting Co. v. Alta Mining & Smelting Co., 145 U.S.428 (1892)

Locators' rights of possession and enjoyment. The locators of all mining locations ... situated on the public domain, their heirs and assigns, ... so long as they comply with the laws of the United States, and with State, territorial, and local regulations not in conflict with the laws of the United States governing their possessory title, shall have the exclusive right of possession and enjoyment of all the surface included within the lines of their locations". (for mining purposes)30 USC § 26.

Once the requirements of the General Mining Law have been met, the right granted by the statute is a real and private property interest. Freese v. United States, 639 F.2d 754, 757, 226 Ct.Cl. 252 cert. denied, 454 U.S. 827, 102 S.Ct. 119, 70 L.Ed.2d 103 (1981); Oil Shale Corp. v. Morton, 370 F.Supp. 108, 124 (D.Colo. 1973).

Valid unpatented mining claims are "property in the fullest sense of that term." (Wilbur v. United States ex rel. Krushnic, 280 U.S. 306, 316 (1930).) Which entitles the owner "the right to extract all minerals from the claim without paying royalties to the United States." Swanson v. Babbitt, 3 F.3d 1348. Further entitling the holder to "the right to a flow of income from production of the claim." (United States v. Locke, 471 U.S. 84, 104 - 105 (1985).)

Even though title to the fee estate remains in the United States, these unpatented mining claims are themselves property protected by the Fifth Amendment against uncompensated takings. See Best v. Humboldt Placer Mining Co., 371 U.S. 334 (1963); cf. Forbes v. Gracey, 94 U.S. 762, 766 (1876); U.S.C. A.Const. Amend. 5; North American Transportation & Trading Co. v. U.S., 1918, 53 Ct.Cl. 424, affirmed 40 S.Ct. 518, 253 U.S. 330; United States v. Locke, 471 U.S. 84, 107, 105 S.Ct. 1785, 1799, 85 L.Ed. 2d 64 (1985); Freese v. United States, 639 F.2d 754, 757, 226 Ct.Cl. 252, cert. denied, 454 U.S. 827, 102 S. Ct. 119, 70 L.Ed. 2d 103 (1981); Rybachek v. United States, 23 Cl.Ct. 222 (1991).

Prospecting, locating and developing of mineral resources in the national forests may not be prohibited nor so unreasonably circumscribed as to amount to a prohibition. Weiss, 642 F.2d at 299,United States Court of Appeals, Ninth Circuit,(1980).

California law recognizes water rights by ownership of riparian land, appropriation, or prescription. Cal. Water Code § 2501. In re Water of Hallett Creek Stream Sys., 749 P.2d 324 (Cal. 1988), cert. denied sub nom. California v. United States, 488 U.S. 824 (1988). The California Supreme Court ruled that

the federal government, as owner of nearly half the land in the state, held riparian water rights on the lands it set aside for particular federal purposes, but that the extent of rights were determined with reference to the interests of other water users. Id. at 327.

National forests "...are not parks set aside for nonuse, but have been established for economic reasons". 30 Cong.Rec. 966 (1897) (Cong. McRae)." United States v. New Mexico, 438 U.S. 696, 708, 98 S.Ct. 3012, 3018, 57 L.Ed.2d 1052 (1978).

Even the Forest Service is limited in the amount of regulation it may impose as a condition of mining in national forests because of the federal policy to encourage mining on federal lands. See Weiss, 642 F.2d at 299; see also 30 U.S.C. Sec. 21a; 36 C.F.R. Sec. 228.5(a).

To allow a second tier of permit authority to be exercised by the states would undermine the Forest Service's ability to keep the applicable environmental requirements within the range of reasonableness. See Weiss, 642 F.2d at 299; 36 C.F.R. Sec. 228.5(a). Current federal law allows the states to establish environmental standards that the Forest Service will apply in exercising its permit authority. See id. Sec. 228.8. But by reserving final permit authority in the Forest Service, see id. Secs. 228.4-.5, it also affords the Forest Service the power necessary to promote the federal purpose of maintaining the reasonableness of the overall regulatory mix. See 30 U.S.C. Sec. 21a; 36 C.F.R. Sec. 228.5(a).

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11-16-09, 07:33 AM (MDT)

9. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #8

Title 14. California Code of Regulations
Chapter 3. Guidelines for Implementation of the California Environmental Quality Act
Article 19. Categorical Exemptions

15300. Categorical Exemptions
Section 21084 of the Public Resources Code requires these Guidelines to include a list of classes of projects which have been determined not to have a significant effect on the environment and which shall, therefore, be exempt from the provisions of CEQA. In response to that mandate, the Secretary for Resources has found that the following classes of projects listed in this article do not have a significant effect on the environment, and they are declared to be categorically exempt from the requirement for the preparation of environmental documents. Note: Authority cited: Section 21083, Public Resources Code; Reference: Section 21084, Public Resources Code.

15300.1. Relation to Ministerial Projects
Section 21080 of the Public Resources Code exempts from the application of CEQA those projects over which public agencies exercise only ministerial authority. Since ministerial projects are already exempt, categorical exemptions should be applied only where a project is not ministerial under a public agency's statutes and ordinances.

CA DF&G themselves held that issuance of a dredging permits, is MINISTERIAL

15304. Minor Alterations to Land
Class 4 consists of minor public or private alterations in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees except for forestry or agricultural purposes.

Suction dredge fits inside this exemption.

15330. Minor Actions to Prevent, Minimize, Stabilize, Mitigate or Eliminate the Release or Threat of Release of Hazardous Waste or Hazardous Substances.
Class 30 consists of any minor cleanup actions taken to prevent, minimize, stabilize, mitigate, or eliminate the release or threat of release of a hazardous waste or substance which are small or

medium removal actions costing $1 million or less.

Suction dredging fits here also, as it certainly removes toxic mercury & lead

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 07:35 AM (MDT)

10. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #9

Owners of valid unpatented placer claims under 30 USC 21-54, hold a statutory "grant" from the federal government, to mine federally authorized mining claims, subject to existing federal regulations at 36 CFR 228 et. seq., & 43 CFR 3809 et. seq.

Certainly, the state may also regulate that use. But, state regulation cannot be unreasonable, nor so onerous as to effect a total prohibition of mining, or prohibit any standardized mining methods, such as suction dredging. To hold otherwise arbitrarily obliterates what a valid "mining claim" is, the owners private property rights, and federal law providing for their existence, and use.

The basic authority for Forest Service management of the surface resources on mining claims is 16 U.S. C. 551, which provides: The Secretary of Agriculture . . . may make such rules and regulations and establish such service as will insure the objects of such reservations, namely, to regulate their occupancy and use and to preserve the forests thereon from destruction . . . . There is a statutory right for persons to prospect and mine on National Forest System land open to mineral exploration, but such persons must comply with the rules and regulations covering the National Forests (16 U.S.C. 478). The relevant regulations are primarily set forth in 36 CFR Part 228, Subpart A, et. seq.

The regulations at 36 CFR Part 228, Subpart A shall be administered in a fair, reasonable, and consistent manner and not as a means of inhibiting or interfering with legitimate, well-planned mineral operations. The regulations at 36 CFR Part 228, Subpart A apply to all unpatented mill sites, tunnel sites, and mining claims, including those not subject to 30 U.S.C. 612, and to activities, primarily prospecting, which may be conducted under the mining laws but not on claims.

The statutory right of the public to prospect, develop, and mine valuable minerals shall be fully honored and protected. Onsite disturbance would be considered significant if natural recovery, to a condition of no higher standard than existed before the operation, would not be expected to take place within a reasonable period of time The determination of what is significant can come only from a fair, reasonable, and consistent evaluation of proposed operations on a case-by-case basis. .

These regulations do not allow the Forest Service or BLM to deny entry or preempt the miners' statutory right granted under the 1872 Mining Law.

Given that fact, clearly, any state law, such as SB 670 cannot prohibit mining via suction dredging on a valid federally protected unpatented placer claim.

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OLD GOLD MINER
Member since 11-15-09
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11-16-09, 07:36 AM (MDT)

11. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #10

Overview of small-scale suction dredging, applicable law & associated property rights.

Gold is found in drainages as alluvial placers where the gold is concentrated in present stream or river channels. To form placer deposits, gold is eroded from its host rock upslope, and upstream and carried downstream by the action of the water. The particles range in size from "flour" gold, to small flakes, wheat or rice grain sized nuggets, and much larger nuggets, sometimes weighing an ounce, or more.

The distance gold particles move depends on the size and shape of the particle and on the energy of the stream. Gold is picked up where currents are fast and deposited when stream velocity slows. One typical area where stream velocity decreases is where the stream enters a pool. Other areas include the inside curve of bends, where the flow is slower than in the main channel and outside bend. Water also slows in eddies on the downstream sides of obstructions in the stream, such as rocks, vegetation, logs, or bedrock outcrops.

As one of the densest materials transported by any stream velocity, gold is among the first to drop out when a stream slows and energy diminishes. Unless the gold is picked up again, it often sifts down to a hardpan layer or to bedrock by the action of gravity. Miners have long recognized how and where gold is likely to be concentrated and have operated accordingly.

All gold bearing streams in California were historically placer mined to various degree's, and many continue to give up gold to miners today. Placer gold is normally recovered by miners who use small-scale suction dredges, primarily on unpatented placer mining claims, they own, lease or have permission to dredge on.

Unpatented placer claims on public domain lands, open to mineral entry (some - not all National Forests & BLM lands) are initiated, and held by mining claimants under the General Mining Laws (30 U.S.C. § 21-54). Corresponding regulations to protect the environment from undue, or unnecessary degradation that may be caused by mining are found at 36 CFR 228 et. seq., & 43 CFR 3809 et. Seq.

These federal mining regulations are lengthy, complex, and stringent. Federal law mandates these regulations shall be administered in a fair, reasonable, and consistent manner and not as a means of inhibiting or interfering with legitimate, well-planned mineral operations. These regulations do not allow the Forest Service or BLM to deny entry or preempt valid mining claim owners statutory rights, or private property interests granted under the General Mining Laws.

Dredges typically use gasoline-powered pumps to create suction in a flexible pipe, generally up to 5 inches in diameter. The suction pulls stream sediment, gravel, small rocks, and other overburden materials from the stream bottom, along with any gold. All this material is routed through the header box and onto a sluice box.

The sluice box channels the water and other material over a series of riffles that serve to create pockets of slow water immediately behind each riffle - the heavier material, including any gold, settles behind the riffles and the rest ejects directly back into the stream. The entire system (e.g., gasoline-powered engine, pump, and sluice box) is mounted on a floating platform that is anchored or tethered near the work area.

Operators try to open, and maintain a hole open down to bedrock in which to work. As the operator advances upstream, cobbles and rocks too large to be vacuumed up through the nozzle and suction hose are pried loose and placed to the edge or back of the hole while smaller material is pumped through the sluice box and - except for gold and other heavy materials, such as lead sinkers, mercury that may settle out behind riffles - is immediately discharged out of the sluice box and back into the stream.

Some dredges are equipped with air compressors that provide air to "divers" so they can remain under

water while examining and suction-dredging deeper holes. In extreme cold water, some dredges are even equipped with water heating devices, that recirculate warm water through a divers wet suit, to ward off hypothermia, in extreme cold water conditions. A rule of thumb is that up to one foot of overburden can be worked economically for each inch of dredge-hose-nozzle diameter.

Small-scale suction dredge operators generally prospect or explore and mine only a relatively short distance each mining season, from less than 10 feet of stream up to a maximum of perhaps 200 feet. Significant lengths of almost all gold bearing drainages in California have experienced some form of past placer mining.

Suction dredge operators search for areas that were overlooked or avoided by past miners. Many suction dredge operators have found gold in previously mined areas by meticulously exploring cracks and crevices in bedrock. The amount of material worked by small-scale suction dredgers varies widely, from less than a cubic yard per day up to 5 or possibly more yards per day, dependent on overburden characteristics, and dredge nozzle size.

In areas of large substrate, more time and effort is spent by the operator moving small boulders and cobbles larger than the nozzle diameter out of the work area. Consequently, in larger substrate less material is processed through the dredge. The opposite is true for dredging in substrate that is predominantly smaller than the dredge nozzle diameter.

Miners typically move their dredges into the stream at the beginning of the their endeavor, and do not remove their dredge until the last day of operations. There is not repeated loading or unloading of the dredges. Some miners, only dredge during week ends, holidays, or vacation periods. Others, dredge more often, to supplement other income sources. Some dredge full time, as their primary livelihood, and sole source of income.

While suction dredge is often described as a "hobby", or "recreational". In the vast majority of instances, primarily where miners own unpatented mining claims, that is emphatically not so. Initiation of a valid placer claim is, to say the least a difficult, often a lengthy, time consuming, expensive process. In-so-far as, almost every inch of all open to entry placer gold bearing, streams, creeks, or rivers in California are already covered with one of the 25,000 pre-existing active unpatented mining claims in California.

The investment to find, initiate, acquire, or purchase a productive unpatented placer claim, as well as a suction dredge, trailer to haul it, and all other gear required to profitably suction dredge can run from as little as $3,000, to as much as $50,000. Because valid unpatented placer mining claims, are in fact, "real property", they are subject to California property tax, as well as annual BLM maintenance fee's. Which, if not perfectly maintained, subject any unpatented mining claim to forfeiture, by operation of federal law.

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 07:42 AM (MDT)

12. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #11

In ordinary English, a "claim " is merely a demand for something, or an assertion of a right where the right has not been established. The phrase "mining claim" therefore probably connotes to most laymen an unsupported assertion or demand from which no legal rights can be inferred. But that is emphatically not so. In law, the word "claim" in connection with the phrase "mining claim" represents a federally recognized right in real property. The Supreme Court has established that a mining "claim" is not a claim in the ordinary sense of the word--a mere assertion of a right--but rather is a property interest, which is itself real property in every sense, and not merely an assertion of a right to property. Benson Mining & Smelting Co. v. Alta Mining & Smelting Co., 145 U.S.428 (1892)

Even though title to the fee estate remains in the United States, these unpatented mining claims are themselves property protected by the Fifth Amendment against uncompensated takings. See Best v. Humboldt Placer Mining Co., 371 U.S. 334 (1963); cf. Forbes v. Gracey, 94 U.S. 762, 766 (1876); U.S.C. A.Const. Amend. 5; North American Transportation & Trading Co. v. U.S., 1918, 53 Ct.Cl. 424, affirmed 40 S.Ct. 518, 253 U.S. 330; United States v. Locke, 471 U.S. 84, 107, 105 S.Ct. 1785, 1799, 85 L.Ed. 2d 64 (1985); Freese v. United States, 639 F.2d 754, 757, 226 Ct.Cl. 252, cert. denied, 454 U.S. 827, 102 S. Ct. 119, 70 L.Ed. 2d 103 (1981); Rybachek v. United States, 23 Cl.Ct. 222 (1991).

The taxability of unpatented mining claims was established more than a century ago by the California Supreme Court, in the case of the State of California v. Moore 12 Cal. 56 (1859), which stated in part: "The interest of the occupant of a mining claim is property, and, under the Constitution, it is in the power of the Legislature to tax such property."

Section 104(b) of the California Revenue and Taxation Code defines real property in part as "All mines, minerals, and quarries in the land, and all rights and privileges appertaining thereto." The term "land" is defined in Property Tax Rule 121 in relevant part as "the possession of, claim to, ownership of, or right to possession of land; mines, quarries, and unextracted mineral products. All real property not exempt or immune from taxation is subject to property tax.

The terms "mineral rights" and "mining rights" as described in Section 607.5 include the right to enter in or upon the land for the exploration, development, and production of minerals including oil, gas, and other hydrocarbons.

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 07:52 AM (MDT)

13. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #12

Clearly, owners of valid unpatented placer mining claims have both a federal statutory grant, as well as correlative riparian ownership of a share of the water naturally flowing through their mineral estate. Which permits them to put that water to beneficial use for mining purposes. Suction dredging to recover placer gold concentrated in river, or streambed auriferous gravels is plainly a beneficial use of water.

Beneficial use of free flowing water through a valid placer mining claim requires no permits or licenses, so long as the water use is reasonable, not significantly impounded, diverted away, or wasted. The right to use that water is a property right and can be protected against infringement in the same manner as any other property right; i.e., by appropriate court action.

Existing water law, historical use, and practice, as well as common sense provide that with any beneficial use of water, that use may degrade the quality of the water so used. Otherwise, any use of water would be impractical. As all consumption, irrigation, agricultural, municipal, or industrial use of water, most certainly involves a relative degree of degradation to that waters quality. If otherwise, the simple act of washing dishes, or clothing, watering your lawn, bathing, or flushing a toilet, would be unlawful.

Furthermore an individual grantee, or owner of a "beneficial use" of water flowing through his own property, or mineral estate requires no Endangered Species Act (ESA) "incidental take" permit. To take

is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." 16 U.S.C. § 1532. " Incidental take" means the action involved is incidental to, and not the purpose of, an otherwise lawful activity. "harm" is defined as "an act which actually kills or injures wildlife." 50 C.F.R. § 17.3.

If an ESA "take" permit, incidental or otherwise were required for beneficial water use. Every person, or family using water from any watershed, or drainage in California containing ESA listed fish, would be required to have such a permit, as their use certainly degrades water put to that use. Ponder also that, 3 million California sports fisherman require no ESA "take" permit, yet their sole purpose is to capture, and kill fish.

Proponents of SB 670 argue that suction dredge gold mining in California *harms* ESA listed fish, and their corresponding habitat. Because ESA regulation further explains that "such act may include significant habitat modification where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering."

Obviously, suction dredge gold mining in California water affects both water quality, and ESA listed fish habitat. Just, as all other beneficial water uses do, in one way or another. The California legislature, and SB 670 proponents ignore under pre-SB 670 dredging regulation, all suction dredge gold mining was clearly prohibited in all places, and at all times when and where suction dredging could have possible deleterious effects on salmon, their spawning habitat, and throughout times when eggs, or egg sack fry are maturing in spawning gravels.

Secondly, a large body of authoritative peer reviewed scientific studies of well regulated suction dredging gold mining with dredge orifices under six inches, individual, or cumulative effects are so minimal, negligible, fleeting that they are De Minimis, meaning unworthy of serious legal consideration, or consequence.

The state of California holds all water under the Public Trust Doctrine. Thus, all people can use water naturally flowing through federal public domain lands, such as national forests for drinking, cooking, bathing, swimming, rafting, boating, sports fishing, etc. However, those water uses are "implied" rights of use.

