

December 13, 2007

Rebecca Fitzgerald
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Subject: Comments on Workplan to Control Excess Sediment

Dear Ms. Fitzgerald,

The Karuk Tribe recognizes that controlling excess sediment is a key issue to restore fisheries, protect Tribal Trust species, and improve the health of the Klamath River Watershed. The Department of Natural Resources is dedicated to reducing sediment in the Klamath Basin and takes an active role in both restoration activities and monitoring. Tribal staff participates in meetings, conferences, and stakeholder groups that deal with the issue of sediment. Our Watershed Restoration Program is dedicated primarily to decommissioning roads, which has kept over 361,000 cubic yards of sediment out of tributaries and the Klamath River. Our Water Quality Program is active in monitoring turbidity and suspended sediment in tributaries and the Klamath River.

The following written technical comments are in addition to those presented at the Water Board Meeting held in Eureka, CA, on Dec. 6, 2007 by Susan Corum, Karuk Tribal Water Quality Coordinator.

Sincerely,

Sandi R. Tripp

Sandi R. Tripp
Director of Natural Resources
and Environmental Policy
Karuk Tribe

- **Attachments**

Comments on Workplan to Control Excess Sediment

Karuk Tribe of California
December 13, 2007

History: Need for this Program

There is a well documented history of sediment pollution in the Klamath River and its tributaries and recognition that sedimentation is a major limiting factor for salmon and steelhead growth and survival (Coots, 1967; Coats and Miller, 1981; CH2M Hill, 1985; Kier Associates, 1991; 1999; Pacific Watershed Associates, 1994). The major, chronic source of sediment identified is industrial logging and logging road failure. Similar widespread landscape disturbance in other North Coast watersheds has contributed to the precipitous decline of Pacific salmon (Higgins et al., 1992) and ultimately to the need to list various stocks as threatened and endangered under the federal and State Endangered Species acts (NMFS, 2004; 2005; CDFG, 2002).

The State Water Resources Control Board recognized many watersheds as impaired by sediment beginning in 1988. Several years later, after little remedial action had occurred, the Pacific Coast Federation of Fishermen and others sued the U.S. Environmental Protection Agency to force remedial action.

In 1997 the Federal Ninth Circuit District Court issued a Consent Decree that forced Total Maximum Daily Load (TMDL) studies, in order to begin the process of pollution abatement. These studies have identified sources of pollution and have set limits for load allocations. Unfortunately only the Garcia River basin (U.S. EPA, 1998a) has an enforceable implementation plan in place. Sediment pollution remains pervasive in the Klamath-Trinity basin. Immediate action is needed. This *Work Plan* will help reduce sediment pollution in the Klamath River basin and thereby allow fisheries recovery.

Summary of Comments

The Water Board staff is to be commended for crafting this comprehensive strategy for abating sediment pollution in the region. The *Work Plan* lists 33 region-wide steps and would begin with education, working cooperatively with land owners through diverse processes, and it would ultimately resort to “progressive enforcement” with non-cooperative polluters.

Cooperative efforts include Waste Discharge Requirements or waivers, 401 permits, 1600 permits, storm water permits, construction permits and timber harvest permit oversight. In addition, the *Work Plan* cites completed sediment TMDLs and lists specific actions to control sediment within them.

The plan envisions greater work with counties on General Plan updates and creation of grading ordinances to stem sediment pollution, two very worthwhile initiatives. Cooperative efforts with cities will center on stormwater plans and building permits. Other innovative approaches in the *Work Plan* include a ground and aerial reconnaissance of road failures and landslides after major storm events and the formation of a storm and sediment response team.

The *Work Plan* appropriately calls for the hiring of 19.5 additional staff, including a sediment prevention specialist, and increased training for existing staff in sediment prevention.

The *Work Plan* also notes that the Water Board staff is developing a complementary *Stream and Wetland Systems Protection Policy* that will eventually become an amendment to the *Basin Plan* (NCRWQCB, 2006). The policy is aimed not only at streamside and wetland protection but also at watershed hydrology, including “infiltration capacity, stream channel equilibrium, and floodplain connectivity.”

Dunn et al. (2001) point out that widespread landscape disturbances create cumulative effects that alter not just sediment flux but also peak flows and base flows, which then have profound effects on stream channels and their biota. To truly abate water quality problems and prevent damage to fish habitat, both sediment and hydrologic perturbations need to be addressed in the near term. Adoption and implementation of both sediment control and riparian and wetland protection measures could improve cost-efficiency, if new staff were trained to deal with both sets of issues. Separate public outreach envisioned for each of these initiatives could also be combined, if the riparian and wetland policy were implemented in the near future.

