Sensitive Watershed Nomination

for

Elk River Planning Watersheds
Humboldt County
California

Prepared
By
Staff to the
Regional Water Quality Control Board
North Coast Region

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Introduction and Background

The North Coast Regional Water Quality Control Board (Regional Water Board) proposes to nominate the Elk River watershed in Humboldt County as "sensitive" under Forest Practice Rules. Recommendations to provide additional measures sufficient to protect the natural resources in this watershed include the following:

1) A more refined approach to identifying the relative stability of the working landscape;
2) Linking management measures to the relative stability, reducing the level of disturbance on the areas of greater concern.

During many Regional Water Board meetings between 1997 and the present time, several residents of the Elk River watershed expressed concerns about the water quality impacts of timber harvesting on fisheries, domestic water supply and local flooding. Their primary focus was on the timber harvesting conducted by The Pacific Lumber Company (Pacific Lumber) and the rate of timber harvesting occurring in the watersheds. In December 1997, the Regional Water Board added Elk River to the 303(d) list of impaired waterbodies due to excess sediment affecting the beneficial uses of water.

The logging history of the Elk River watershed is similar to many watersheds in the near-Humboldt Bay area. Railroads were built up the bottom of the major streams and logs were skidded to downhill landings by animals or steam donkeys. Most of the old growth timber was completely logged by the 1940s when tractor logging and truck hauling was the primary method. The early logging had little regard for protection of streams from sedimentation. Since the enactment of the Forest Practices Act, an effort has been made to construct roads on midslopes and ridges to utilize cable yarding methods which are less damaging than tractor yarding. The main truck haul road still remains adjacent to the main stem North Fork Elk River. The watershed is dominated by second and third growth redwood and Douglas fir timber in the 50 to 60 year age class except where it has been recently logged.

In 1999, the Headwaters Reserve purchase was completed, and the headwaters of the South Fork of Elk River now is predominantly public lands. The North Fork Elk River remains predominately owned by Pacific Lumber. Several other landowners hold timberlands in the lower portion of the watershed.

After an interim period in the later 1990s when harvesting was suspended in much of the watershed, Pacific Lumber commenced harvesting under a new Habitat Conservation Plan and Sustained Yield Plan, documents which had been approved by various agencies of the state and federal governments. Litigation has been filed over the adequacy of these documents, and such litigation continues to this day.

In 1999 and 2000, residents and others in the watershed formally requested that the Regional Water Board take action to control the discharges causing excessive sedimentation and flooding in the watershed (as well as four other watersheds). After commencing the process for holding adjudicatory hearings to address the issues in the watersheds, the Regional Water Board postponed then ultimately cancelled its schedule of hearings in 2001.

On March 2, 2001, and on May 8, 2002, the State Water Resources Control Board (State Water Board) received petitions, filed by the Humboldt Watershed Council, Jesse Noell, and Ken Miller (Petitioners). The March 2, 2001 petition asked the State Water Board to review the lack of action by the North Coast Regional Water Quality Control Board (Regional Water Board) on Petitioners' previous petition dated April 17, 2000, that requested action against Pacific Lumber for alleged improper logging practices in the Freshwater Creek and Elk River watersheds. The May 8, 2002 petition asked the State Water Board to direct the Regional Water Board to: (1) require Pacific Lumber to submit reports of waste discharge for all logging operations in the Freshwater Creek, Elk River, Stitz Creek, Bear Creek and Jordan Creek drainages; and (2) to issue waste discharge requirements corresponding to each of those waste discharge reports.