Whereas, the framers of SB 670, and the California legislature ignore, valid unpatented placer claim owners, have 1st; an express statutory grant, 2nd; riparian water rights & 3rd; a vested private property right to put that same free flowing water to beneficial use for mining purposes. Which gives all valid placer claim owners in California a higher priority, corresponding private property rights, and a protected legal interest far above all other incidental users of free flowing water within national forests, and/or BLM lands.

To emphasize that fact, all federal preservation type land withdrawals, such as the Wilderness Act, National Recreation Area Act, the Wild & Scenic Rivers Act, Federal Land Management Policy Act, ad infinitum, contain express provisions, that each, and every land withdrawal so made under their auspices, is subject to "Valid Existing Rights".

Which absolutely includes water use, and mining rights pertinent to valid preexisting unpatented mining claims situated within such land withdrawals. To do otherwise would abridge Constitutional protections for "taking" private property, without just compensation first being paid to such owners.

Given these unequivocal facts, SB 670 provisions indefinitely prohibiting suction dredge gold mining in California is an unconscionable, unfair, discriminatory, prohibitive, unfounded law, that any competent federal court will swiftly overturn.

OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 07:53 AM (MDT)

14. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #13

Public Scoping Meeting for input on possible changes to DFG's Suction Dredge Program
5:00 p.m.
November 17, 2009
City of West Sacramento Galleria
1110 West Capitol Ave.
West Sacramento, CA 95691

Public Scoping Meeting for input on possible changes to DFG's Suction Dredge Program
5:00 pm
November 18, 2009
Shasta Senior Nutrition Program Center
100 Mercy Oaks Drive
Redding, CA 96003

Public Scoping Meeting for input on possible changes to DFG's Suction Dredge Program
5:00 p.m. November 16, 2009
California Retired Teachers Association Building
3930 E. Saginaw Way
Fresno, CA 93726

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 07:55 AM (MDT)

15. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #14

CA DF&G CODE
5653. (a) The use of any vacuum or suction dredge equipment by any person in any river, stream, or lake of this state is prohibited, except as authorized under a permit issued to that person by the department in compliance with the regulations adopted pursuant to Section 5653.9.

The word "person" would seem to be all inclusive, unless otherwise provided for by statute, and subsequent regulation derived from that statute.

Which, in the case CA DF&G is specifically as follows:

5653.8. For purposes of Sections 5653 and 5653.3, "person" does not include a partnership, corporation, or other type of association.

Valid unpatented placer mining claim owners act in "association" with Federal Mining Law. Accepting that federal "grant" to explore for, find, initiate ownership of, and mine at their own risk, and expense applicable valuable minerals situated on or within federal lands, open to such mineral entry. In fact, any valid unpatented placer mining claim is made in "partnership" with the federal government, under grant provided for within the Federal Mining Laws, 30 U.S.C. § 21-54.

In any instance where more than one person, acting in "association" with another person, or more than one other person, to dredge on a federal unpatented placer mining claim is a "partnership". Any valid unpatented placer mining claim owned by more than one individual is a form of "partnership" amongst all co-owners.

In fact, any valid placer claim, with more than 1 locator, or over 20 acres in size, requiring more than one locator is an "association" placer claim, as provided for by both federal, and state law. Furthermore, valid unpatented placer claims may be owned by "corporations".

Which, is all inclusive, as every valid unpatented placer mining claim in California, is initiated, and held in partnership, and association with governing federal law.

Thus, by California's own explicit statutory restriction, direct provision, and unambiguous regulation, CA DF&G has no implied, nor express authority to govern, or regulate suction dredge use on valid unpatented placer mining claims, situated on federal public domain lands. Particularly, where partnerships, associations, or corporations dredge on those mining claims. So long as those operators act in full compliance with governing federal law, and regulation.

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 07:58 AM (MDT)

16. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #15

What becomes plain to anyone knowledgeable in the area of federal lands, and mining law, in reading, and trying to respond to this initial study report.
Is that DFG themselves & the company that they contracted to compile, and perform the EIR, lack a basic understanding of fundamental law, and facts governing federal public domain & mining on it.

FACT 1.
The vast majority of all suction dredge gold mining in California takes place on federal public domain lands.

FACT 2.
The vast majority of those same federal lands, are open to mineral entry under federal mining laws & where gold exists are held under mining claims.

FACT 3.
Mining on federal lands, is encouraged by federal policy directive & governed by federal law & regulation.

FACT 4.
Once a valid mining claim is established, it grants the owner various protected private property rights.

FACT 5. State law, and regulation cannot prohibit what federal law encourages, and allows.

What we have here is a state agency who's primary responsibility is to regulate California's fish & game as follows:

CA F&G CODE Section 200
200. There is hereby delegated to the commission the power to regulate the taking or possession of birds, mammals, fish, amphibia, and reptiles to the extent and in the manner prescribed in this article.

201. Nothing in this article confers upon the commission any power to regulate any natural resources or commercial or other activity connected therewith, except as specifically provided.

For reasons only the California legislature can explain, they allocated CA DF&G authority to regulate the issuance of small scale suction dredge mining permits.

CA DF&G Section 201 provisions creates a conundrum, because valuable minerals are a "natural resource", and mining is both "commercial" & "activity" connected to it.

Regardless of the obvious conflict there, because the California legislature specifically provided CA DF&G

with authority to regulate the issuance of mining permits, the public, and mining claim owners in California are forced to comply with it.

In the last decade approximately 3,200 suction dredge mining permits were issued in California by CA DF&G annually, under existing regulations that were comprehensive, relatively fair, and workable by all involved.

In the interim, a series of law suits were brought, primarily instigated by the Karuk indian tribe of California to protect what they assert to be their indigenous salmon fishery. Ignoring the fact, they have no reservation, nor protected fishing rights, over that of any other California citizen.

In one litigation, a state court ordered a CEQA study for the Klamath, Scott & Salmon rivers. In another, the state court ordered CA DF&G to halt the issuance of suction dredge permits, until CA DF&G complied with a mix of the two court orders. CA DF&G did not comply, under the premise issuing those permits is "ministerial, giving then no discretion to do otherwise.

Given the obvious conundrum there, the issue is then further complicated by the California legislature, without an Attorney Generals legal opinion, whether or not SB 670 is legal. The legislature pass's SB 670, which prohibits all suction dredging state wide until both state court orders are complied with, a state wide CEQA study is performed, and any new suction dredging regulations, if needed, are implemented.

In so far as the right to mine, on federal lands, on unpatented mining claims, is a federally protected private property right. Public Lands for People, et., al., immediately filed a lawsuit against the state of California, against numerous unlawful provisions of SB 670.

In the same span of time, CA DF&G spends $1.5 million dollars hiring a ""water quality"" evaluation firm, to commence the state wide CEQA study. The firm presents CA DF&G with an "Initial Study" report that is fundamentally flawed, because neither CA DF&G or the firm have expertise, nor experience with federal land law, federal mining law, and associated private property rights conferred to owners of unpatented mining claims, where the vast majority of suction dredge gold mining takes place in California.

Furthermore, public meetings are scheduled by mandate of the California Administrative Procedures Act, in Fresno on the 16th, Sacramento on the 17th, Redding Ca., on the 18th of November. Where the public may submit "comments" . On, or before November 24th, the California state Attorney Generals Office (AG) will submit its answer to the federal lawsuit against the illegal provisions of SB 670.

Depending on admissions, or denials in that AG answer, it is possible the court may issue an injunction, halting any or all aspects of the process, until the matter is decided on the merits of briefs alone. Or, possibly the federal court process plays out in a trial, leaving a jury to decide the matter.

Here we have a California Indian tribe, without any protected fishing rights, suing to protect, the rights they don't have.

Sport fishing associations supporting the Indian tribes litigation to protect fish, so they can catch, and kill them.

The state courts fumbling the matter, ignoring the private property rights, unpatented mining claim owners do have.

The CA DF&G doing flip flips whether or not the issuance of suction dredge permits is "ministerial" or not. Meaning, they either have no discretion, and must issue them, or discretion to not issue them.

The legislature finding SB 670 has no or negligible economic impact. When in fact the economic impact toll may reach $100 million dollars annually.

The legislature passing SB 670, premised on "findings" that will be made at some future date, which is laughable.

The legislature passing SB 670, as emergency legislation, where no emergency exists, which is unconscionable.

A state agency that does in fact regulate mining, which exempts permitting on mining of less than 1000 yards of material, on less that one acre.
Which pales in comparison to what suction dredging can do on any one site.

Public hearings going on, the results of which will certainly effect the private property rights of as many as 60,000 individual owners of unpatented mining claims in California, without any notice to them.

A state agency that has very little expertise in what it regulates, hiring a private firm, that clearly has no expertise in much of what it is being paid $1.5 million dollars to do.

A "temporary" ban on all suction dredge gold mining in California, that is "indefinite".

Private property being illegally taken, without just compensation being paid.
Not from one, but thousands of mining claim owners.

All in all here, we have an ever expanding comedy of bureaucratic bumbling.
The end of which is not yet in sight.
Apparently, this is a perfect example of California "governance" at it's finest.

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 08:00 AM (MDT)

17. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #16

CDFG has no statutory authority over "mineral resources' within California.
No one can rationally refute that 'mining claims" involve 'mineral resources", and their extraction.
No one can credibly refute the majority of all suction dredge gold mining in California takes place on mining claims.

The protection of mineral resources in California is the responsibility of the following agencies.
Which either have statutory authority or are Responsible Agencies under CEQA:

1. California Department of Conservation is the primary agency with regard to mineral resource protection.
The Department is charged with conserving earth resources (Public Resources Code Sections 600-690)

2. State Mining and Geology Board, which develops policy direction regarding the development and conservation of mineral resources and reclamation of mined lands.

CDFG lacks statutory authority over California's "mineral resources".
Which negates their ability to make rulings governing, permitting, or prohibiting their extraction.

Furthermore, the site, or legal description of a CEQA project must be accurately identified within an EIR.

Given, this EIR is "statewide".

It is therefore incumbent on the lead agency to identify with certain specificity each individual site, all individual property, including each unpatented mining claim it may effect or involve with the EIR.

A CEQA project cannot be a "one size fits all" within an EIR.
Plainly, the environment of one individual site, will differ significantly from all others.
Consequently, what may be a significant impact at one site, may be of no or negligible impact in another.
Any purported CEQA study that utilizes a "one size fits all" methodology is therefore fundamentally flawed.

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 08:01 AM (MDT)

18. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #17

Public Resources Code, Section 21002.1 (a) states that:

"The purpose of an environmental impact report is to identify the significant effects of a project on the environment, to identify alternatives to the project, and to indicate the manner in which those significant effects can be mitigated or avoided."

If potential environmental impacts are identified, the agency is then required to analyze what is necessary to mitigate them and/or select feasible alternatives.

With regard to "suction dredge gold mining", within unpatented mining claims, there are no feasible "alternatives", other than seasonal , or permanent closures. Either of which, would effect regulatory "takings" of private property interests held by all affected unpatented mining claim owners.

Any seasonal restriction that closes a given area (where unpatented mining claim are situated), for example ten (10) months of the year, "takes" the owners property right for that ten (10) month period, effecting an annual "temporary" "taking" of very significant duration.

Temporary "takings" of private property of this nature would generally be considered "compensable", as they "take" all economic benefit for a significant period of time.

Permanent closures of any area where an unpatented mining claim is situated, would effect a complete "taking" of all economic benefit a mining claim owner has. As he owns nothing more than the right to mine his property.

Generally, "economic impacts" need not be included within a "CEQA" study. As economic impacts are not potential, or actual physical changes to the environment. Here however, when temporary, or permanent closures of given area's are utilized to "mitigate" or "avoid" significant effects to the environment attributed to suction dredging, economic impact is relevant to measure the significance of an environmental impact.

The U.S. Supreme Court has unequivocally determined "unpatented mining claims" are private property, subject to Constitutional protection from "taking", without compensation. Given that fact, this CEQA study must include an economic analysis, on its effects, as they pertain to "suction dredge gold mining" on mining claims. In-so-far as this CEQA study result take's" hundreds of millions, if not a billions of dollars in compensable private property rights belonging to affected mining claim owners.

Considering the magnitude of dollar amounts involved, of compensable 'taking" implications of this specific CEQA study, as they pertain to affected mining claims state wide. When dollar amounts are used as a measure, compared to near negligible, negligible, direct, or cumulative environmental effects. Anyone with the ability to perform simple subtraction, when one value is subtracted from the other, clearly proves suction dredge gold mining environmental effects are De Minimis.

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 08:02 AM (MDT)

19. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #18

Well thought out, and carefully crafted legislation results in sound law, and subsequent regulations that are rarely ever challenged, and almost never overturned. Simply because they are meticulously legal in all aspects, from the very start. If, or when judicial review of well founded law, or regulation is initiated, judges generally have an simple task in finding the facts of the matter, governing law, and making correct expeditious judgment.

Profoundly, SB 670 is not such legislation, nor are the regulations resulting from it. In fact, the premise behind SB 670, its "findings", and need to be passed as an "urgency" measure are all fundamentally flawed. Hence, all provisions, and resulting regulations of SB 670, once in effect were immediately challenged as being contrary to, and/or abrogating a very extensive list of governing constitutional, federal, and state laws.

At the forefront of that federal court legal challenge, in-so-far as historically suction dredge gold mining is a completely legal business occupation. That sadly matters not, as 670 immediately prohibited all suction dredge gold mining, state wide for an unascertainable indefinite period of time, based on multiple court ordered CDFG, CEQA and APA governed contingencies that, any one of which, several, or all may never actually occur.

CDFG has began the process, but it face numerous uncertainties. The first of which is, if the federal court challenge of SB 670 results in the court expeditiously granting immediate injunctive relief to the plaintiffs, of one sort, or another. Which has profound merit, in that SB 670 prohibitions capriciously caused, and will continue to cause thousands of affected parties, and mining claim owners in California unjustifiable hardship, loss of occupation, livelihood, income, and constitutionally protected private property rights. As an effected party, at times, it is difficult to remain civil when expressing my thoughts about the matter.

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 08:03 AM (MDT)

20. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #19

The reality here is that the sporadic operation of one single small scale suction dredge in all of California's waterways, would almost certainly not trigger CEQA.
Here, via legislation, the issuance of 3,200 small scale suction dredge permits has.
Simply because, whether well founded, justified or not, the legislature, and Governor made it so.

Consequently, it is the cumulative impact of 3,200 suction dredge sporadic seasonal operations scattered state wide that must be determined.
Rather than the impact of one, in one specific place.
How can it be possible, without performing 3,200 CEQA studies of suction dredges operating where, and when they previously could.
Given that each place where small scale suction dredges operate has differing site specific environmental factors.

As a very brief example, for instance:

1. Some waterways have consistent high volume water flow rates, some do not.

2. Some waterways contain relatively cold water, while others are relatively warm.

3. Some waterways have high natural turbidly, some do not.

4. Some waterways are polluted with all sorts of noxious waste, some are not.

5. Some waterways are perennial, some are not.

6. Some waterways contain ESA listed fish, others do not.

7. Some waterways are relatively scenic, or pristine, others are not.

8. Some waterways see a high amount of recreational use, others do not.

9. Some waterways have course substrates, others do not.

10. Some waterways are heavily forested, others are not.

11. Some waterways are heavily fished, others are not.

12. Some waterways contain appreciable mercury, others do not.

That is just a few of the thousands of site specific differences that could be listed.

Given the magnitude of site specific environmental differences.
Which are widely dispersed over more than 100 million square acres.
Which contain more than 211,500 miles of streams, rivers, and waterways of every sort.
Any one of which may be susceptible to seasonal, or sporadic suction dredge gold mining by any number of differing sized, or horse power range suction dredges.

Regardless of size or horsepower, it is apparent there would be only one single suction dredge per 31,250 square acres.
Or about one suction dredge operating per 70 waterway miles in California.
Certainly, some area's are prone to higher suction dredge concentrations, than others.
Never the less, suction dredging is sporadic, seasonal, performed weather permitting, widely dispersed, and the effects are so fleeting.
It is extremely difficult, and often impossible to identify suction dredge sites the following year.

By law, CEQA studies are site specific.
If not, for instance one CEQA study covering any individual building construction site, would fit all others state wide.
Which, is not the case, nor allowed by CEQA.
How then is it legally possible that the California legislature can mandate CDFG perform a statewide CEQA study.
To cover literally millions of potential individual suction dredge gold mining sites.
All of which differ, then draw conclusions supportable by clear substantiation, material fact, a preponderance of evidence, or even fair argument.

CEQA mandates, "one shoe does not fit all", yet CDFG attempts it here

OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 08:05 AM (MDT)

21. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #20

A CEQA process is neither legitimate, or legal.
If the property owners are not given timely legal "notice" of the "project", involving their property.

Two of the basic purposes of CEQA are to inform governmental decision-makers and the public about the potential significant effects, if any, of a proposed project and to provide opportunities for other agencies and the public to review and comment on draft environmental documents. The latter is crucial to the effectiveness of the former.

Depending upon the characteristics of a project and its potential for significant environmental effects, CEQA review may pursue one of three basic directions: (1) an exemption (statutory or categorical); (2) a negative declaration (including a mitigated negative declaration); or (3) an environmental impact report (EIR). Requirements for review, comment, and notice vary according to the complexity of the environmental review.

The state of California by passage of SB 670 mandated the issuance of small scale suction dredge gold mining permits is a "project" subject to CEQA requirements. In doing so, the state of California automatically made all active suction dredge gold mining permit holders "proponents" of this CEQA "project".

SB 670 provisions also placed all patented, and unpatented mining claim owners in California, who at any time may apply for a small scale suction dredge gold mining "permit". To be in the position of CEQA "project proponents". As, most certainly they own affected private property, and would defend those property rights, to protect them for their own their own benefit, and use. Just as any other private property owner would.

CDFG sent individual written "Notice" by US mail to all holders of active suction dredge permits, such permits were cancelled, no provision for refunds exist, and no future permits will be issued until such time as the various other stringent requirements of SB 670 are met.

However, CDFG did not give written "Notice" to all affected individual mining claim owners in California, SB 670 automatically made "project proponents". The CEQA process is normally triggered by a person, entity or agency applying for a "permit" to do something that may have a significant adverse effect on California's environment. If that is found to be the case, and the proposed project is not covered by any CEQA "exemptions". The CEQA process is triggered, and proceeds.