The priority for ranking sediment control in the various impaired watersheds is derived from Bradbury et al. (1994) and includes Pacific salmon species diversity and extinction risk considerations. There are several large Klamath River sub-basins, which despite having substantial sediment impacts, are not listed as sediment impaired (Higgins, 2005; 2006).

The Karuk Tribe hopes that region-wide strategies put forward for sediment control can be implemented as a priority in such sub-basins as the Salmon River, Lower Klamath and Middle Klamath because of their potential fisheries productivity. The protection and restoration of these waterbodies are needed to avoid further loss of salmon and steelhead stocks and protect all Tribal Trust aquatic species.

Conduct Outreach and Education

The *Work Plan* has a practical and logical outreach strategy that could be a key in achieving sediment reduction goals. The program would involve everything from workshops and field trips to newsletters and videos. It will target all counties with recognized sediment problems, their Resource Conservation Districts, and land owners of different practice types (vineyards, timber, rural residential). Education is essential for

getting the public, the agencies and other government entities working cooperatively with the Water Board.

The *Work Plan* also recommends publishing press releases concerning significant enforcement actions, which is also needed to get the public aware and in compliance with practices that lessen sediment discharges.

Progressive Enforcement

It is refreshing and reassuring to see that the *Work Plan* includes discussion of enforcement as part of the sediment reduction strategy. The State Water Resources Control Board (2002) defines progressive enforcement as:

“Progressive enforcement is an escalating series of actions that allows for the efficient and effective use of enforcement resources to: 1) assist cooperative dischargers in achieving compliance; 2) compel compliance for repeat violations and recalcitrant violators; and 3) provide a disincentive for noncompliance.”

Chronic problems with sediment pollution in the Klamath River (Kier Assoc., 1991; 1999) make increased enforcement warranted.

Waste Discharge Requirements and Conditional Waivers

The recognized authority of the Water Board to regulate waste discharges, including sediment, provides a powerful potential tool for gaining compliance with Basin Plan objectives and abating sediment pollution. The *Work Plan* defines the Waste Discharge Requirement (WDR) process as follows:

“The general WDRs and conditional waiver should include an inventory of excess sediment sites, a priority list, a schedule for the repair of sites, a description of practices to repair existing sites, a description of practices to prevent future discharges, a monitoring program, and adaptive management.”

The (WDR) process needs to consider, however, setting limits to disturbance to prevent sediment discharge and damaging changes to watershed hydrology attributable to cumulative watershed effects (Ligon et al., 1999; Dunne et al., 2001; Collison et al., 2003). Even if each new segment of road is engineered to be hydrologically disconnected from streams and even if BMPs are followed on each individual timber harvests, sediment yield can still be greatly increased through cumulative effects. Increased peak flows, for example, can trigger downstream inner gorge failure that produce tons of sediment and reduce fish habitat quality and complexity severely for decades (Coats and Miller, 1981).

Timber Harvest: Other Tribes have provided comments on the Scott River and Klamath River TMDLs (QVIC, 2006a; 2006b; 2006d; 2007, Yurok, 2006a) detailing significant sediment and cumulative watershed effect problems created by logging and associated

road building. The *Work Plan* does not deal with some critical issues like unstable soil types, rain-on-snow events, landslide risk and prudent risk thresholds for road density, road crossings, and timber harvest. These issues need to be integrated into WDRs or waivers for timber harvest operators or else sediment pollution control will likely be unsuccessful.

Unstable Soils: Poorly consolidated granitic bedrock geology extends from Grass Valley Creek north through the Upper Trinity, Scott Valley and across Beaver Creek into the Middle Klamath basin. Sommarstrom et al. (1990) documented how roads through this terrain had greatly elevated sediment yields. These soils are highly prone to surface erosion and gully deformation when disturbed (Coots, 1967). Over-logged sites become very xeric (dry) with sparse, stunted forests which require a prolonged period for hydrologic recovery, thereby extending the risk of floods (QVIC, 2006a). Consequently, WDRs need to impose strict limitations on timber harvest and road building on unstable soils.