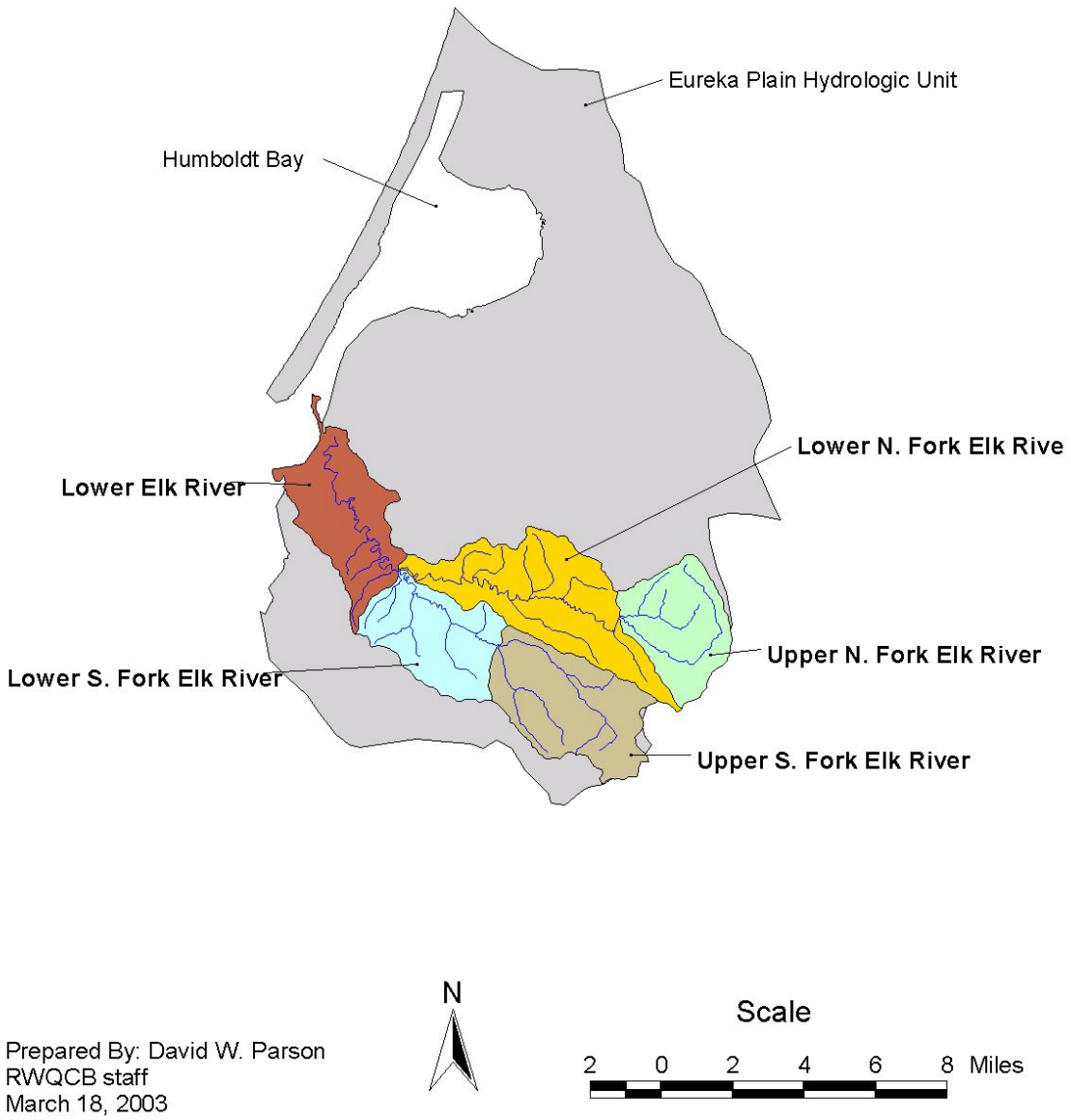
On January 23, 2002, in response to the March 2, 2001 petition, the State Water Board issued Order No. WQO 2002-0004, which remanded the issues contained in the petition back to the Regional Water Board. In response to the May 8, 2002 petition, the State Water Board in October 2002 issued WQO 2002-0019 ordering the Regional Water Board to continue to take action to address water quality problems within the five watersheds, that the actions to protect water quality from potential adverse effects to beneficial uses of water shall include requiring reports of waste discharge and issuance of waste discharge requirements, as appropriate, and to provide periodic progress reports to the State Water Board.

Throughout 2002, numerous Regional Water Board meetings and hearings were conducted to address the issues surrounding the two petitions. Regional Water Board and staff actions have included issuance of waste discharge requirements, issuance of a cleanup and abatement order, establishment of several monitoring programs and agreements, acceleration of Total Maximum Daily Load development, and convening of the Humboldt Watersheds Independent Science Review Panel (ISRP), to name a few.

On January 24, 2003, the Regional Water Board directed the staff to prepare information to support Sensitive Watershed Nominations under the California Forest Practice Rules (FPR) section 916.8 for five watersheds in Humboldt County. The five watersheds are Elk River and Freshwater, Jordan, Bear and Stitz Creeks. These five watersheds are all differing sizes, and sub-basins "planning watersheds" have been developed for use in the FPR section 916.8 process.

Elk River was selected as the first watershed for development of information to support nomination as a sensitive watershed, and this document assembles the information for five sub-basin "planning watersheds" within the Elk River drainage. The five planning watersheds are Upper South Fork Elk River, Upper North Fork Elk River, Lower North Fork Elk River, Lower South Fork Elk River and Lower Elk River, all located within the Eureka Plain Hydrologic Unit in Humboldt County, California. Figure 1 shows the locations of the five Elk River planning watersheds, their relationship to the Eureka Plain Hydrologic Unit in which they reside, and their primary drainages that ultimately discharge to Humboldt Bay.