That whole CEQA body of law, regulation, and agenda is based on the premise, that a person, or entity having made an application for a permit, certainly has knowledge, and constructive notice of the process, as the applicant, or applicants themselves initiated it.

In this case, that is absolutely not so. Because all prospective applicants (i., e., all mining claim owners in California) who's private property rights will certainly be profoundly affected by this CEQA project, neither have, or were given "notice" of them being arbitrarily placed in the position of CEQA project applicants, or proponents.

In effect, what we have here is an adjudicative land use decision process, without the land, or property rights owners (i., e., mining claim owners) being legally informed, or given actual notice of the adjudication of crucial matters intensely affecting each of them, and all of their individual private property rights combined.

Under those factual conditions, without actual notice to all effected fee simple property and mining claim owners, the whole of the CEQA, APA process is fundamentally flawed from the beginning. For instance, CDFG scheduled three public "scoping" meetings the 16th, 17th & 18th of November, 2009, so that involved parties could submit questions, and/or comments on the process. Written comments on the process will not be entertained, if not submitted by December 3, 2009.

(LINK http://www.dfg.ca.go.../2009110201.asp)

In that CDFG gave no actual written notice to all affected patented, or unpatented "mining claim owners", statewide throughout California. Them lacking such notice of the process, scoping meetings, and comment submission deadline periods compounds the critical flaws being made here, one after the other by the state of California, and the lead agency (CDFG).

These critical administrative and procedural errors here, one after another, fatally "taint" the complete CEQA process regarding small scale suction dredge gold mining permits. To the degree each error, or cumulative multiple errors make the process more, and more subject to a whole series of "judicial" challenges. One, any, or all of which will certainly be brought by affected parties, in order to protect their private property rights.

The point being here, CDFG, and the company they paid $1.5 million dollars to made the initial crucial error of omitting the fact, the bulk of all small scale suction dredge gold mining throughout California takes place on "mining claims".

Then, compounds that error, by lacking an understanding, or ignoring all the "private property rights" mining claim owners have. Then, continues to compound their errors, by failing to give legal notice to all mining claim owners involved, of these administrative proceedings critically affecting their constitutionally protected private property rights.

Plainly, there are separate factual private property right issues involving tens of thousands of mining claims in California that, must be accepted and acted upon here.

Which would require restructuring and rewriting sections of the initial study report entirely distinct from those addressing potential enviromental issues.

Once done, and with legal notice given to all involved, including mining claim owners, new scoping meetings, and comment periods would be required. No one involved wants to suffer through this tedious expensive process twice. As such, it is incumbant on the lead agency to do it properly, the first time. Sadly, in this instance, I fear CDFG has pulled a few CEQA & APA triggers, far to soon. The prudent thing to have done, CDFG lacking a CA Attorney Generals legal opinion regarding legality issues, would have been to wait for the CA AG answer to the pending PLP lawsuit. As it will clarify the states legal position here, with regards to all involved mining claims, and associated private property rights those owners have.

Anyone thinking that all mining claim owners in California will stand idly by, doing nothing, while the state perpetrates an illegal regulatory "taking" of their property. Which deprives the owners of all of their property's utility and value. Unlawfully denying them of every benefit of the private property they own. Here, the California legislature, and CDFG is grossly mistaken, as doing so is a constitutionally forbidden de facto taking without compensation. Which mining claim owners throughout California will never allow.

If the state of California wish's to honestly "take" our property, to retain as a place where campers, swimmers, boaters, fishermen, casual recreational users, indian tribes and environmentalists can revel in the glory of it all, without small scale suction dredge gold mining happening there. The state must simply pay for what they take. Plain as that. .....

OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 08:07 AM (MDT)

22. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #21

When old gold miners have a hunch something of value is buried deep somewhere, they have the natural ingrained tenacity to keep digging, until they either go bust, drop dead, or find it. In reviewing this CEQA initial study report, and preparing written comments for submittal. I notice something, so obscure anyone but a seasoned old prospector would probably not take notice of, or take the time to inspect. Nor, for that matter make the effort to ferret out its worth, if any.

Now, imagine an old gold miner, hunched over a prospect hole, he had laboriously dug into for days on end.

Suddenly, he stands, inspects something in his hand, and shouts.....Eureka! I found it!

Then, does quick little jig, places his find, in his poke, and sets off towards the nearest town at a fast pace, chuckling to himself, as he goes.

Reality is, that's not the actual scene. But, the circumstance is the same. Follow along, if you wish.
_____
Page. 28 & 29
Notice of Preparation / Initial Study
Project No. 09.005

The environmental factors checked below would potentially be affected by this project (i.e., the project would involve at least one impact that is a "Potentially Significant Impact"), as indicated by the checklist on the following pages.

CHECK LIST

Aesthetics (checked)
Air Quality (checked)
Biological Resources (checked)
Cultural Resources (checked)
Hazards and Hazardous Materials (checked)
Hydrology/Water Quality (checked)
Noise (checked)
Recreation (checked)
Mandatory Findings of Significance (checked)
Mineral Resources (NOT CHECKED)
Signed, John McCamman, Chief Deputy Director 10/26/09
_____

The Chief Deputy Director of CDFG has made a knowingly deliberate, and utterly false official written statement here, by not checking the "Mineral Recourse" checklist box in this official CEQA initial study report. The consequence, of which might not seem readily apparent, nor even significant. However, I assure you, it is strikingly significant in several differing aspects involved here.

It is common knowledge, and utterly indisputable that gold, platinum, and other associated extremely valuable minerals are certainly "Mineral Resources".

It is common knowledge, and utterly indisputable that these valuable mineral resources certainly exist as placer deposits, within waterways throughout California.

It is common knowledge, and utterly indisputable that "suction dredging" is a widespread modern efficient small scale mining method thoughout California.
Clearly, that is what triggered this CEQA study.

It is common knowledge, and utterly indisputable that small scale suction dredging is usually profitable. Otherwise, no prudent person would invest in a suction dredge, nor spend time performing arduous labor to do it.

It is common knowledge, and utterly indisputable that relatively significant amounts of gold, and other valuable minerals are recovered by small scale suction dredging annually in California.

Given this indisputable series of facts. It is not possible by any stretch of imagination, or reality. That the Chief Deputy Director of CDFG, the very state agency that regulates all suction dredge permitting statewide throughout California, could assert small scale "suction dredging" does not involve, nor have a potentially significant impact on "Mineral Resources" within California.

Doing so, clearly and profoundly impugns the Chief Deputy Directors professional credibility, as well as destroys the reliability and total integrity of the very CEQA study, he now directs. Why the head of public agency would make a deliberate false statement in an official state document, is by itself incredulous. So, giving him the benefit of doubt, that is sane, there must be some other devious factor behind him doing it.

Impart, I gather no one caught this in the 1994 CEQA study, nor to date. If that is fact, then, I would assume the thinking in the present day high circles of CDFG is;

We got away with it once back then. No one ever caught on. Lets just do it again, here.

WRONG ANSWER

The reason that check list box is not checked, involves both CEQA & Surface Mining and Reclamation Act (SMARA) provisions.

The CEQA provisions impart are:

California Environmental Quality Act (CEQA) Guidelines Appendix G states that a project would have a significant impact on mineral resources if it would:

a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.

b. Result in the loss of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

(note, USFS & BLM lands -open to mineral entry- are all covered with federal land use plans that provide for both mining claims & mining on them)

SMARA provisions provide for a mineral lands inventory process termed classification-designation. The California Division of Mines and Geology, and the State Mining and Geology Board are responsible for administering this process and have statutory authority over it.

Areas are classified on the basis of geologic factors, without regard to existing land use and land ownership. The areas are categorized into four Mineral Resource Zones (MRZs).

The primary goal of the mineral land classification is to ensure that the mineral potential of the land is recognized by government decision-makers and considered before making land use decisions that could preclude mining.

CGS's Special Publication 51 provides the guidance for MRZ identification; the criteria for establishing the zones are based on four general categories:

MRZ-1 applies to areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.

MRZ-2 applies to areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence.

MRZ-3 applies to areas containing mineral deposits, the significance of which cannot be evaluated.

MRZ-4 applies to areas where available information is inadequate for assignment to any other zone.

Of the four categories, lands classified as MRZ-2 are of the greatest importance.

Such areas are underlain by demonstrated mineral resources where geologic data indicate significant measured or indicated resources are present. MRZ-2 areas designated by the Mining and Geology Board as "regionally significant" are incorporated by regulation into Title 14,Division 2 of the California Code of Regulations.

Such designations require that a lead agency′s land use decisions involving designated areas be made in accordance with its mineral resource management policies, and that it consider the importance of the mineral resource to the region or the state as a whole, not just to the lead agency′s jurisdiction.

SMARA provisions also exempt from permitting "prospecting for, or the extraction of, minerals for commercial purposes where the removal of overburden or mineral product totals less than 1,000 cubic yards in any one location, and the total surface area disturbed is less than one acre". Public Resources Code § 2714 (d)

Given that provisions of CEQA mandate SMARA application in a CEQA project, if "Mineral Resources" are involved. Another set of governing standards must be included within this CEQA process, otherwise it is fundamentally flawed from the onset, and any result, or determination made within it is illegitimate, and contrary to law.

The reason, CDFG intentionally omitted "Mineral Resources" is that whatever the outcome, when SMARA is included. SMARA determinations & law, would conflict with the purpose, and intent of CDFG′s findings. The end result being SMARA says you can, CDFG determinations, and any resulting regulations says you cannot.

Which would be arbitrary, capricious, an abuse of discretion or otherwise not in accordance with law, any way it might appear in CEQA documents.

Obviously, CDFG must have an Attorney Generals legal opinion to clarify how they can proceed here. Because, once they have written notice, or accept verbal or written comment regarding SMARA & facts pointed out here. They cannot deny actual or constructive notice of it. And, cannot proceed without inclusion of SMARA. This is, of course assumming they intend to proceed on sound legal footing.

If any public funds are expended, for costs involved in public meetings, or any proceeding, or study, that is not based on sound legal footing, and at any later date, any such meeting, proceeding or study is required by law to be repeated in full conformity with all applicable law. Duplicate spending to cover what should have been done right, the first time, is a total waste. For which someone must be held responsible. I would not want to be that person.

I′m not familiar with the California criminal code.
But, assume it has similar provisions to Federal Code, such as:

18 U.S.C. § 1001 : US Code - Section 1001: Statements or entries generally

(a) Except as otherwise provided in this section, whoever, in any matter within the jurisdiction of the executive, legislative, or judicial branch of the Government of the United States,

knowingly and willfully -

(1) falsifies, conceals, or covers up by any trick, scheme, or device a material fact;

(2) makes any materially false, fictitious, or fraudulent statement or representation; or

(3) makes or uses any false writing or document knowing the same to contain any materially false, fictitious, or fraudulent statement or entry; shall be fined under this title, imprisoned not more than 5 years.

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 08:09 AM (MDT)

23. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #22

The dangers of dredging on California rivers
Saturday, March 07, 2009
By Patricia Wiggins/In the Napa Valley Register
Some environmental problems are abstract, affecting places far away and species rarely seen. Others are as close as our supper plates.

The crash of salmon in California affects us all. This once-abundant fish, famed for huge king salmon in numbers so great they crowded our rivers, is now teetering at the edge of extinction.

These are not just trophy and sport fish. They form the backbone of California ecosystems, tribal cultures, local economies, a commercial fishing industry and a once-plentiful, wonderful food. Most Californians would mourn the loss of salmon, and rightly so.

This will likely be the second year in a row with no commercial or sport ocean salmon season. This is not an anomaly — it is the sad result of a long-term trend that government and the public have been unable to stop. And, as last year's no-catch season demonstrates, a blanket ban on fishing will not, by itself, reverse that trend.

Salmon have borne the brunt of development in California. With every major dam, they lose habitat. With every ounce of polluted runoff from farm or city, they lose water quality. With every quart pumped from once free-flowing rivers, they lose water. In-stream pumps trap juveniles against screens; invasive species steal habitat and eat young fish; wildland roads dump sediment into streams; and hatchery management practices are incapable of replacing natural spawning. Add to this the natural — and human-induced — changes wrought on climate, the ocean and streambeds, and the salmon face one tough uphill swim.

One pernicious practice affecting water quality and the beds of streams is motorized in-stream gold mining. Gasoline-powered engines on suction dredges on pontoons or rafts are used by people to scoop up riverbeds in order to find grains of gold in Northern California streams. Sediment from suction-mining covers emerging salmon in stream gravel. The suction alone, in the deep, cool parts of wild streams, kills young fish.

Statewide, there are about 3,000 miners operating in places like the Klamath, Scott and Shasta watersheds who buy permits from the California Department of Fish and Game. Resident permits cost about $50. Combined with non-resident permit sales, they generate from $150,000 to $200,000 annually for a program which costs DFG more than $1.25 million each year to enforce.

In contrast, California fishermen buy 2.4 million fishing licenses each year. The sport-fishing industry supports a total of 43,000 jobs paying $1.3 billion in wages and salaries annually. Fishing equipment sales total more than $2.4 billion per year. And salmon, highly susceptible to the impacts from suction dredges, are traditionally the most important fish to Northern California commercial fishermen and native tribes.

Yet late last month, the DFG rejected a petition to restrict mining in areas most important to fish. The department director seemed more swayed by a partisan letter from the Siskiyou County Board of Supervisors in support of the miners than ecological realities. In contrast to overwhelming evidence,

the board stated that there is no emergency.

DFG's action — or rather, the department's shameful lack of action — is unconscionable. Environmental choices should be based on fact, as well as on fair evaluation of economic realities. Gold mining is a recreational activity. Many commercial fishermen, along with sellers of fishing equipment and others in a multi-million-dollar industry, deserve equal if not greater consideration. DFG has already admitted publicly that the regulatory status quo is harming fish like the coho salmon.

DFG officials have a responsibility to protect our state's fishery resources, the livelihoods of our fishermen and women, and the supply of local seafood for our tables. And if they don't fulfill that responsibility, the state legislature, along with other concerned individuals and organizations, must hold them accountable.

Accordingly, I have introduced legislation to ban suction-dredge mining in California. While some miners will denounce a ban as infringing upon their "freedom," no human beings should be "free" to hasten the elimination of these magnificent fish. And millions of other Californians — including fishing families, recreational fishermen and salmon consumers — have an interest to protect, too.

We are, hopefully, at a turning point on the path of survival for California's salmon. There is an agreement in principle to remove dams on the Klamath River. There is reconsideration of delta pumping and water management. There are broad efforts to bring back the coho, with many people gritting their teeth to cooperate with a broad range of restrictions, starting with fishermen.

It is time for miners to give up their self-interest, to give these fish a moment to recover. And it's high time for the DFG to go from protecting miners to protecting fish — for all Californians.

(State Senator Patricia Wiggins, D–Santa Rosa, chairs the Joint Legislative Committee on Fisheries & Aquaculture. She represents California's 2nd District, which includes Napa County.)

Wiggins article above demonstrates how utterly misinformed she actually is about the facts, and legalities involved with both salmon, and small scale suction dredge gold mining in California.

From the prospective of "legalities", Wiggins is either ignorant of, or irrationally ignores "private property" law, and all the protections the US Constitution, California's Constitution, and federal & state law provide for it. The vast majority of small scale suction dredge gold mining in California takes place on "mining claims". Apparently Wiggins has no comprehension of what mining claims are, nor the "private property" rights such owners have.

Factually, valid mining claims are a form of private property, which are fully protected by the US & California Constitution, and all other law, that protects any other form of private property. Mining claim owners "own" the valuable minerals, such as gold within them. Thus, mining claim owners are entitled to extract gold, on their property, subject only to reasonable regulation. The same as any other property owner has the right to utilize his property, for his own economic benefit.

Wiggins is also ignorant of, or absurdly ignores critical facts about, salmon, and the salmon fishery in general. California law provides sports and commercial fisherman the "mere privilege" to catch & kill fish. The California Department of Fish & Game can modify, suspend, or revoke that license, for good reason, or cause at any time. As a fishing license is neither a "contract", or "private property" right of any sort. Conversely, a valid mining claim is private property, and the proprietor owns the valuable mineral in it, as well as the right to extract it.

Wiggins contends "...California fishermen buy 2.4 million fishing licenses each year. The sport-fishing industry supports a total of 43,000 jobs paying $1.3 billion in wages and salaries annually. Fishing equipment sales total more than $2.4 billion per year..."

That rational is absurd, in-so-far as she ignores, those 2.4 million fishing licenses, 43,000 jobs, and $1.3 billion in annual fishing equipment sales all exist for the sole purpose of killing fish, not protecting them.

Apparently, Wiggins believes that because more people are involved, and more money is spent annually in California to kill fish. That those same fish should be protected from far fewer people who don't spend as much money, and never intentionally harm, or kill fish. That reasoning is plainly illogical.

What has happened here, is Wiggins was foolishly hood-winked into believing all the distorted, biased, misinformation that the anti-suction dredge lobby flooded both California, and her with. Wiggins in utter contravention of her duty, as a legislator, failed to ascertain the true facts of the matter, and thoughtlessly threw her support behind them.

Then, Wiggins without full knowledge of the facts, or even comprehension of governing law, or the Constitutionally protected private property rights involved, threw togather badly written legislation creating SB 670. With Wiggins espousing the need for, and the good it would do, she convinced a majority of her fellow legislators, and the governor to pass SB 670, as law.

Which immediately implemented a statewide ban on all suction dredge gold mining, as an "urgency" measure, when no urgency, or emergency existed to support doing so. Within days of passage (August 6th, 2009), SB 670 was profoundly challenged in a federal court action, by Public Lands for People, suction dredge manufactures, and affected private citizens. Even to a laymen, SB 670 is obviously in direct contravention of various United States, and California Constitutional provisions protecting private property, as well as a long list of other associated laws.

I certainly applaud, and support good faith legitimate efforts to protect the environment, and fisheries in California. However, SB 670 is so illegitimate, erroneous, arbitrary, without basis in fact, or law. There is no doubt it will be soundly overturned in federal court, the sooner, the better.

Once that occurs, I would hope Wiggins, all legislators who voted for SB 670, and the Governor, who signed it into law, take full responsibility for all the damage, loss, cost, waste, hardship and harm SB 670 caused to all those it so unfairly, unlawfully, and badly damaged. In her article, Wiggins used the words "shameful" - "unconscionable" - "pernicious". Once SB 670 is overturned, I would hope Wiggins fully realizes those words apply to her. .....