Rain-on-Snow: Previous TMDL comments by Tribes have raised the concern that timber harvest in the transient snow zone may lead to major increases in peak flows (Berris and Harr, 1987; Coffin and Harr, 1991; Jones and Grant, 1996). Increased runoff during rain-on-snow events can trigger landslides and create major negative impacts on downstream stream reaches (Montgomery and Dietrich, 1993). Armentrout et al. (1999) defined the rain-on-snow zone in northern California as the elevation between 3500-5000 feet. Timber harvesting needs to be limited in watersheds where extensive road networks and clear-cutting have previously taken place in the transient snow zone. QVIC (2006a) pointed out that the window of elevated risk for rain-on-snow events is prolonged as tree re-growth is slowed by successive timber harvests.

Landslide Risk: The shallow landslide stability model (SHALSTAB) (Dietrich et al., 1998) provides a landscape-scale screening tool that identifies sensitive areas upon which road building and timber harvest should be limited. Kier Associates (2005) studied debris torrents in the lower west-side Scott River basin caused by the January 1997 storm and found that 80% (231 of 290) of the active landslides intersect with that 7% of the landscape identified as “very high” in risk using the SHALSTAB model.

Lower Klamath tributaries have extremely steep terrain and disturbance of areas at high risk of debris torrents should be avoided (Kier Associates, 1991). WDRs or waivers should include restrictions against intensive logging or road building on SHALSTAB high risk areas.

Road Density: Jones and Harr (1996) note that the hydrologic legacy of roads is much more long lasting than those related to timber harvest, itself. Roads disrupt hillslope hydrology and can lead to both damaging increased flood flows and to a reduction in summer base-flows (Montgomery and Buffington, 1993). The National Marine Fisheries Service (1995) has restrained road densities on federal lands in the Columbia River basin to 2.5 miles (mi.) of road per square mile (mi.²) of watershed. This target for road density is also recognized by the U.S. Forest Service in California (Armentrout et al., 1999; USFS, 2000; 2002; 2003).

WDRs or waivers need to reduce road densities over time to less than 2.5 mi. / mi.² and require road removal from streamside zones and from unstable areas that are likely to trigger mass wasting.

The *Redwood Creek TMDL* (U.S. EPA, 1998b) specifies that “all roads are inspected and maintained annually or decommissioned” and that “roads that are closed, abandoned, or obliterated are hydrologically maintenance free.” Kier Associates (1991) noted abandoned logging roads were a major source of sediment pollution in many Klamath sub-basins and de la Fuente and Elder (1998) found road failure was the largest source of sediment during the January 1997 storm. WDRs need to reduce timberland road networks to a point where they can be actively maintained, so that catastrophic road failures are reduced.

Road Crossings: Multiple crossings of the same stream channel in steep terrain are known as “stacked culverts.” The Klamath National Forest (KNF) 1997 flood study (de la Fuente and Elder, 1998) found that 437 miles of stream channel were scoured and that scour on many reaches was triggered by multiple culvert failures at different locations on the same stream. In a study of Sierra streams, Armentrout et al. (1999) recommended that stream crossings be limited to less than 1.5 per mile of stream to prevent catastrophic failures. WDRs or waivers for timber harvest need to limit the number of stream crossings similar to the recommendation of Armentrout et al. (1999).

Timber Harvest Rates: Ligon et al. (1999) and Dunn et al. (2001) point out that the lack of limits on timber harvest is confounding efforts to control impacts and to protect Pacific salmon in California. Reeves et al. (1993) suggest that a maximum of 25% of a watershed should be harvested over 30 years in order to maintain diverse assemblages of Pacific salmon. Swanson et al. (1998) found major CWE damage from a 1996 storm event to stream channels in the Oregon Cascades in watersheds that were more than 20-30% logged. WDRs should limit the extent of timber harvest in a watershed to no more than 25% over a span of 30 years.

Table 1 shows suggested targets that can be integrated into WDRs in the Klamath Basin and elsewhere on timberlands in north coast watersheds.

Table 1. Upland target conditions needed to minimize cumulative effects risk and to insure recovery of aquatic conditions.

Parameter	Upland Target Conditions	References
Road Densities	<2.5 mi./sq. mi.	USFS (1996), NMFS (1996)
Road-Stream Crossings	<1.5 road crossings per mile of stream	Armentrout et al. (1999)
Timber Harvest	<25% of a watershed in 30 years	Reeves et al. (1993), Swanson et al. (1998)
Unstable areas	No disturbance in SHALSTAB high risk	Dietrich et al. (1998)

	zones w/o geologic review	
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Grazing: The Scott River is scheduled for implementation of grazing WDRs or waivers as part of the TMDL implementation. Although the Shasta River is not recognized for sediment impairment, over-grazing in riparian zones is leading to bank erosion (Kier Associates, 1999) and the reform of grazing practices should be a priority on Big Springs Creek, lower Parks Creek and along the mainstem Shasta River. Grazing problems are also recognized as impairing riparian function on lower Horse Creek, the mainstem Klamath River above Horse Creek, and in Hayfork Creek in the South Fork Trinity River basin (Pacific Watershed Associates, 1994).