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 08:44 AM (MDT)

24. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #23

LAST EDITED ON 11-16-09 AT 08:49 AM (MDT)

http://www.courthousenews.com/2009/09/16/SuctionMining.pdf

LINK TO PLP v. SB 670 LAWSUIT FOR ANYONE WHO CARES TO READ IT.

ENJOY, it's a WINNER

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 09:14 AM (MDT)

25. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #24

Two of the basic purposes of CEQA are to inform governmental decision-makers and the public about the potential significant effects, if any, of a proposed project and to provide opportunities for other agencies and the public to review and comment on draft environmental documents. The latter is crucial to the effectiveness of the former.

Depending upon the characteristics of a project and its potential for significant environmental effects, CEQA review may pursue one of three basic directions: (1) an exemption (statutory or categorical); (2) a negative declaration (including a mitigated negative declaration); or (3) an environmental impact report (EIR). Requirements for review, comment, and notice vary according to the complexity of the environmental review.

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CDFG sent individual written "Notice" by US mail to all holders of active suction dredge permits, such permits were cancelled, no provision for refunds exist, and no future permits will be issued until such time as the various other stringent requirements of SB 670 are met.

However, CDFG did not give written "Notice" to all affected individual mining claim owners in California, SB 670 automatically made "project proponents". The CEQA process is normally triggered by a person, entity or agency applying for a "permit" to do something that may have a significant adverse effect on California's environment. If that is found to be the case, and the proposed project is not covered by any CEQA "exemptions". The CEQA process is triggered, and proceeds.

That whole CEQA body of law, regulation, and agenda is based on the premise, that a person, or entity having made an application for a permit, certainly has knowledge, and constructive notice of the process, as the applicant, or applicants themselves initiated it.

In this case, that is absolutely not so. Because all prospective applicants (i., e., all mining claim owners in California) who's private property rights will certainly be profoundly affected by this CEQA project, neither have, or were given "notice" of them being arbitrarily placed in the position of CEQA project applicants, or proponents.

In effect, what we have here is an adjudicative land use decision process, without the land, or property rights owners (i., e., mining claim owners) being legally informed, or given actual notice of the adjudication of crucial matters intensely affecting each of them, and all of their individual private property rights combined.

Under those factual conditions, without actual notice to all effected fee simple property and mining claim owners, the whole of the CEQA, APA process is fundamentally flawed from the beginning. For instance, CDFG scheduled three public "scoping" meetings the 16th, 17th & 18th of November, 2009, so that involved parties could submit questions, and/or comments on the process. Written comments on the process will not be entertained, if not submitted by December 3, 2009.

(LINK http://www.dfg.ca.gov/news/news09/2009110201.asp)

In that CDFG gave no actual written notice to all affected patented, or unpatented "mining claim owners", statewide throughout California. Them lacking such notice of the process, scoping meetings, and comment submission deadline periods compounds the critical flaws being made here, one after the other by the state of California, and the lead agency (CDFG).

These critical administrative and procedural errors here, one after another, fatally "taint" the complete CEQA process regarding small scale suction dredge gold mining permits. To the degree each error, or cumulative multiple errors make the process more, and more subject to a whole series of "judicial" challenges. One, any, or all of which will certainly be brought by affected parties, in order to protect their private property rights.

The point being here, CDFG, and the company they paid $1.5 million dollars to made the initial crucial error of omitting the fact, the bulk of all small scale suction dredge gold mining throughout California takes place on "mining claims".

Then, compounds that error, by lacking an understanding, or ignoring all the "private property rights" mining claim owners have. Then, continues to compound their errors, by failing to give legal notice to all mining claim owners involved, of these administrative proceedings critically affecting their constitutionally protected private property rights.

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 09:27 AM (MDT)

26. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #25

CEQA § 21082.2. SIGNIFICANT EFFECT ON ENVIRONMENT;
DETERMINATION;
ENVIRONMENTAL IMPACT REPORT PREPARATION

(a) The lead agency shall determine whether a project may have a significant effect on the environment based on substantial evidence in light of the whole record.

(b) The existence of public controversy over the environmental effects of a project shall not require preparation of an environmental impact report if there is no substantial evidence in light of the whole record before the lead agency that the project may have a significant effect on the environment.

(c) Argument, speculation, unsubstantiated opinion or narrative, evidence which is clearly inaccurate or erroneous, or evidence of social or economic impacts which do not contribute to, or are not caused by, physical impacts on the environment, is not substantial evidence. Substantial evidence shall include facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts.

(d) If there is substantial evidence, in light of the whole record before the lead agency, that a project may have a significant effect on the environment, an environmental impact report shall be prepared.

(e) Statements in an environmental impact report and comments with respect to an environmental impact report shall not be deemed determinative of whether the project may have a significant effect on the environment.

CEQA requires that decisions be informed and balanced. It must not be subverted into an instrument for the oppression and delay of social, economic, or recreational development or advancement. (Laurel Heights Improvement Assoc. v. Regents of U.C. (1993) 6 Cal.4th 1112 and Citizens of Goleta Valley v. Board of Supervisors (1990) 52 Cal.3d 553)

The purpose of CEQA is not to generate paper, but to compel government at all levels to make decisions with environmental consequences in mind. (Bozung v. LAFCO (1975) 13 Cal.3d 263).

The lead agency must consider the whole of an action, not simply its constituent parts, when determining whether it will have a significant environmental effect. (Citizens Assoc. For Sensible Development of Bishop Area v. County of Inyo (1985) 172 Cal.App.3d 151)

CEQA does not require technical perfection in an EIR, but rather adequacy, completeness, and a good-faith effort at full disclosure. A court does not pass upon the correctness of an EIR's environmental conclusions, but only determines if the EIR is sufficient as an informational document. (Kings County Farm Bureau v. City of Hanford (1990) 221 Cal.App.3d 692)

15384. SUBSTANTIAL EVIDENCE
(a) "Substantial evidence" as used in these guidelines means enough relevant information and reasonable inferences from this information that a fair argument can be made to support a conclusion, even though other conclusions might also be reached. Whether a fair argument can be made that the project may have a significant effect on the environment is to be determined by examining the whole record before the lead agency. Argument, speculation, unsubstantiated opinion or narrative, evidence which is clearly erroneous or inaccurate, or evidence of social or economic impacts which do not contribute to or are not caused by physical impacts on the environment does not constitute substantial evidence.

(b) Substantial evidence shall include facts, reasonable assumptions predicated upon facts, and expert opinion supported by facts.

§ 21166. SUBSEQUENT OR SUPPLEMENTAL IMPACT REPORT; CONDITIONS
When an environmental impact report has been prepared for a project pursuant to this division, no subsequent or supplemental environmental impact report shall be required by the lead agency or by any responsible agency, unless one or more of the following events occurs:
(a) Substantial changes are proposed in the project which will require major revisions of the environmental impact report.

(b) Substantial changes occur with respect to the circumstances under which the project is being undertaken which will require major revisions in the environmental impact report.

(c) New information, which was not known and could not have been known at the time the environmental impact report was certified as complete, becomes available.

OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 10:51 AM (MDT)

27. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #26

DRAFT:

Initial Study
Suction dredge Permitting Program
Subsequent Environmental Impact Report
November 2009

COMMENTS:

Because this initial study is fundamentally flawed, a preface is necessary to establish why, how and where those fundamental flaws exist within it. The preface is also necessary to establish the true circumstance, applicable governing law, and facts. So the authors, and those responsible for the complication of this initial study can gain a clear understanding, and rational why it is fundamentally flawed.

PREFACE:

This Initial Study (IS) is fundamentally, and egregiously flawed from the beginning to end. In-so-far as the authors, from the onset are either ignorant of, ignore, or intentionally omit principle statutory law, facts, and circumstance directly applicable to the majority of all "suction dredge" gold mining that takes place in California.

This IS in totality is premised on multiple fundamental errors of fact, much of which are to one degree, or another out of context, distorted, lacks proportionality, is disingenuous, biased, or erroneous.

This IS contains intentional unlawful omissions of material facts. In-so-far as the CEQA check list incredulously omits that verifiable "Mineral Resources" in California will not be significantly affected. That is manifestly untrue.

In fact, this CEQA study will certainly have a significant affect on California's Mineral Recourses, and by CEQA guidelines, "Mineral Resource" must be included. If not, this CEQA study is fatally flawed from the beginning.

This IS also takes the position that; suction dredging is often "***recreational***" (5.1); and while suction dredging can take place almost anywhere in California, much of it takes place "***on private lands, or unpatented claims owned by mining clubs***"(5.5.8).

This information is not factual.

Factually, all valid unpatented placer mining claims are real property, in every sense of the word, and taxed as such, in California. When owners of valid unpatented placer mining claims choose to utilize a suction dredge to mine placer gold on their property. That use is not "recreational". It is premised on prudent investment based expectation to profit, just as any occupation, or small business has.

A valid mining claim provides the claim owner an exclusive possessory interest in the claim, a form of property that may be sold, transferred, or inherited without infringing the paramount title of the United States. The claim owner has the full legal right to access, explore, develop, utilized riparian water, mine, beneficiate and sell all valuable minerals recovered. Which, certainly includes ownership of the flow of income, and profit derived from these mining endeavors.

Patented mining claims grant the owner complete fee simple title to everything within the property. Valid unpatented mining claims grant the owner, the vested right to use any, or all surface as is necessary to develop, mine, beneficiate ore, including the use of water, and timber for mining purposes. These

rights are provided for by nondiscretionary statutory existing federal law. All have been tested to the Supreme Court level, withstanding challenges for well over a century. Applicable governing statutes, law, regulation and citations are attached as an addendum.

Presently, there are about twenty four thousand, eight hundred (28,800) registered active unpatented mining claims of record throughout California. Of those there are about ten thousand, five hundred (10,500) registered active unpatented "placer" claims. Suction dredging takes place on both unpatented lode & placer claims, where lode claims also contain auriferous gravels in streams or river within them. There are thousands of patented (fee simple) mining claims throughout California.

The vast majority of all suction dredging in California takes place on, and within unpatented mining claims. The bulk of the remainder takes place on patented (fee simple) mining claims. Only a miniscule percentage of suction dredging takes place on other fee simple types of private property. Mining clubs own only a tiny fraction of all existing unpatented mining claims of record in California. Consequently while mining clubs are receive both notoriety, and publicity, the majority of suction dredging in California takes place on unpatented placer claims owned by individuals.

All unpatented mining claims are situated on federal public domain lands, otherwise none would exist, as applicable federal land is the only place they may be initiated, held and worked. All are stringently regulated by applicable federal statutes, policy directives, and regulation's respectively found at 36 CFR 228, Et. Seq., & 43 CFR 3809, Et., Seq.

Under that federal authority, the U.S. Forest Service (USFS), and Bureau of Land Management (BLM) completely regulate every possible aspect of notice, access, permitting, occupancy, bonding, mining, and reclamation on all unpatented mining claim use nation wide. Explicit federal policy directly encourages mining on public domain lands. USFS & BLM are fully cognizant that private citizens have a statutory right, not a mere privilege to enter applicable federal public domain lands to explore for, locate, claim, develop, extract, and beneficiate pertinent valuable minerals so situated.

The standard of mining impacts provided for by federal regulation is to minimize all unnecessary or undue degradation. In doing so, the federal government fully recognizes that common sense, practicality, and reality mandates some degree of environmental degradation will occur in mining on public domain lands. Just as some degree of environmental degradation occurs in every other aspect of all land use practice nation wide. Otherwise, the modern infrastructure of all American civilization could not exist, nor sustain itself, as it historically has.

Certainly, the state of California is free to reasonably regulate all mining, including suction dredging within its boundaries. However, state agencies must rationally recognize the realities involved in such use of federal lands situated with California. That reality is, some degradation will occur, otherwise, for all practical purposes all mining would be impossible. State regulations must recognize that fact. Then, implement reasonable, practical regulation to minimize all unnecessary, or undue degradation to the environment, just as the federal government has.

If a state agency is unable, fails to, or ignores "reality", they clearly lack a basis of sound judgment to formulate practical, suitable, and fair regulation of anything. As resulting regulations could, and likely would be impractical, leading to confusion, consternation, and protracted costly litigation to clarify such arbitrary, or capricious regulation. None of which is in the regulating agency, or publics best interest.

Furthermore, the state here, either is not cognizant of, or intentionally ignores several unequivocal constraints it is bound by. Article VI, Section 2, of the U.S. Constitution provides that the "... Constitution, and the Laws of the United States ... shall be the supreme Law of the Land."

Explicitly, the State of California was admitted into the Union upon the express condition that the people of said State, through their legislature or otherwise, shall never interfere with the primary disposal of the public lands within its limits, and shall pass no law and do no act whereby the title of the United States to, and right to dispose of, the same shall be impaired or questioned.

Forty five percent (45%) of California is federal public domain. All unpatented mining claims are situated on those lands. The vast majority of all suction dredging takes place on those same lands. Most certainly the General Mining Law (30 USC 21-54), is both a statutory public domain land, and mineral disposal law. As such, the state of California is clearly barred from interfering, impairing, or even questioning

federal public domain land, and mineral (contained therein) disposal laws.

Again, certainly, the state of California can reasonably regulate mining. But such state regulation cannot conflict with, impair, abridge, or arbitrarily prohibit mining on federal public domain lands. The federal government established the General Mining Laws, pertaining to federal public domain. One cannot assert the General Mining Laws do not fully occupy the field, when in fact federal law established it. Thus, any state law in conflict with federal law is preempted.

The Fifth Amendment to the United States Constitution, made applicable to state and local governments by the Fourteenth Amendment, prohibits the government from taking private property for public use without just compensation. The California Constitution provides, "Private property may be taken or damaged for public use only when just compensation ... has first been paid to, or into court for, the owner." (Cal. Const., art. I, § 19.)

Today, suction dredge gold mining is the only practical productive mechanized means by which any ordinary citizen can profitably recover small scale placer gold deposits. Which are situated in gravels within California waterways traversing though unpatented placers mining claims, initiated, and held for that purpose.

Consequently, any arbitrary state regulation prohibiting suction dredge mining within unpatented mining claims constitutes an unlawful compensable "taking" of every possible economic benefit a mining claim proprietor owns. For, he owns nothing else, but the right to mine what is his, within his private property

END PREFACE:

COMMENTS:
Individual Page By Page, and Section Number Comments, with a rational of each, and, where applicable including governing statutory, regulatory, or case law citation.

1.

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 02:17 PM (MDT)

28. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #27

Here are some critical points that should be addressed to CDFG on this CEQA study:

CEQA studies are site specific. As each individual site where an environmental impact may occur that triggers a CEQA study has differing environmental factors.
There were approximately 3,500 suction dredge permits issued in California in 2009. Which would equate to 3,500 individual sites, based on permits issued.

However, there are 10,500 active unpatented placer mining claims situated on public domain lands in California. All of which would be potential suction dredging sites. There are also about 20,000 active unpatented lode claims in California, any of which could become subject to suction dredge gold mining.

There are about 100,000 patented fee simple mining claims in California. All of which are subject to suction dredging. There are millions of acres of fee simple private property adjoining California waterways, subject to potential suction dredging. There are millions of acres of federal public domain in California, subject to suction dredging.

The point being, considering any 1 single suction dredging site may effect 400 feet of California

waterway. Without doubt, there are at the very least 1 million potential individual possible suction dredge gold mining sites in California. If a figure of 10% is considered a "representative" sample of suction dredging sites?

That would require "operating" a small scale suction dredge in at least 100,000 individual sites, for at least an 8 hour work day at each site. In order to gather a fair representative sample of small scale suction dredging environmental effects in California.

Otherwise, it is literally impossible to collect a scientifically sound, or reliable data base, by which to determine the cumulative environmental effects of small scale suction dredging statewide. Furthermore, it would require rechecking each individual site, the following year, and the year after that. In order to determine, if any visual evidence of each site remains, and record what evidence remains, if any.

Furthermore, as most of those suction dredge sites are on unpatented, or patented fee simple mining claims. As well as other private property throughout California. It would require CDFG to have explicit written permission from each owner to dredge on each site. Otherwise, CDFG dredging tests for this CEQA study would be in violation of California "trespass" laws. Not to mention, perpetrate a "theft" of the any valuable mineral, CDFG recovers, or takes from any mining claim, or other private property.

Frankly, if CDFG recovers no placer "gold" in this study. It is impossible for then to rationally, or credibly assert they performed a fair, or representative suction dredge gold mining study at all.

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-16-09, 10:31 PM (MDT)

29. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #28

This California bucket line dredge moved more material in a single day, than 3500 small scale suction dredges do in a year.

Prolific salmon runs continued, even after many of these bucket line dredges operated for decades in many California rivers.

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OLD GOLD MINER
Member since 11-15-09
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11-18-09, 05:54 AM (MDT)

30. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #29

Another intentional omission of material fact & FALSE statement in the initial study report CEQA check list.

The "Land Use / Planning" box is not checked.

45% of California is Federal public domain lands.
Much of which is open to mineral entry under the Federal mining laws.
Much of which is held by mining claims.
Where most small scale suction dredging takes place.

All USFS & BLM lands are under one form or another of Federal "Land Use / Planning" .
Which encourage, provided for & allow mining on Federal lands.

Consequently, under CEQA regulations, this study must take that into consideration.
If not, it is fundamentally & fatally flawed.

Another critical "kink" for the DFG guys to consider.

The lead agency in a CEQA study "MUST" consult with pertinent agencies having statutory authority over land where the "project" takes place. Since 45% of California is Federal public domain, mostly administered under jurisdiction of the USFS & BLM.

DFG better start formal consultation with them.

If not, that's another fatal error in this CEQA process.

LOL, USFS & BLM will inform DFG, mineral extraction on a valid mining claim is a statutory right of the owner. DFG wants to ignore that fact. They cannot, if they "consult" with USFS & BLM.

Another critical "kink" for the DFG guys to consider.

DFG takes the position, "economic" impact need not be considered in this CEQA study.

WRONG ANSWER

CEQA law makes it mandatory they do.

Read it yourself.

_____

CEQA Title 14. Natural Resources
Division 6. Resources Agency
Chapter 3. Guidelines for Implementation of the California Environmental Quality Act
Article 7. EIR Process
§ 15093. Statement of Overriding Considerations.
(a) CEQA requires the decision-making agency to balance, as applicable, the economic, legal, social, technological, or other benefits of a proposed project against its unavoidable environmental risks when determining whether to approve the project. If the specific economic, legal, social, technological, or other benefits of a proposal project outweigh the unavoidable adverse environmental effects, the adverse environmental effects may be considered "acceptable."

_____

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-18-09, 08:53 AM (MDT)

31. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #30

GOOD info on Suction dredging effects

http://www.icmj.com/UserFiles/file/recent-news/Joseph-Greene-suction-gold-dredge-study.doc

http://www.goldgold.com/legal/Declaration_of_Claudia_Wise.pdf

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OLD GOLD MINER
Member since 11-15-09
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11-18-09, 09:00 AM (MDT)

32. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #31

The Official Minerals Policy of the United States of America

United States Code
TITLE 30
MINERAL LANDS AND MINING
CHAPTER 2 - MINERAL LANDS AND REGULATIONS IN GENERAL

Sec. 21a. National mining and minerals policy; "minerals" defined; execution of policy under other authorized programs

The Congress declares that it is the continuing policy of the Federal Government in the national interest to foster and encourage private enterprise in (1) the development of economically sound and stable domestic mining, minerals, metal and mineral reclamation industries, (2) the orderly and economic development of domestic mineral resources, reserves, and reclamation of metals and minerals to help assure satisfaction of industrial, security and environmental needs, (3) mining, mineral, and metallurgical research, including the use and recycling of scrap to promote the wise and efficient use of our natural and reclaimable mineral resources, and (4) the study and development of methods for the disposal, control, and reclamation of mineral waste products, and the reclamation of mined land, so as to lessen any adverse impact of mineral extraction and processing upon the physical environment that may result from mining or mineral activities. For the purpose of this section "minerals" shall include all minerals and mineral fuels including oil, gas, coal, oil shale and uranium. It shall be the responsibility of the Secretary of the Interior to carry out this policy when exercising his authority under such programs as may be authorized by law other than this section.

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-18-09, 09:03 AM (MDT)

33. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #32

PUBLISHED BY THE WASHINGTON ALLIANCE OF MINERS AND PROSPECTORS
with additions by Steve Herschbach of Alaska Mining & Diving Supply
I. INTRODUCTION

Listed below is a number of quotes from studies that have been done over the years, please keep in mind that some were done on large 50 + cubic yard per hour placer mining operations, others were done on a variety of suction dredges, and some were done in a laboratory environment. All were done by well respected and educated people only a few of which have had any practical experience with placer mining/prospecting. The quotes listed in this document were taken word for word out of the documents written by the scholars named above each quote.

A. By: Paul J. Badali - 1988

"Several federal and state laws charge various governmental agencies to provide for the protection of these habitats. Our nation's technology based society has an ever increasing need for mineral resources, gold included. An ever growing number of people enjoy Recreational Gold Dredging as a hobby. Suction dredge operators working valid federal mining claims have a constitutional right under the 1872 mining laws to recover the valuable minerals present in the substrate. Private property owners and holders of state minerals leases also have rights to recover gold and other minerals present in streams and rivers. How can the country's need for natural resources, the individual's right or desire to mine, and need to protect the environment all be realized and satisfied?"

II. ENTRAINMENT

A. By: Phillip A. North - 1993

"While adult fish did not show a sensitivity to entrainment it is unlikely that they would be sucked into a dredge in the first place. They have the ability to avoid entrainment in a suction dredge by moving to a safer location. All of the investigators who examined the impacts of suction dredges on adult fish concluded that this life stage was not acutely affected (Harvey 1986, Hassler et al. 1986, Summer and Hassler 1992). Harvey (1986) found this to be the case for rainbow trout on streams he studied in California."

III. FEED AND FISH

A. By Dr. Henry Baldwin Ward

"most significant is a possible relation of fine silt to the food of young fish. It has been shown that the presence of finely divided suspensoids of natural origin may be of advantage to the microbiota which constitutes the foundation element in the food supply of water. Studies on aquatic biology conducted by the Wisconsin Survey demonstrated that colloidal organic particles collect on carbon and sand grains to build a culture medium for aquatic bacteria".

B. By: Thomas J. Hassler, William L. Somer, Gary R. Stern - 1986

"During diving surveys, we observed Salmon gairdneri congregating and selectively feeding on benthic invertebrates displaced by dredging."

"Suction dredge mining at levels observed in Canyon Creek probably did not impact steelhead feeding. The mining did not significantly reduce the abundance of aquatic invertebrates (only species composition locally) and steelhead fed opportunistically. In fact , juvenile steelhead were observed feeding on invertebrates that had been entrained in and dislodged by dredge. Thomas (1985) observed cutthroat trout feeding on dislodged invertebrates in the dredge outfall. "However, weight of juvenile steelhead from Canyon Creek was greater than weight from other areas and production (kg/ha) was as good or better than in other areas (table 41)." "Ecological differences between Canyon Creek and BEF were also important in determining colonization of samplers. Overall, the impacts of suction dredge mining to benthic invertebrates at the study site were minimal."

C. From: Robert Lewis, Pollution Bioanalyst III - 1962

"Benthos survival is noted in Table 2. Insects with internal extrusions were listed as mortalities. The morality figure of 7.4 percent may be extreme because of confinement in the sack. Many caddis larvae were still attached to rocks after passing through the dredge. All insects except those with extrusions appeared lively and unharmed."

"To determine stream distance necessary for insects to settle back to the bottom, a net was placed 15 feet and 25 feet downstream from the outflow. After five minutes at the former distance, Trichoptera, Coleoptera and Diptera were prevalent in the net. Only one Plecoptera was noted. At 25 feet downstream only few insects were caught in the net after five minutes. Underwater inspection with a faceplate indicated that all insects settled within 40 feet. The approximate flow throughout this distance varied from 1 ft./sec. down to 0.5 ft./sec."

D. By: Phillip A. North - 1993

"If recolonization is slow the cumulative impacts of suction dredge mining could be significant over a period of seasons. However, in all of the studies on suction dredges that investigated this question the disturbed stream reach was relatively short (on the order of a few tens of meters) and recolonization proved to be rapid. Griffith and Andrews (1981) found that the dredged site was "substantially recolonized" after 38 days. The abundance within orders of invertebrates were the same before and after dredging and "key" taxa were also the same. Harvey (1986) found that recolonization was complete in terms of numbers of insects within 45 days of dredging. Thomas (1985) sampled the site 30 days after dredging and found, again, that colonization was "substantially complete" for most groups. The number of invertebrates colonizing the artificial substrates used by Somer and Hassler (1992) did

not increase after the first sampling at two weeks. None of these investigators sampled their study site earlier than the reported time of recolonization. Recolonization may have occurred sooner than the time reported."

E. By: The U.S. Environmental Protection Agency - 2001

"The results from Resurrection Creek indicated that there was no difference in the macroinvertebrate community between the mining area and the locations downstream of the mining area in terms of macroinvertebrate density and taxa richness. The sampling was done 35 days after mining had been completed for the season and shows a rapid recovery of the mined areas."

IV. FLUSHING FLOWS

A. By: Gary R. Stern - 1988

"The autumn, winter and spring peak flows of WY 1985 Canyon Creek were adequate to disperse dredge tailing piles and fill in dredge holes. Less than 9% of the holes and tailings from 1984 mining were visible at the start of the 1985 dredge season. Only two sites from 1984 had clear remnants of holes and tailings in 1985. Both of these were far from the stream's thalweg. At a few sites large cobbles and boulders piled along the shore remained visible one year later. Thomas (1985) reported that piles of cobbles remained along the shore one year later at Gold Creek, Montana, but holes and instream tailings had vanished. Harvey et al. (1982) found virtually no evidence of dredge mining the following year in the American River, California. Most streams with mobile beds and good annual flushing flows should be able to remove the instream pocket and pile creations of small suction dredges, although regulated streams with controlled flows may not."

V. SEDIMENT

A. By: Dr. Henry Baldwin Ward

"All of these tests show .That the amount of colloidal material in the water of the Rouge River and its tributaries below the point at which the run-off of placer mine workings has been added to the stream is to small to produce on the bottom a "blanket" which might affect adversely young fish eggs in the nests if present, or the fish food in the water." "Even below the points at which tributaries entered from areas in which placer mining had gone on at earlier months in the year, no change from normal conditions were observed. The pools sheltered migrating fish; they were also seen in the stream below the dams, and a normal supply of fish food was found at various points visited."

These studies were done on commercial placer mining!

"The supplementary report of Mr. A. M. Swartley, who aided me in the part of the survey made in September, 1937, is of value in giving the views of a careful and experienced geologist. He confirmed fully statements I had reached in my preliminary report as to the physical conditions found in the Rogue River drainage, and especially the small amount of clay and other material on shores and stream bottoms, in backwaters and otherwise in our examination of the river and its tributaries. He discussed fully the methods of rock disintegration and the transportation and ultimate character of the materials produced. He emphasized the fact that mining debris "is chemically inert, makes no oxygen demand on the stream and therefore takes away from the flowing water nothing which the fish require. This is equally true of this material whether placed in transit by nature or by man since (the products) are alike in nature, come from the same sources and are only being accelerated by man in their journey to the sea." Further he stated:" All these materials entering the streams, whether by natural or human activity, whether coarse or fine, whether traveling on the bottom, in suspension or solution ,are almost altogether inert, suffer little change on their way to the sea, and having reached the end point of chemical change do not rob the water of oxygen which the fish demand, or add to the water toxic agents injurious to fish (fish food or other forms of life)."

VI. EFFECTS OF SILT ON FISH

A. By: Dr. Henry Baldwin Ward

"I have seen among these Alaska rivers in which salmon run and spawn some so heavily loaded with mud that one could not trace the body of an adult salmon ascending the river even when the dorsal fin cut the surface of the water. Yet the fish examined on the spawning grounds just before and just after death showed that the gills had suffered no injuries on the way though the body had met with conspicuous external damage through violent contact with sharp rocks at rapids or falls or along the shore. The examination was made in connection with the study on the cause of death after spawning and all organs were closely inspected. The gills were reported as apparently in perfect condition. Although the object of the investigation was not to determine the effect on the gills of silt loaded waters, still, if any evident injury had been present, it would have been noted. The journey up the Copper and its tributary was long and strenuous; the chance for damage to the salmon from muddy water was certainly large if any damage could be wrought by such conditions, and yet none was observed. Many other similar cases could be cited from printed as well as published records."

"Despite their far greater sensitiveness to changes in environment and susceptibility to injury, the young salmon lived heartily in a concentration of sediment which was at its minimum (760 ppm) twice as much as the maximum recorded at Agness (see Table II). Indeed the average amount of turbidity in Griffin's experiments was ten times the average recorded at Agness. Those who think that normal erosion products will prove injurious to such fish should examine carefully the records in these tables."

VII. EFFECT ON SPAWNING GROUNDS

A. By: Dr. Henry Baldwin Ward

"Normally the fish cover the eggs by a layer of sand or fine gravel; the fresh water carrying oxygen easily penetrates this cover and the young wriggle out after the eggs hatch. A thin, broken layer such as I have already described would not interfere with the permeation of fresh water with oxygen and the development of such eggs as might be present. But I am clear that this is not a true spawning area. As Mr. Joseph Wharton said in an admirable paper on the salmon of the Rogue River, "It is the ambition of all these species of anadromous fish to ascend the river to the highest point attainable before making their spawning beds, seeking the waters that are purest and coldest." This statement is absolutely correct; In difficult streams or when held behind man-made barriers, these fish struggle to the end to make their way upstream and will sacrifice life rather than accept spawning areas in the lower reaches of the river. The urge which drives them on is the basis for the safety of the race. For the straggler or the weakling who may find the achievement of headwaters impossible, an enforced spawning in the lower river is of no significance; the river level varies too widely and its current at full flood is too fierce. Eggs deposited at high water will be exposed and die when the water falls; or if the spawning occurs at a lower water level, the next flood waters will bury the eggs or sweep them away. The suddenness, the violence and the irregularity of the changes in water level of the Rogue are conspicuous in the records of every year."

B. By: Thomas J. Hassler, William L. Somer, Gary R. Stern

"Dredge tailings are often referred to as good salmonid spawning substrate. In the Trinity River, chinook salmon have been observed spawning in the tailing piles of suction dredges (E. Miller pers. comm.). Steelhead in Idaho streams have been reported to spawn in gravels recently disturbed by human activities (Orcutt et al. 1968). In the American River , Prokopovich and Nitzberg (1982) have shown salmon spawning gravels have mostly originated from old placer mining operations."

"Anadramous salmonids held and spawned in Canyon Creek in close proximity to suction dredge activity. During the 1984-1985 spawning season, fall-run chinook salmon, coho salmon and steelhead spawned in areas actively dredged during the 1984 dredge season (fig.). In August 1985, spring-run chinook salmon and summer-run steelhead were holding near areas where suction dredges were being operated (fig. 23). During the 1985 spawning season, fall and spring-run chinook salmon spawned in areas actively dredged during the 1985 dredge season (fig. 24)."

C. By: Gary R. Stern - 1988

"Suction dredge mining did not appear to influence the locations of adult anadramous salmonid summer-holding areas. One spring-run chinook salmon was observed 50 m below an operating dredge and a summer-run steelhead was seen at the upper end of a 30 m-long pool while a dredge was operating at the lower end. Seven other adult salmonids were observed within 250 m of an active dredge operation and none appeared to be disturbed by mining activities. During a 1980 diving survey by Freese (1980),

an adult spring-run chinook salmon was observed holding at the bottom of an abandoned dredge hole in Canyon Creek and other adult salmonids were found in close proximity to active dredges. No relation between holding areas of spring/summer-run fish and suction dredge mining operations was apparent during this study or in 1980 (L. Freese pers. comm.)."

VIII. CHANGES IN THE STREAM BED

A. By : Dr. Henry Baldwin Ward

"To be sure no one can think rightly of the stream itself as a constant environment. On the contrary it is undergoing continual change. The amount and location of winter's snowfall, the volume and time of seasonal rains, the duration and precise period of regional droughts, and other climatic variations produce variations in water level, in bank erosion, in growth of grasses, underbrush and trees in the drainage basin; thus sudden and often extreme changes in contours of the banks and surrounding country add sediments of different types to its waters and modify the conditions under which the fish it harbors are forced to live." Number one on the list of things that change the shape of the stream bed are DAMS!"

B. By: Thomas J. Hassler, William L. Somer, Gary R. Stern - 1986

"However during the suction dredge mining process, a new pool area is created by the cone shaped dredge hole. Dace, suckers and juvenile steelhead were observed feeding and resting in Canyon Creek dredge holes. Freese (1980) observed a small spring-run chinook salmon holding in a dredge-created pool on Canyon Creek".

"The majority of suction dredge operators in canyon creek did not work long periods or disturb large areas of the streamed. Dredging impacts upon the channel geomorphology were confined to the area dredged and the area immediately down stream."

"Winter and spring flushing flows filled in dredge holes and dispersed tailing piles." "Coho salmon and steelhead juveniles appeared to rear normally in the creek and were observed using dredge holes in the summer. Steelhead juveniles received the greatest exposure to dredging activity as they rear in Canyon Creek up to three years, but their feeding, growth and production did not seem to be impacted at the current level of dredge activity."

C. By: Somer and Hassler - 1992

"The effects of the two dredges on aquatic insects varied with taxa and were site specific. Dredging dislodged insects, and we observed young coho salmon and steelhead feeding on them. The stream underwent major but localized changes. Dredge hole were excavated to a depth of 2 m, and substrate was altered to bedrock and large cobbles-probably a poor habitat for colonization. However, the effects of dredging (at the operating level during the study) on insects and habitat were minor compared with those of bed-load movement due to large stream flows during storms and from snowmelt."

D. By: Gary R. Stern - 1988

"Lewis (1962) was the first to investigate the effects of the portable suction gold dredge on the aquatic habitat of fish and benthic invertebrates. He operated a 12.7 cm aperture dredge in Clear Creek, Shasta County, California and found that dredging could improve the intergravel environment for both fish eggs and benthos if the stream was mined in a uniform manner."

"If dredge mining regulations were expounded upon and miners were made aware of the instream habitat needs of salmonids, the most serious impacts of suction dredge mining could be reduced. Suction dredgers may even be able to enhance certain areas of the channel for rearing and spawning fish, if some of the limiting factors of a reach of stream are identified (ie. cover, woody debris, low velocity refuges, clean gravels). In Canyon Creek, current CDFG suction dredge regulations eliminate conflicts with salmonid spawning, incubation, and fry emergence by restricting mining to summer months. The 15.24 cm maximum aperture size for dredges is appropriate since stream substrate is large, but larger apertures may be too disruptive in the small channel."

E. By: Robert Lewis, Pollution Bioanalyst III

Results of Gold Suction Dredge Investigation;

"Table 1 lists stand pipe results. The site average indicates an improvement from dredging of 1 p.p.m. in DO and a threefold improvement in permeability and velocity. As indicated above, dredged sand settled within 12 feet of the sluice outflow. This occurrence tends to somewhat nullify removal of sediment, but dredged areas are definitely relieved of compaction. As a gross measure, the standpipe was much easier to drive in the dredged area. As evidenced by photographs the gravel appears much cleaner after dredging. Weighing all factors, dredging can improve the gravel environment for both fish eggs and aquatic insects, especially if the operator mined uniformly in one direction as opposed to a pocket and pile method."

F. By: Phillip A. North - 1993

"The four studies that I reviewed from journals subject to peer review consistently found that when certain limitations are placed on suction dredge activity the impacts on the stream ecosystem are local and of short duration."

G. By: Bret C. Harvey - 1986

"Fish and invertebrates displayed considerable adaptability to dredging, probably because the streams naturally have substantial seasonal and annual fluctuations (Moyle et al. 1982). These fluctuations, in the form of flushing winter flows, can greatly reduce the long term impact of dredging. Even during the relatively mild winter of 1980/81, high flows still filled the hole created by dredging on NFAR with a sand and gravel mixture and eliminated all sand from the main streamed. After the high flows in winter and spring of 1981/82, no substrate changes caused by dredging in the previous summer were evident on Butte Creek. Saunders and Smith (1965) observed a quick recovery in the trout population after scouring of a heavily silted stream, which, along with the quick temporal recovery of stream insects seen in this study, implies that suction dredging effects could be short-lived on streams where high seasonal flows occur."

IX. TEMPERATURE

A. By:Thomas J. Hassler, William L. Somer, Gary R. Stern - 1986

"and dredge mining had little, if any, impact on water temperature."

X. TURBIDITY

A. By: Dr. L. E. Giiffin

"When the test ended on Dec. 30, it was found that a much larger proportion of the fish in the sediment -containing trough had survived (56%) than in the clear water trough (10%). There was no noticeable difference in the color of the surviving fish in the two troughs, and the fish which had lived in the muddy water were as large as the survivors from the clear-water trough."