Farmlands now occupy most of the low gradient reaches of the Klamath River and its major tributaries. Low gradient reaches are also known as “response” reaches, which were complex stream channels where large wood and spawning gravel would be deposited.

These formerly highly productive salmon and steelhead habitats have become the most profoundly altered. Ultimately, riparian easements that exclude livestock from the streams should be promoted, hopefully in cooperation with local RCDs and the University of California Cooperative Extension (UCCE). These easements would compensate the land owner while allowing retention of the land title, although the streamside protections would run with the land.

The QVIC (2007) recently commented on the Klamath National Forest (KNF) *Kidder Creek and Shackelford Allotments Livestock Grazing Management Environmental Assessment* and noted that grazing activities were degrading both riparian conditions and aquatic habitat. Despite monitoring results indicating continuing degradation, the KNF proposed the continuation of grazing. WDRs for USFS grazing need to require appropriate monitoring and require the practice of adaptive management, which would include stock removal when warranted.

Working with Cities and Counties

Although the Klamath River basin remains largely rural, enhanced cooperation between Water Board staff and municipalities is essential given the steady urbanization taking place in some parts of the North Coast region. Establishing increased communication with county staff is also highly desirable and the investment of Water Board staff time participating in General Plan updates and the crafting of grading ordinances will likely have long lasting sediment pollution reduction benefits.

The need for Siskiyou County to develop a grading ordinance is specifically noted in the Scott River TMDL. Hopefully the Water Board staff will be able to help foster the development of that plan.

Develop and Implement Incentive Program

The availability of grant funds to assist with sediment pollution control is a major tool for private land owners in restoring beneficial uses and preventing soil loss. However, grant funds should not be allocated unless patterns of land use disturbance are improved sufficiently to reduce cumulative effects risk. In other words, increasing the size of culverts or rocking roads should not be funded in a watershed where subsequent timber harvest and additional road building are envisioned and cumulative effects risk is already determined to be high. Collison et al. (2003) point out that the hypothesis that improved road drainage decreases sediment yield has yet to be confirmed by field data.

Storm Damage Reconnaissance and Response

Damage from logging activities and road building occur when triggered by major storm events. The *Work Plan* recognizes the need to perform immediate aerial and ground reconnaissance to assess damage and discover patterns of sediment pollution so that problems can be abated. Formation of a staff storm response team for such follow-up would be a positive step.

Staff Development and Inter-Agency Training

The *Work Plan* outlines tasks and identifies the need for 19.5 staff positions to successfully implement them. The Water Board needs to approve the *Work Plan* and aggressively pursue funding for additional staffing in order to meet Basin Plan objectives and the requirements of the federal Clean Water Act and the Porter-Cologne Act. The addition of an excess sediment control specialist would provide in-house technical expertise that is much needed.

The Work Plan envisions not only training for Water Board staff, but also cross-training for staff of other agencies. This strategy is in keeping with the recommendations of Dunne et al. (2001) and will likely reap substantial benefits concerning sediment pollution abatement over time.

Basin Prioritization Criteria

The method for prioritizing actions is based on the principals outlined in Bradbury et al. (1995). It is both quantitative and transparent. It is appropriate that the number of salmonid species, their relative productivity and the risk of extinction were used as criteria for ranking actions. One major flaw in the ranking results from the exclusion of federal lands from consideration since cleanup and abatement responsibilities on these lands falls to the USFS and BLM. Nonetheless, federal lands within the Klamath basin remain a major source of sediment pollution and the Water Board staff needs to press for cleanup when WDR or waivers are reviewed.

As noted above, only basins listed as sediment impaired are given priority ranking in the *Work Plan*, but it allows flexibility and provides tools to abate problems in non-listed basins.

The Yurok Tribe (2006) and QVIC (2007) have pointed out the extremely important role Middle Klamath tributaries play as cold water refugia for salmon and steelhead juveniles and adults from throughout the basin. The U.S. EPA (2003) notes that the protection of well distributed cold water refugia is essential when a mainstem river is temperature impaired and the remediation of temperature problems is likely to take decades. Consequently, the Water Board should make Middle Klamath basin sediment control and abatement a priority.

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