"The results of the experiments indicate that young trout and salmon are not directly injured by living for considerable periods of time in water which carries so much soil sediment that it is made extremely muddy and opaque. They also indicate that cutthroat trout and salmon fingerlings can feed and grow apparently well in very muddy water."

B. By: Dr. Henry Baldwin Ward

"In contrast with all these the experiments of Dr. Griffin have shown that young fish live well up to 30 days in good water mixed with an amount of natural soil materials from two to three times as large as the extreme load of the materials contributed to the Rogue River by maximum conditions produced by placer mining."

"All the evidence that has been obtained justifies the conclusion that no present-day contributions of materials produced by bank erosion differ in character or exceed in amount those added periodically by purely natural processes in past times. Splendid runs of salmon and steelhead were established and maintained under truly natural conditions which certainly were on occasion more extreme and violent before man ever came into the picture than they are today. Furthermore, there is good reason to believe that placer mining run-off was larger in amount and more continuous in the early years of that industry when for a time at least greater areas were followed than are employed today."

This study was done to study the effects of large scale placer mining operations!

XI. WATER QUALITY

A. By: Thomas J. Hassler, William L. Somer, Gary R. Stern

Water quality was impacted only during the actual operation of a suction dredge. Since a full day of mining by most Canyon Creek operators included only 2 to 4 hours of dredge running time, water quality was impacted for a short time.

B. By: Gary R. Stern - 1988

"Turbidity plumes below suction dredges are often markedly visible due to extremely low ambient turbidity levels in mountain streams. The extent of the plume depends on the grain size and volume of the material passing through the dredge. Horizons of silt-laden substrate were disturbed at all dredge sites in Canyon Creek and created highly visible turbidity plumes. "

"Although distinct to even the most casual observer, dredge plumes in Canyon Creek were probably of little direct consequence to fish and invertebrates. Suspended sediment concentrations of 20,000 to 100,000 mg/l which impact fish feeding and respiration (Cordone and Kelly 1961) greatly exceed the highest level of 274 mg/l measured in Canyon Creek. In general, dredge turbidity plumes were highly localized and occurred during midday which is not a peak feeding period for steelhead (Moyle 1976). Laboratory studies by Sigler et al. (1984) found that steelhead and coho salmon preferred to stay in channels with clear water, and turbidities as little as 25 NTU's caused a reduction in fish growth. In contrast to Sigler's results, young steelhead in Canyon Creek appeared to seek out dredge turbidity plumes to feed upon dislodged invertebrates even though clear flowing water was available nearby."

C. By: Phillip A. North - 1993

"Most water quality studies of the effects of suction gold dredges on streams have focused on turbidity and suspended sediments. These studies have, with some exceptions, largely found that water quality is impacted for a distance downstream of the dredge ranging from a few meters to 30 meters."

"However, Huber and Blanchet (1992) found no evidence of cumulative impacts of mining on water quality in streams of the Chugach National Forest in Alaska. They monitored streams in the Forest over a period of three years and found no noticeable impact to water quality associated with suction dredges. All of the studies that I surveyed came to the same conclusion: suction gold dredging had localized and short term impacts. Caveats must be taken into account when coming to this conclusion:

All of these studies, except one involved small dredges, 6 inches or less. The one study that involved a larger dredge reported only a small amount of data. Five water samples were taken 500 feet below a six inch dredge and one sample was taken 500 feet below an 11 inch dredge."

D. By: The U.S. Environmental Protection Agency - 2001

"In the 1997 permit, EPA defined a small suction dredge as those with nozzles less than or equal to four inches. EPA is proposing to redefine the small suction dredge range as less than or equal to six inches. Information provided in EPA's suction dredge study and the United States Geological Survey (USGS) study support the conclusion that there are local but short term effects on both water quality and macroinvertebrate communities in the mining areas. On the Fortymile River, dredges larger than those proposed under this GP showed that turbidity was reduced to background levels within 250 feet. It is expected that small dredges would have even less impact on the downstream receiving water quality."

XII. REFERENCES

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Hassler, Thomas J., Somer, William L., Stern, Gary R., 1986, Impacts of Suction Dredge Mining on Anadramous Fish, Invertebrates and Habitat in Canyon Creek, California. California Cooperative Fishery Research Unit, U.S. Fish and Wildlife Service, Humbolt State University, Cooperative Agreement No. 14-16-0009-1547, Work Order No. 2, Final Report.

Huber, C. and D. Blanchet, 1992, Water quality cumulative effects of placer mining on the Chugach National Forest, Kenai Peninsula, 1988-1990. U.S. Forest Service, Chugach National Forest, Alaska Region. 74 pages.

Lewis, Robert Pollution Bioanalyst III, 1962, Results of Gold Suction Dredge Investigation. Memorandum of September 17, 1962. California Department of Fish and Game. Sacramento, California, 7 pp.

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Somer, W. L., and Hassler, T. J., 1992, Effects of suction-dredge gold mining on benthic invertebrates in Northern California Stream. North American Journal of Fisheries Management 12:244-252.

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U.S. Environmental Protection Agency, 2001, Fact Sheet NPDES Permit AKG-37-5000, U.S. Environmental Protection Agency, Region 10, Alaska Operations Office, 16 pp.

The quotes listed in this document were taken word for word out of the documents written by the scholars named above each quote.

This information was compiled with the intent to inform and educate, so the true facts can be a part of the process in the rule/regulation making pertaining to small scale placer mineral/metal mining and prospecting in our rivers and streams.

With special thanks to the Washington Alliance of Miners and Prospectors and Jerry Hobbs.

OLD GOLD MINER
Member since 11-15-09
81 posts

11-18-09, 09:12 AM (MDT)

34. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #33

In 1993 the U.S. Army Corps of Engineers (Corps) and U.S. Environmental Protection Agency (EPA) were subject to a court decision that forced them to issue new rules regarding suction dredging in Alaska.

A challenge to this decision resulted in a new decision in May 1999 that the Corps, at least, was not required to regulate suction dredging in most cases. Unfortunately, the same decision states that because of another court decision, Rybachek v. EPA, 904 F.2d 1276 (9th Cir. 1990) resuspension of materials by placer miners as part of gold extraction operations is an "addition of a pollutant" under the CWA (Clean Water Act) subject to EPA's regulatory authority.

The final result of all this legal action is that the Corps issued General Permit 88-02P for Alaska that covers most suction dredge activities automatically

The main reason this SPECIAL PUBLIC NOTICE 94-10 is presented here is to show the Corps finding of de minimis (i.e., inconsequential) effects on aquatic resources for suction dredges with nozzle openings of 4 inches or less.

This is an official recognition of what suction dredgers have long claimed; that below a certain size, the effects of suction dredging are so small and so short-term as to not warrant the regulations being imposed in many cases. The U.S. Environmental Protection Agency (EPA), in particular, has ignored this concept, although numerous studies, including the EPA's own 1999 study of suction dredging, repeatedly and consistently support the Corps finding de minimis effects. The reports consistently find no actual impact of consequence on the environment, and so almost always fall back to the position that "potential for impact exists".

However, showing potential for harm, and showing that actual harm exists are two different things, and the studies to date have not shown any actual effect on the environment by suction dredging except for those that are short-term and localized in nature.

Current regulatory efforts are proceeding despite this lack of evidence showing that harm to the environment is taking place. The regulatory agencies should be consistently and continually challenged by the dredging community to produce sound, scientific evidence that support their proposed regulations. To regulate against a "potential for harm", where none has been shown to exist, is unjustifiable and must be challenged.

Public Notice
US Army Corps of Engineers

Alaska District Regulatory Branch
Post Office Box 898
Anchorage, Alaska 99506-0898

Date: 13 SEPTEMBER 1994
Identification No.: SPN 9410
In reply refer to above Identification Number

SPECIAL PUBLIC NOTICE 94-10

APPLICATION OF THE "EXCAVATION RULE" TO RECREATIONAL PLACER MINING ACTIVITIES IN ALASKA FOR THE PURPOSE OF THE CORPS' SECTION 404 REGULATORY PROGRAM

Changes to regulations of the U.S. Army Corps of Engineers (Corps) and U.S. Environmental Protection Agency published August 25, 1993, in the FEDERAL REGISTER (FR) at 58 FR 45008 are affecting regulation of recreational placer mining activities in Alaska. The new regulations, referred to as the "excavation rule" became effective on September 24, 1993, and were described in a joint Alaska District Corps the United States and Environmental Protection Agency, Region X, Special Public Notice (93-15) dated September 17, 1993.

The Department of the Army (DA) exerts regulatory jurisdiction over waters of the United States, which includes wetlands, pursuant to Section 404 of the Clean Water Act. For regulatory purposes, the Corps defines waters of the United States as those waters below the high tide line of any tidal water body (ocean, estuary, etc.), and those waters below the ordinary high water mark of non-tidal water bodies (creeks, rivers, ponds, lakes, etc.). Wetlands are defined as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. The law requires that any individual or entity that proposes to discharge dredged and/or fill material into or excavate material from wetlands or other waters of the United States must obtain a DA permit (sometimes called "404 permits") prior to conducting the work. Under the new regulations, this means that recreational placer mining by means of suction dredging, hand mining, or other excavation in non-navigable waters now requires DA authorization.

The preamble for the new regulations stated that some excavation activities may generally (except in extraordinary situations) have de minimis (i.e., inconsequential) effects on aquatic resources including their associated functions and values and therefore would not degrade or destroy waters of the United States and would not be regulated.

The Alaska District Corps has reviewed recreational placer mining using suction dredges and hand mining (pick and shovel, panning, etc.) activities in light of the new "excavation rule" and has determined, except in extraordinary circumstances, that recreational suction dredge mining using an intake nozzle size equal to or less than 4 inches and hand mining in waters of the United States would have de minimis effects on the aquatic environment, provided the State of Alaska Department of Fish and Game requirements for fish-bearing waters are met. Therefore, these activities, as described above, will generally not be regulated by the Corps and no permit is required. However, the Alaska District Corps retains the discretion to require authorization on a case-by-case basis. (emphasis added)

The fact that no authorization or permit is required from the Corps for recreational placer mining, as described above, does not relieve any miner from the necessity to obtain any other permits or authorizations required by other entities. Consequently, the Alaska Department of Fish and Game and any applicable land management agency (Bureau of Land Management, National Park Service, U.S. Forest Service, Alaska Department of Natural Resources, etc.) should be contacted prior to conducting recreational placer mining to identify any possible requirements or restrictions on mining activities.

OPERATION OF LARGER SUCTION DREDGES

Operation of suction dredges with an intake nozzle size greater than 4 inches generally has more than de minimis effects on the aquatic environment and therefore requires authorization from the Corps under Section 404 of the Clean Water Act. At the current time, an individual DA permit is required for these activities, unless the mining is "ongoing" and a request for the operation to be grandfathered was received by August 25, 1994 (as described in the excavation rule published on August 25, 1993)

GRANDFATHER PROVISION OF THE "EXCAVATION RULE". Section 404 authorization is not required for discharges of dredged material associated with ditching, channelization, or other excavation activities in waters of the United States, including wetlands, where such discharges were not previously regulated and where such activities had commenced or were under contract to commence prior to August 25, 1993, and where such activities were completed before August 25, 1994. The Corps retains the authority to grant, on a case-by-case basis, an extension of this 12-month grandfather provision subject to the following conditions:

1. The excavation activity is of the type that occurs on an "ongoing" basis, either periodic or continuously (e.g., mining operations);

2. The discharger had submitted to the Corps, within the 12-month period between August 25, 1993, and August 25, 1994 , an individual permit application seeking a Section 404 authorization for such excavation activity; and

3. In no event can the grandfather provision be extended beyond August 25, 1996.

**Note: The deadline for filing an extension for an operation under the grandfather provision of the excavation rule was August 25, 1994. All rights under the grandfather provision were forfeited if an application was not submitted by that date. The Alaska District Corps has accepted the 1994 State of Alaska Annual Placer Mining Applications (APMAs) on file for the purpose of reserving grandfathering rights in accordance with the excavation rule. Any placer miner conducting excavation activities that have not been determined to have de minimis effects, as described above, must contact us at the address below and specify in writing those excavation activities in the 1994 APMA that they wish to continue as an "ongoing" operation. Interested parties should contact us by March 31, 1995, if they intend to do so.

As stated, currently all suction dredge operations, with an intake nozzle diameter greater than 4 inches, that do not qualify for or have forfeited their grandfather rights, require Corps authorization before proceeding. The Alaska District is in the process of modifying its placer mining general permit (GP 88-02M) to include suction dredge mining operations. At this time, we have not determined if there will be a size limitation to suction dredges that would be covered under the modified placer mining general permit. However, the Corps anticipates that many suction dredge mining operations may qualify for the modified general permit. A Special Public Notice advertising and requesting comments on the proposed placer mining general permit (GP 88-02M) changes will be issued in the near future.

FOR FURTHER INFORMATION

Additional information may be obtained by contacting the Corps at (907) 753-2712, or toll-free in Alaska at (800) 478-2712, or at the following address:

U.S. Army Corps of Engineers
Alaska District Regulatory Branch
Post Office Box 898
Anchorage, Alaska 99506-0898

BY AUTHORITY OF THE SECRETARY OF THE ARMY:

Date: 13 Sep 94

Peter A. Topp
Colonel, Corps of Engineers
District Engineer

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-18-09, 09:23 AM (MDT)

35. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #34

Most rivers and streams flood on a regular basis. During floods, impacts similar to those caused by suction dredges occur on a vastly wider scale. It is now believed that the regular movement of sediment in a stream is vital to it's health, much as forest fires have come to be seen as a vital part of the life-cycle of a forest. The life in and around a stream or river not only is not hurt by irregular turbidity and rechannelization effects, it has evolved to need these events to occur periodically for the environment to remain healthy. A major threat to the health of many streams is now seen to be the construction of dams. Many of these dams were originally built to help control flooding. Now it is seen that this has actually led to damage to the ecosystems of these streams. This new research sheds new light on suction dredging, and reveals that the movement of sediments in a stream not only does no harm, but is beneficial to the stream. The following website explores this new area of investigation.

http://walrus.wr.usgs.gov/grandcan/flood.html

OLD GOLD MINER
Member since 11-15-09
81 posts

11-18-09, 09:31 AM (MDT)

36. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #34

United States Department of Agriculture
Forest Service
Siskiyou National Forest
200 NE Greenfield Road
Grants Pass, OR 97526-0242
Reply to: 2800
Date: October 16, 1995

Subject: A comparison of stream materials moved by mining suction dredge operations to the natural sediment yield rates

To: The Record

A question that has frequently been asked is how much material is moved by annual mining suction dredge activities on the Siskiyou National Forest and how does this figure compare with the natural movement of such materials by surface erosion and mass movement? At the conclusion of the 1995 summer suction dredge season, the responsible minerals personnel on each Ranger District of the Siskiyou National Forest were asked to make a quantitative estimate of the number of cubic yards of material that was moved over the season by suction dredge operations. The estimates were based on on-the-ground observations carried out over the summer. Quantities of moved material ranged from 23 to 1920 cubic yards per district with a Forest total of 2413 cubic yards for the season.

Three documents were examined to determine a reasonable estimate of natural sediment yield rates. A published 1985 study by Michael P. Ainaranthus et al entitled "Logging and Forest Roads Related to Increased Debris Slides in Southwestern Oregon" found that natural erosion rates for debris slides in the Klamath Mountains of southwest Oregon averaged about 0.5 cubic yards per acre per year. This same study found that erosion rates on roads and landings were 100 times those on undisturbed areas, while erosion on harvested areas was seven times that of undisturbed areas. In another study (unpublished) done in 1988 by Jon Vanderheyden et al entitled "Siskiyou National Forest Silver Fire Recovery Process Paper", surface and channel erosion rates were estimated and then an estimate of total natural erosion rates was made by summing a debris slide rate with surface and channel rates. The debris slide rate was developed for the Siskiyou National Forest from an inventory that examined landslide activity between 1956 - 1976 on 137,000 acres of the Forest. This 1985 study estimated that baseline sediment yield (total natural erosion rate) in the Silver Creek basin averaged about 14.2 tons per acre per decade. For the Indigo Creek basin sediment yield averaged 8.0 tons per acre per decade. Putting these figures on an annual basis and using a generally accepted average of 1.5 tons per cubic yard of material would produce sediment yields of 0.95 and 0.53 cubic yards per acre per year for Silver and Indigo Creeks respectively. The Siskiyou National Forest Land and Resource Management Plan of 1989 estimated that the average natural sediment yield rate for the Forest from both mass movement and surface erosion was 0.5 tons per acre per year. This figure equals about 0.33 cubic yards per acre per year and is the most conservative of the natural sediment yield figures found in the literature readily available.

There are 1,092,302 acres on the Siskiyou Natural Forest. Using a factor of 0.33 cubic yards per acre per year times 1,092,302 acres will produce a very conservative estimate that 331,000 cubic yards of material move each year from natural causes compared to the 2413 cubic yards that was moved by suction dredge mining operations in 1995 on the Siskiyou. This would be a movement rate by suction dredge mining that equals about 0.7% of natural rates.

/s/ Michael F. Cooley
MICHAEL F. COOLEY
Recreation, Lands and Minerals Staff Officer, Siskiyou National Forest

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russau
Member since 7-9-03
4929 posts

11-19-09, 06:50 AM (MDT)

37. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #36

man thats a lot of information!

russau

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jerhobbs2
unregistered user

11-19-09, 11:10 AM (MDT)

38. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #37

This is great information and should be read by all. I am not sure where old miner came from but do know that he is very knowledgable and will certainly aid in this battle with teh DFG.

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-19-09, 01:21 PM (MDT)

39. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #38

CEQA CHECKLIST

Land use planning NOT CHECKED

45% of California is federal public domain.
All of which is under USFS / BLM land use plans
All of which encourages mining, and allow it under USFS & BLM Reg's.
_____

CEQA § 15086. Consultation Concerning Draft EIR.
(a) The lead agency shall consult with and request comments on the draft EIR from:
(1) Responsible agencies,
(2) Trustee agencies with resources affected by the project, and
(3) Any other state, federal, and local agencies which have jurisdiction by law with respect to the project or which exercise authority over resources which may be affected by the project,
including water agencies consulted pursuant to section 15083.5.
(4) Any city or county which borders on a city or county within which the project is located.
_____

USFS & BLM exercise authority over mineral resources where almost all small scale suction dredging takes place.

CEQA § 15086 (a) "shall" = Mandatory

Any CEQA "consultation" with USFS/BLM to say the least, will be interesting.

USFS/BLM will inform them "Under the mining laws a person has a statutory right, consistent with Departmental regulations, to go upon the open (unappropriated and unreserved) Federal lands for the purpose of mineral prospecting, exploration, development, extraction and other uses reasonably incident thereto." (See 30 U.S.C. § 21-54, 43 C.F.R. § 3809.3-3, 0-6).

_____

CEQA § 15086(4) Any city or county which borders on a city or county within which the project is located.

Go Ahead, DFG consult with El dorado County.

Below is El dorado Counties stance re: SB 670

10-06-2009 El dorado County, California, Board of Supervisors passed a resolution urging the California State Legislature and Governor Arnold Schwarzenegger to rescind or amend SB670, a bill that banned suction dredging in California waterways.

Resolution: http://www.co.el-dorado.ca.us/bos/wwwroot/attachments/6a4d4486-d831-4508-bd94-be91a14d2f1c.pdf

Agenda item with supporting documentation: http://www.co.el-dorado.ca.us/bos/wwwroot/detailreport/matter.aspx?key=10883

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-20-09, 00:01 AM (MDT)

40. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #39

LETS GET SOME FACTS:

http://www.thefirstamendment.org/publicrecordsact.pdf

California Department of Fish & Game
DFG Headquarters
1416 9th Street, Sacramento, CA 95814

Dear Sir, or Madame;

Pursuant the California Public Records Act (§§ 6250 - 6276.48), I respectfully request legible copies of any "contract" and/or any/all documents pertinent to the specific terms, conditions, performance, responsibilities, and payments to Horizon Water and Environmental, LLC as it pertains to the California Environmental Quality Act (CEQA) study, as mandated by SB 670 that firm is performing for your agency.

Please advise me in advance if applicable copy fee's will exceed one hundred dollars ($100).

I look forward to your response, within ten (10) days.

Sincerely,

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-20-09, 03:44 AM (MDT)

41. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #40

The legislative Act SB 670 covers suction dredge gold mining "in any river, stream, or lake of this state".
The clear intent, and unambiguous language of the Act specifically covers "in-stream" suction dredging activities only.

DFG's regulatory authority pursuant to DFG Code section 5653 et seq., pertains to the use of vacuum and suction dredge equipment in California for "in-stream" mining.
Related provisions of the DFG Code underscore that exact point.
Recently enacted DFG Code section 5653.1 covers the use of suction dredge equipment for in-stream mining.

The critical word in both the SB 670 law, and subsequent CDFG regulation is "in-steam".
In-stream clearly means in the waters of a stream, river or lake in California.
In effect, anything outside the water, not in-stream in waters of California, on dry land is beyond the scope of both SB 670 law, and subsequent DFG regulations.

Given that explicit statutory, and regulatory limitation pertinent to suction dredge gold mining in California.
DFG has no legal authority to regulate anything about suction dredge gold mining, not in-stream, or otherwise outside waterways in California.

The legal consequence of that is that DFG has no authority to let a contract to any firm to perform a California Environmental Quality Act (CEQA) environmental study, or report concerning anything not in-stream, in any steam, river, or lake in California.

Consequently, the SB 670 CEQA initial study report performed by Horizon Water & Environment greatly exceeds the boundaries of "in-steam" environmental impact.
As the initial study report, by both statutory law, and DFG regulation is expressly limited to in-stream environmental effects.

Thus, all matters within the initial study report relating to:
"Accessing the Site" (5.5.2)
"Delivering Equipment" (5.5.3)
Dry land "Processing of Material" (5.5.7)
"Encampments" (5.5.10)
Dry land "Aesthetics"
Dry land "Air Quality"
Dry land "Biological Resources"
Dry land "Cultural Recourses"
Dry land "Geology & Soils"
Dry land "Hazardous Materials"
Dry land "Noise"
Dry land "Public Services"
Dry land "Recreation"

Are all outside the scope of in-stream environmental impacts this initial study report is allowed to contain.
While SB 670 authorized this CEQA study.
No SB 670 statutory provisions, or DFG regulations exist to authorize the inclusion of any environmental effect anywhere other than "in-stream", in California waterways.

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-20-09, 02:22 PM (MDT)

42. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #41

CDFG MUST act according to law, when making "regulation" in California.

CDFG vigorously attempts to circumvent any need or requirement of the law that mandates Federal Mining Law & Economic impacts be considered, or included in this SB 670 CEQA study.

However, APA law governing "regulation" any state agency makes requires they do.

Below is just a tiny part of APA law.

NONE of which CDFG has complied with.
On that basis alone, any CDFG regulation not in compliance with APA.
Is arbitrary, capricious & not according to law.

We have a "unique" situation here. CEQA was never intended to be a tool to implement statewide REGULATION of any small business, or investment based economic endeavor, by private individuals, such as "small scale suction dredge gold mining".

A CEQA "Project" is "Site Specific". In this instance the legislature in passing SB 670 made the "Project" statewide. And, mandated implementation of NEW STATE REGULATION to cover it.

That being FACT.
CDFG must implement APA procedure, into the process, beside CEQA.
They have not, nor appear to intend to.
That is contrary to California APA law.

CDFG must comply with APA law, or repeat the process, to do so.
Doing this wrong, the first time, then having to repeat it to correct initial fatal flaws.
Is a WASTE of taxpayer funds.
For which someone must be held responsible.
I would NOT want to be that man.
_____

The Administrative Procedure Act (APA) establishes rulemaking procedures and standards for state agencies in California. The requirements set forth in the APA are designed to provide the public with a meaningful opportunity to participate in the adoption of state regulations and to ensure that regulations are clear, necessary and legally valid. The APA is found in the California Government Code, section 11340 et seq. State regulations must also be adopted in compliance with regulations adopted by OAL (see California Code of Regulations, Title 1, sections 1-280).

11342.510. Unless the provision or context otherwise requires, the definitions in this article govern the construction of this chapter.

11342.520. "Agency" means state agency.

11342.535. "Cost impact" means the amount of reasonable range of direct costs, or a description of the type and extent of direct costs, that a representative private person or business necessarily incurs in reasonable compliance with the proposed action.

11342.580. "Plain English" means language that satisfies the standard of clarity provided in Section 11349.

11342.590. "Prescriptive standard" means a regulation that specifies the sole means of compliance with a performance standard by specific actions, measurements, or other quantifiable means.

11342.595. "Proposed action" means the regulatory action, notice of which is submitted to the office for publication in the California Regulatory Notice Register.

11342.600. "Regulation" means every rule, regulation, order, or standard of general application or the amendment, supplement, or revision of any rule, regulation, order, or standard adopted by any state agency to implement, interpret, or make specific the law enforced or administered by it, or to govern its procedure.

11342.610. (a) "Small business" means a business activity in agriculture, general construction, special trade construction, retail trade, wholesale trade, services, transportation and warehousing, manufacturing, generation and transmission of electric power, or a health care facility, unless excluded in subdivision (b), that is both of the following:
(1) Independently owned and operated.
(2) Not dominant in its field of operation.

11346.2. Every agency subject to this chapter shall prepare, submit to the office with the notice of the proposed action as described in Section 11346.5, and make available to the public upon request, all of the following:

(a) A copy of the express terms of the proposed regulation.

(1) The agency shall draft the regulation in plain, straightforward language, avoiding technical terms as much as possible, and using a coherent and easily readable style. The agency shall draft the regulation in plain English.

(2) The agency shall include a notation following the express terms of each California Code of Regulations section, listing the specific statutes or other provisions of law authorizing the adoption of the regulation and listing the specific statutes or other provisions of law being implemented, interpreted, or made specific by that section in the California Code of Regulations.

(3) The agency shall use underline or italics to indicate additions to, and strikeout to indicate deletions from, the California Code of Regulations.

(b) An initial statement of reasons for proposing the adoption, amendment, or repeal of a regulation. This statement of reasons shall include, but not be limited to, all of the following:

(1) A statement of the specific purpose of each adoption, amendment, or repeal and the rationale for the determination by the agency that each adoption, amendment, or repeal is reasonably necessary to carry out the purpose for which it is proposed. Where the adoption or amendment of a regulation would mandate the use of specific technologies or equipment, a statement of the reasons why the agency believes these mandates or prescriptive standards are required.

(2) An identification of each technical, theoretical, and empirical study, report, or similar document, if any, upon which the agency relies in proposing the adoption, amendment, or repeal of a regulation.

(3) (A) A description of reasonable alternatives to the regulation and the agency's reasons for rejecting those alternatives. In the case of a regulation that would mandate the use of specific technologies or equipment or prescribe specific actions or procedures, the imposition of performance standards shall be considered as an alternative.

(B) A description of reasonable alternatives to the regulation that would lessen any adverse impact on small business and the agency' s reasons for rejecting those alternatives.

(C) Notwithstanding subparagraph (A) or (B), an agency is not required to artificially construct alternatives, describe unreasonable alternatives, or justify why it has not described alternatives.

(4) Facts, evidence, documents, testimony, or other evidence on which the agency relies to support an initial determination that the action will not have a significant adverse economic impact on business.

(5) A department, board, or commission within the Environmental Protection Agency, the Resources Agency, or the Office of the State Fire Marshal shall describe its efforts, in connection with a proposed rulemaking action, to avoid unnecessary duplication or conflicts with federal regulations contained in the Code of Federal Regulations addressing the same issues. These agencies may adopt regulations different from federal regulations contained in the Code of Federal Regulations addressing the same issues upon a finding of one or more of the following justifications:

(A) The differing state regulations are authorized by law.

(B) The cost of differing state regulations is justified by the benefit to human health, public safety, public welfare, or the environment.

(c) A state agency that adopts or amends a regulation mandated by federal law or regulations, the provisions of which are identical to a previously adopted or amended federal regulation, shall be deemed to have complied with subdivision (b) if a statement to the effect that a federally mandated regulation or amendment to a regulation is being proposed, together with a citation to where an explanation of the provisions of the regulation can be found, is included in the notice of proposed adoption or amendment prepared pursuant to Section 11346.5. However, the agency shall comply fully with this chapter with respect to any provisions in the regulation that the agency proposes to adopt or amend that are different from the corresponding provisions of the federal regulation.

11346.3. (a) State agencies proposing to adopt, amend, or repeal any administrative regulation shall assess the potential for adverse economic impact on California business enterprises and individuals, avoiding the imposition of unnecessary or unreasonable regulations or reporting, recordkeeping, or compliance requirements. For purposes of this subdivision, assessing the potential for adverse economic impact shall require agencies, when proposing to adopt, amend, or repeal a regulation, to adhere to the following requirements, to the extent that these requirements do not conflict with other state or federal laws:

(1) The proposed adoption, amendment, or repeal of a regulation shall be based on adequate information concerning the need for, and consequences of, proposed governmental action.

(2) The state agency, prior to submitting a proposal to adopt, amend, or repeal a regulation to the office, shall consider the proposal's impact on business, with consideration of industries affected including the ability of California businesses to compete with businesses in other states. For purposes of evaluating the impact on the ability of California businesses to compete with businesses in other states, an agency shall consider, but not be limited to, information supplied by interested parties. It is not the intent of this section to impose additional criteria on agencies, above that which exists in current law, in assessing adverse economic impact on California business enterprises, but only to assure that the assessment is made early in the process of initiation and development of a proposed adoption, amendment, or repeal of a regulation.

11346.5. (a) The notice of proposed adoption, amendment, or repeal of a regulation shall include the following:

(1) A statement of the time, place, and nature of proceedings for adoption, amendment, or repeal of the regulation.

(2) Reference to the authority under which the regulation is proposed and a reference to the particular code sections or other provisions of law that are being implemented, interpreted, or made specific.

(3) An informative digest drafted in plain English in a format similar to the Legislative Counsel's digest on legislative bills. The informative digest shall include the following:

(A) A concise and clear summary of existing laws and regulations, if any, related directly to the proposed action and of the effect of the proposed action.

(B) If the proposed action differs substantially from an existing comparable federal regulation or statute, a brief description of the significant differences and the full citation of the federal regulations or statutes.

(C) A policy statement overview explaining the broad objectives of the regulation and, if appropriate, the specific objectives. (4) Any other matters as are prescribed by statute applicable to the specific state agency or to any specific regulation or class of regulations.

(5) A determination as to whether the regulation imposes a mandate on local agencies or school districts and, if so, whether the mandate requires state reimbursement pursuant to Part 7 (commencing with Section 17500) of Division 4.

(6) An estimate, prepared in accordance with instructions adopted by the Department of Finance, of the cost or savings to any state agency, the cost to any local agency or school district that is required to be reimbursed under Part 7 (commencing with Section 17500) of Division 4, other nondiscretionary cost or savings imposed on local agencies, and the cost or savings in federal funding to the state. For purposes of this paragraph, "cost or savings" means additional costs or savings, both direct and indirect, that a public agency necessarily incurs in reasonable compliance with regulations.

(7) If a state agency, in proposing to adopt, amend, or repeal any administrative regulation, makes an initial determination that the action may have a significant, statewide adverse economic impact directly affecting business, including the ability of California businesses to compete with businesses in other states, it shall include the following information in the notice of proposed action: (A) Identification of the types of businesses that would be affected.

(B) A description of the projected reporting, recordkeeping, and other compliance requirements that would result from the proposed action.

(C) The following statement: "The (name of agency) has made an initial determination that the (adoption/amendment/repeal) of this regulation may have a significant, statewide adverse economic impact directly affecting business, including the ability of California businesses to compete with businesses in other states. The (name of agency) (has/has not) considered proposed alternatives that would lessen any adverse economic impact on business and invites you to submit proposals. Submissions may include the following considerations: (i) The establishment of differing compliance or reporting requirements or timetables that take into account the resources available to businesses. (ii) Consolidation or simplification of compliance and reporting requirements for businesses. (iii) The use of performance standards rather than prescriptive standards. (iv) Exemption or partial exemption from the regulatory requirements for businesses."

(8) If a state agency, in adopting, amending, or repealing any administrative regulation, makes an initial determination that the action will not have a significant, statewide adverse economic impact directly affecting business, including the ability of California businesses to compete with businesses in other states, it shall make a declaration to that effect in the notice of proposed action. In making this declaration, the agency shall provide in the record facts, evidence, documents, testimony, or other evidence upon which the agency relies to support its initial determination. An agency's initial determination and declaration that a proposed adoption, amendment, or repeal of a regulation may have or will not have a significant, adverse impact on businesses, including the ability of California businesses to compete with businesses in other states, shall not be grounds for the office to refuse to publish the notice of proposed action.

(9) A description of all cost impacts, known to the agency at the time the notice of proposed action is submitted to the office, that a representative private person or business would necessarily incur in reasonable compliance with the proposed action. If no cost impacts are known to the agency, it shall state the following: "The agency is not aware of any cost impacts that a representative private person or business would necessarily incur in reasonable compliance with the proposed action."

(10) A statement of the results of the assessment required by subdivision (b) of Section 11346.3.

(11) The finding prescribed by subdivision (c) of Section 11346.3, if required.

(12) A statement that the action would have a significant effect on housing costs, if a state agency, in adopting, amending, or repealing any administrative regulation, makes an initial determination that the action would have that effect. In addition, the agency officer designated in paragraph (14), shall make available to the public, upon request, the agency's evaluation, if any, of the effect of the proposed regulatory action on housing costs.

(13) A statement that the adopting agency must determine that no reasonable alternative considered by the agency or that has otherwise been identified and brought to the attention of the agency would be more effective in carrying out the purpose for which the action is proposed or would be as effective and less burdensome to affected private persons than the proposed action.

(14) The name and telephone number of the agency representative and designated backup contact person to whom inquiries concerning the proposed administrative action may be directed.

(15) The date by which comments submitted in writing must be received to present statements, arguments, or contentions in writing relating to the proposed action in order for them to be considered by the state agency before it adopts, amends, or repeals a regulation.

(16) Reference to the fact that the agency proposing the action has prepared a statement of the reasons for the proposed action, has available all the information upon which its proposal is based, and has available the express terms of the proposed action, pursuant to subdivision (b).

(17) A statement that if a public hearing is not scheduled, any interested person or his or her duly authorized representative may request, no later than 15 days prior to the close of the written comment period, a public hearing pursuant to Section 11346.8.

(18) A statement indicating that the full text of a regulation changed pursuant to Section 11346.8 will be available for at least 15 days prior to the date on which the agency adopts, amends, or repeals the resulting regulation.

(19) A statement explaining how to obtain a copy of the final statement of reasons once it has been prepared pursuant to subdivision (a) of Section 11346.9. (20) If the agency maintains an Internet Web site or other similar forum for the electronic publication or distribution of written material, a statement explaining how materials published or distributed through that forum can be accessed. (b) The agency representative designated in paragraph (14) of subdivision (a) shall make available to the public upon request the express terms of the proposed action. The representative shall also make available to the public upon request the location of public records, including reports, documentation, and other materials, related to the proposed action. If the representative receives an inquiry regarding the proposed action that the representative cannot answer, the representative shall refer the inquiry to another person in the agency for a prompt response. (c) This section shall not be construed in any manner that results in the invalidation of a regulation because of the alleged inadequacy of the notice content or the summary or cost estimates, or the alleged inadequacy or inaccuracy of the housing cost estimates, if there has been substantial compliance with those requirements.

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-20-09, 02:58 PM (MDT)

43. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #42

APA & what it is all about:

http://www.oal.ca.gov/Administrative_Procedure_Act.htm

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dredgeman
Member since 11-2-09
19 posts

11-20-09, 03:03 PM (MDT)

44. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #42

Hello Old Gold
Since we are guessing is your name Dennis

I called Stopher who is on Friday official statewide day off.
So I called Horizon and left a message. Michael called back and I asked a little about who determined the criteria for the study. Since as you point out "in stream suction mining" is the area of authority. Mike said that the DFG lawyers included the other variables. Since it is a statewide "PROJECT" they wanted to cover all angles of a new law suit.

I called back and clarified that CEQA is project specific and asked if the cities and counties of CA were notified. Mike said that DFG had notified the county registrars office.

He stumbled around agreeing that CEQA is site specific for each project. When I said CEQA was site specific and that DFG made the state a Project he felt that the project was in CA not CA.

After playing dumb and asking if the regs apply to the state, how is the state not the project. Mike informally agreed that the state was the project.

I also asked if the DFG was going to notifiy all the claim holders where dredging could take place. He felt that DFG had made reasonable attempts at notification of the affected people.

Just some of the fun today. fyi

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-20-09, 04:19 PM (MDT)

45. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #44

No need to guess my name. It is "Jim". I would prefer to remain reasonably anonymous. Simply because I don't need, or want any notoriety. Nor, want to get "flooded" with more correspondence than I have time to deal with or answer.

I'm a retired large corporate & mid-level public & private venture mining engineer. Who, since retirement has remained active in small scale placer mining & own mining claims over industrial mineral deposits & placer gold deposits in California, Oregon, Nevada & Idaho

I got involved here, because members of my immediate & extended family were making a living, suction dredging. SB 670 pulled $10,000 a month, right out of their pockets. That is wrong. To help right that wrong, I got involved.

But, would rather be out prospecting, or mining. Rather than spend endless days pouring over tons of law, in finding, reviewing, compiling & posting all the fatal faults in SB 670, the CEQA study & any proposed new regulation DFG might try to implement.

SB 670 is a badly written, idiotic, fatally flawed law. CDFG implementation of it, is helter-skelter & arbitrary to say the least. These California bureaucrats are pushing this whole process through, as though all the miners it effects. Are someone they can lead around by the nose, as if we are sheep. WRONG ANSWER.

Here, it appears CDFG is standing on a rooftop, urinating on a crowd of affected miners below, taking their livelihood, and private property rights. While shouting to the crowd. It's just "rain", don't worry everything is fine & legal. WRONG ANSWER

So, I have been pouring over all applicable law, finding what is applicable that these autocrats have not complied with. Then, throw those legally binding wrench's right smack in the gears of this SB 670 & CEQA process.

With the intent, just possibly of making then realize, this process is so "FUBAR" that maybe we out to do it correctly. It is also meant to exhaust every administrative & legal remedy possible, while the process is occurring. To create a record of factual legal evidence within it's record. To have sufficient legal grounds to appeal or challenge, any/all aspects of it in a court of competent jurisdiction. As that may become applicable.

PLP v. SB 670 is in play. But, there is no assurance, how any ruling there may come out, or when. I just want to insure, we have the involved faults on the record, as the CEQA process plays out. In case they are needed anywhere, in the process, or court action, to defeat SB 670.

LOL, yes.... You throwing monkey wench's on the desks of the autocrats, for them to see.....makes them stutter. Be sure to get any/all comments in/on the written record. That is the pile of legal fuel, to burn SB 670 into ashes.

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Gold Seeker
Member since 12-26-07
125 posts

11-20-09, 05:25 PM (MDT)

46. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #45

Old Gold Miner,

I can appreciate your wanting anonymity.

I want you to know that it is very much appreciated that you are involved in this research, you are helping so many more than just your family members!!

I have copied and pasted this entire thread to date and saved it in Microsoft Word for a backup and for my future reference, I will continue to follow this thread and add it to that Word document.

I don't want to see your hard work lost as it almost was on the Nugget Shooter Forum.

We have needed some very big guns in this fight and I want to THANK YOU for bringing in the BATTLESHIP!!

You have my greatest respect,

Skip, A.K.A. Gold Seeker, Au Seeker

Seek and Ye Shall find, and when you do thank GOD!!!

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Mark_NC
Member since 11-12-09
4 posts

11-20-09, 05:30 PM (MDT)

47. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #45

Jim,

I am just curious if anyone has looked into Horizon's background any at all? Looking over their website, it clearly states that the company was founded in 2008. I find it relatively hard to believe that a company little more than 1 year old could be tasked with such an important undertaking as this EIR. Was this a bidding process where they were bidding against other firms? Horizon's website only claims 2 prior projects, both being for Sonoma County to the tune of 1.85 million dollars. Could it be possible that they were created just for the purpose of giving certain CDFG officials with "green" agendas, a report that they desire, not a report that is factual? I wonder how many environmental activist groups they may be tied to as well?

I may be grasping at straws here, but it just seems odd that we see no previous work from this group to prove they are capable of performing the duties they have been hired to do. This smells of some form of collusion IMHO.

It also appears to me that Horizon and certain CDFG officials could be guilty of a criminal act if this could be proven. After all, they are taking taxpayer money as payment for the study. There could also be some civil liability there on Horizon's part. I hope they have plenty of money in their budget for legal fees if they tank this study. (on purpose or otherwise).

Anyway, just my feeble mind wandering aloud. I also say a big thank you for the efforts you are putting forward on this.

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OLD GOLD MINER
Member since 11-15-09
81 posts
11-20-09, 06:38 PM (MDT)

48. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #47

http://horizonh2o.com/mission.html

Kenneth Schwarz, Ph.D

http://www.scwrp.org/resumes/Schwarz.pdf

Michael Stevenson – Watershed Scientist. M.S. Yale University, School of Forestry and Environmental Studies (emphasis on Watershed Management and Restoration); B.A. University of California, Santa Cruz, Environmental Studies. Six years of experience.
Contribution: Senior Peer Review – Hydrology and Water Quality

Both use to work for Jones & Stokes.

http://www.climatechangefocusgroup.com/

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Goldfinds
Member since 8-24-09
6 posts
11-20-09, 07:05 PM (MDT)

49. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #42

LAST EDITED ON 11-20-09 AT 07:07 PM (MDT)

OGM

Reading the Administrative Procedure Act

reference to Article 8. Judicial Review 11350-11350.3

11350. (a) Any interested person may obtain a judicial declaration as to the validity of any regulation or order of repeal by bringing an action for declaratory relief in the superior court in accordance with the Code of Civil Procedure. The right to judicial determination shall not be affected by the failure either to petition or to seek reconsideration of a petition filed pursuant to Section 11340.7 before the agency promulgating the regulation or order of repeal. The regulation or order of repeal may be declared to be invalid for a substantial failure to comply with this chapter, or, in the case of an emergency regulation or order of repeal, upon the ground that the facts recited in the finding of emergency prepared pursuant to subdivision (b) of Section 11346.1 do not constitute an emergency within the provisions of Section 11346.1.

My question is could this apply to SB 670, or is this only for State dept regs.

Because as I read this, and think of why sb670 was classified as an emergency law without proper justification or scientific evidence.

Anyway this is an interesting read.

goldfinds

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-20-09, 08:30 PM (MDT)

50. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #49

LAST EDITED ON 11-20-09 AT 08:30 PM (MDT)

SB 670 was passed an "urgency" legislation, which made it go into effect the day it was signed into effect.
Rather than at the end of the fiscal year.

So, I am not sure, if "emergency" applies.

However, the CEQA events unfolding do come under the APA.
As well as any regulation DFG puts into effect.

Some of which is "bizarre", to say the least.
Not to mention "not in accordance with law"

_____
Fish and Game Code section 5653, subdivision (d). This provision of the Fish and Game Code makes it illegal to possess a vacuum or suction dredge in areas, or in or within 100 yards of waters that are closed to the use of vacuum or suction dredges.
_____

All waterways in the whole state are closed. Meaning, you are subject to citation, fine, even arrest if you even transport a suction dredge on any road, highway or interstate freeway next to any waterway in California.

That illegally effects your right of free movement & "Commerce" statewide.

These bureaucrats have simply lost their minds.

In early December, I plan to test this law personally.

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-20-09, 10:03 PM (MDT)

51. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #50

The Federal environmental impact standard on public domain lands, consisting of 45% of California. Is to prevent "unnecessary or undue degradation" of public lands by operations authorized by the mining laws. This long standing, and well thought out environmental impact standard is based on common sense, practicality, and indisputable physical facts.

No natural mineral resource deposit exists, in tidy packages, in orderly stacks, on a shipping platform, waiting to be found, and hauled away. They exist in nature, in whatever setting they exist in. All mineral deposits requiring mining, in order to extract the valuable mineral there.

Given that obvious irrefutable fact, some environmental degradation must take place, in order to mine a natural mineral resource. The cornerstone of all federal regulation governing those environmental impacts, caused by mining is carefully premised on that factual foundation. Otherwise, it would be impossible to mine any natural mineral resource.

The federal standard is not "NO" degradation. Rather, it is to prevent "unnecessary or undue degradation" in mining operations on federal lands. Plainly, if a "NO" environmental degradation standard existed, for agriculture, manufacturing, commerce, and power production. Modern civilization as we know it in America, or California could not exist.

If a "NO" environmental degradation standard is established here, for small scale suction dredge gold mining in California. A "precedent" is set, for all other uses of water, land, agriculture, manufacturing, travel and commerce statewide. Perhaps, if the legislature were to go without everything that mining fundamentally provides them with.

After a day of setting naked, cold, hungry, without shelter, or every other modern necessity, or convenience mined mineral resources make possible. The legislature might come to the full realization of how foolish, arbitrary & idiotic SB 670 actually is. What next, stop limestone, or aggregate mining in California, destroying the states domestic production of cement, and concrete?

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OLD GOLD MINER
Member since 11-15-09
81 posts
11-21-09, 02:32 AM (MDT)

52. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #51

_____
SB 670
The people of the State of California do enact as follows:

SECTION 1. Section 5653.1 is added to the Fish and Game Code, to read:

5653.1. (a) The issuance of permits to operate vacuum or suction dredge equipment is a project pursuant to the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) and permits may only be issued, and vacuum or suction dredge mining may only occur as authorized by any existing permit, if the department has caused to be prepared, and certified the completion of, an environmental impact report for the project pursuant to the court order and consent judgment entered in the case of Karuk Tribe of California et al. v. California Department of Fish and Game et al., Alameda County Superior Court Case No. RG 05211597.

(B) Notwithstanding Section 5653, the use of any vacuum or suction dredge equipment in any river, stream, or lake of this state is prohibited until the director certifies to the Secretary of State that all of the following have occurred..."

1. The puzzle there being, Karuk tribe v. CDFG court order only covers the Klamath, Salmon & Scott rivers.

2. The next puzzle is why SB 670 prohibits suction dredging statewide, when the court order it cites to be complied with only covers the Klamath, Salmon & Scott rivers.

As such, no statewide EIR is required by SB 670.
Consequently, CDFG has no statutory, or regulatory authorization, or authority to perform a statewide EIR.

_____

CEQA § 21080. Division application to discretionary projects; nonapplication; negative declarations; environmental impact report preparation

"(a) Except as otherwise provided in this division, this division shall apply to discretionary projects proposed to be carried out or approved by public agencies...".
(B) This division does not apply to any of the following activities:
(1) Ministerial projects proposed to be carried out or approved by public agencies.

_____

CEQA only applies to "Discretionary" projects.

SB 670 provisions declare the issuance of suction dredge permits is a CEQA "Project".
Consequently, removing any "discretion" CDFG has in the matter.

With all "discretion" removed, the project is made "Ministerial".
That being the case, having no discretion to do otherwise.
CDFG has no authority to perform an EIR under CEQA, and "Must" approve the project permits.

This is a perfect example of mutually incompatible statutory directives.

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-21-09, 06:14 AM (MDT)

53. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #52

LAST EDITED ON 11-21-09 AT 06:21 AM (MDT)

http://www.consrv.ca.gov/smgb/Regulations/Documents/mou%2092.pdf

READ THIS ONE.
THIS THROWS A KINK IN CDFG's CEQA PARTY
IT'S NOT THEIR WAY OR NO WAY.....ANYMORE

(suggest you save a pdf copy, in case this link goes away)

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russau
Member since 7-9-03
4929 posts
11-21-09, 06:21 AM (MDT)

54. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #53

the 92pdf isnt attached to the link.

russau

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OLD GOLD MINER
Member since 11-15-09
81 posts
11-21-09, 06:57 AM (MDT)

55. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #54

I fixed it.
it should work now.

http://www.consrv.ca.gov/smgb/Regulations/Documents/mou%2092.pdf

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Goldfinds
Member since 8-24-09
6 posts
11-22-09, 02:18 PM (MDT)

56. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #0

LAST EDITED ON 11-22-09 AT 02:18 PM (MDT)

Thousands of Salmon are killed every year in California rivers and streams.

http://www.redding.com/news/2009/nov/08/are-gill-nets-decimating-klamath-and-trinity/

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El Dorado
Member since 3-18-09
84 posts
11-22-09, 04:39 PM (MDT)

57. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #56

"Allie Hostler, the Hoopa Valley Tribe's spokeswoman, said her tribe aims to protect the fish on the Trinity and American Indian gill netters are unfairly targeted."
I get it killing them by the thousands to sell to SF fish markets is a good way tp protect these fish while no dredger has ever killed a Salmon. And dredgers are bad..... makes sense if your IQ is less then 70

Steve Wandt
www.naturalgoldjewelry.com

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OLD GOLD MINER
Member since 11-15-09
81 posts

11-22-09, 08:01 PM (MDT)

58. "RE: CALIFORNIA SUCTION DREDGE BAN SB 670"
In response to message #57

THIS IS DATED JUNE 2009

Impart it is Federally FUNDED & covers USFS/BLM lands.
When federally funded, they must include & deal with federal mining law.

They IGNORE federal mandates of the mining laws.
They IGNORE vested private property rights (including riparian & in-stream water rights) of all placer mining claim owners situated in the Klamath river basin drainage.
_____

State Water Resources Control Board

http://epa.gov/region09/water/tmdl/klamath/Chapter6implementationPlan.pdf
_____

6.5.3.3 Coordination with the Department of Fish and Game
The California Department of Fish and Game (CDFG) administers a permit for suction dredging activities in the Klamath River basin. In May 2009, the State Senate passed a bill (SB 670) requiring the CDFG to temporarily halt issuance of all suction dredge mining permits. Senate Bill 670 prohibits the use of suction dredge mining equipment in rivers and streams that provide critical habitat to spawning salmon and steelhead until the CDFG updates its suction dredge rules so they comply with CEQA. The State Water Board currently working cooperatively with the CDFG to formulate general statewide regulations and/or guidelines for dredge operators. The Klamath River TMDL implementation plan supports this process as the means to address the impacts of suction dredging activities, and Regional Water Board staff recommends that CDFG incorporate the prohibition on sediment discharges in and around known thermal refugia locations into the revised permit. Regional Water Board staff will evaluate the revised permit and will consider at that time whether any further measures are necessary to protect water quality. If the permit is sufficient, the Regional Water Board may certify CDFG's program pursuant to the State NPS Policy.
6.5.4

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SUCTION DREDGE PERMITTING PROGRAM
Subsequent EIR - CEQA Scoping Comment Form

Name: RUSS ZAILAR

Mailing Address: BOX 72

GOODYEARS BAR, CA. 95944

Telephone No. (optional):

Email (optional):

Comments/Issues: SUCTION DREDGING: I've been DREDGING FOR MANY YEARS, I CAN'T EVER REMEMBER OF KILLING OR HARMING FISH OR OTHER WILDLIFE. FISHERMAN KILL FISH, I SEE DEAD FISH FLOATING DOWN RIVER ALL SUMMER LONG, WITH HOOK LINE AND SINKER, STILL IN THE FISHES MOUTH. WATER SNAKES KILL MANY FISH, I SEE IT ALL THE TIME. AS FOR MERCURY AND OTHER HEAVY METALS (LEAD, COPPER, STEEL AND OTHER SCRAP), ALL THESE METALS INCLUDING LIQUID MERCURY AND GOLD END UP IN THE FRONT OF MY SLUICE BOX, WHEN I CLEAN THE SLUICE BOX OUT EVERY DAY, I SALVAGE AND RECYCLE ALL THESE MATERIALS. I USUALLY DREDGE A 20' X 60' FOOT SECTION OF RIVER DURING THE SUMMER AND THERE AREN'T ANY HEAVY METALS LEFT IN THE RIVER DOWN TO BEDROCK WHEN I AM DONE WITH IT. THE FACT IS I PAY FISH & GAME FOR A PERMIT TO DO THIS SERVICE. COMMON SENSE WOULD THINK FISH & GAME AND FOREST SERVICE WOULD BE APPRECIATIVE OF THIS. PLUS THE FACT THAT I PICK UP GARBAGE THAT FISHERMAN, HIKERS AND RIVER VISITORS LEAVE BEHIND.

Please use additional sheets if necessary.

Russ Zailar
A "DREDGER"

SUBMIT WRITTEN COMMENTS (POSTMARKED BY 12/03/09) TO:

Mail: Mark Stopher
California Department of Fish and Game
601 Locust Street
Redding, CA 96001

Email: dfgsuctiondredge@dfg.ca.gov

Website: www.dfg.ca.gov/suctiondredge

Questions? Please call us at (530) 225-2275

Ryck Rowan
1227 W. Shannon Ave.
Spokane, Wa. 99205

Mark Stopher
California Department of Fish and Game
601 Locus Street
Redding, Ca. 96001

Dear Mark Stopher,

Sometimes others say it best. Modern Prospecting By Reggie Gould," Lost Treasure Magazine" January 2010.

"Three thousand five hundred dredgers with dredges six inch in diameter or smaller for the whole State of California are a threat to the salmon population, but the commercial dredges that move thousands of cubic yards of material are okay? Apparently it's okay for these giant dredges to kill tens of thousands of fish with giant dredges as long as it done for the infrastructure."

"Now these types of commercial dredges are huge moving thousands of gallons of water, sucking up fish right and left and turning the water to chocolate brown for miles. It's appararently okay if it's for commerce."

"The Fish and Game has stated it is most likely that the Salmon are disappearing in the ocean."

"Anyone who has dredged knows that the venturi jet system does not harm fish in any way, but the environmentalists groups that have been lobbying for this type of bills for years"

"As an example, the suction hose used on a dredge is almost exactly the same type tube used as the Fish and Game when stocking trout into the streams and rivers."

"In 1870, the Federal Government passed the 1870 Mining Law that gave gold miners certain mining rights for their protection."

"AB 670 is in direct contradiction to the 1870 Mining Law and as soon as it is challenged in court the Federal Law will over ride the State Law (LT) "

My opinion, The gold dredgers are few in number. They are highly regulated with costly out of state permits. It is your waters, but the National Forests road systems. Your rules F&G, but the BLM minerals. This is all done according to the Code of Federal Regulations.

So why is it that a small group of people throw a monkey wrench into the works fouling up business as usual.

This is a tightly run organization (DFG) now controlled by the whims of a environmental group? I hope not!

Question Lies in waiting, now a new survey, what is really the next step? Is there a reformat of departmental protocall that meets the strictest of examination or what is due the only action taken?

Sincerly, Ryck Rowan

Ryck Rowan

A person of interest
Holding a 2009
Out of state
Gold Dredging Permit