Figure 1. Elk River Planning Watersheds nominated for Sensitive Watershed Designation



The five Elk River planning watersheds are proposed for submittal to the Board of Forestry and Fire Protection (BOF) as a combined-package because of their spatial proximity, similar characteristics, level of adverse cumulative impacts and the continuing timber harvest activities. The grouping of the five planning watersheds is consistent with requirements of FPR section 916.8, which specifies that nominations need to be on a planning watershed scale. These five

sub-basins are based on the Calwater v2.2 planning watersheds. Calwater planning watersheds were developed by the California Department of Forestry and Fire Protection for use in timber harvest planning and review.

This report will evaluate five Elk River planning watersheds, and provide the needed supporting information regarding the "sensitivity" of the watershed[1].

The Elk River drainage is listed as impaired for sediment as defined under Section 303(d) of the Federal Clean Water Act (CWA) and as such is extremely sensitive to additional sediment discharges from land management activities that may cause further impairment. It has been documented by multiple state agencies that the Elk River is also "significantly cumulatively impacted" as a result of historic land management activities. These documented impacts include but are not limited to loss of domestic water supplies, increased frequency and magnitude of flooding, loss of aquatic habitat, and overall decline in anadromous salmonid species.

Multiple landowners exist within the entire Elk River watershed, but the predominant upland timber harvesting landowner is Pacific Lumber. Given the location of Pacific Lumber's landholdings and the effects of downstream flooding, the California Department of Forestry and Fire Protection (CDF) has established a rate of harvest within the Elk River watershed for Pacific Lumber. The established rate is 600 clear-cut equivalent acres per year. This rate was established with the rationale of not worsening the current flooding conditions due to increased water volume. While no agreement among agency and scientific personnel yet exists on the analysis used to establish this level (or any other particular level) of harvesting, the need for some limit has been established. A link between increased peak flows following canopy removal and sedimentation from debris landslide, scour of sediment-laden channels, bank erosion, and torrent track scour has been demonstrated.

Using methodology outlined in *The Review of Freshwater Flooding Analysis Summary (*Lisle, et. al., 2000b, 2000c), Regional Water Board staff conducted similar analyses (White, 2002), incorporating silviculture and road related sediment inputs and cumulative stream channel aggradation. Staff's analysis of the data reveals that the recovery period for the watershed is strongly influenced by the magnitude of the existing sediment load and any new sediment inputs. In evaluating increased flooding, staff found that the 2001 flood severity is 135 % greater when compared to the 1997 watershed conditions, a time when the sediment impairment was already sufficiently serious to have resulted in 303(d) listing. Conditions have degraded, and staff's analysis further indicates that conditions will continue to degrade, with watershed recovery delayed until 2007, assuming all sediment inputs were immediately abated. If such sediment inputs are not sufficiently abated, then the watershed will not recover in the foreseeable future.

[1] The FPRs do not define sensitivity as it pertains to any planning watershed. The American Heritage Dictionary (1982) provides some definition in this regard with *sensitive* meaning receptor responsiveness to external conditions. This general definition could be more refined to include sensitivity of the landscape to land management conditions. Because the Regional Water Board's regulatory mandate is for protection of water quality, the definition could be further refined to sensitivity of the landscape and watercourses (as receptors) to land management activities. This latter definition is appropriate because the landscape (geology, soils, etc.) has differing spatial sensitivities to different types of land management activities.

Sediment inputs related to landslide events triggered by human activities have affected the Elk River watershed. To address these events, staff has proposed an approach for regulating timber harvest activities described in this nomination package can be characterized as a site-specific, progressive method. The first step is to determine the stability of the land areas proposed for management activities. Protection measures are then matched to the land areas based on the land areas' stability. As the land stability decreases, the level or extent of the investigation and/or protection measures increase.

The staff approach involves dividing the landscape into three general categories of land stability: stable, metastable, and unstable. Stable lands are those areas that have a low probability to result in a sediment discharge to a watercourse as a result of land management activities. Unstable lands are those areas that have a high to extreme probability of a sediment discharge to a watercourse as a result of land management activities. Metastable lands are those areas not classified as stable or unstable because of insufficient information.

Inherent in these definitions is the concept of not just slope stability, but is driven by the risk to water quality. For example, there could be an active landslide feature, which on its face, might be viewed as "unstable." However, if the active landslide feature were on a ridge top, with a low probability of discharging sediment to a watercourse affecting beneficial uses, then the resulting classification would be "stable," for purposes of water quality protection.

Once the landscape stability classification is determined for a given land area, appropriate protection measures can be evaluated for that particular land area. Staff has developed proposed protection measures per section 916.8(a)(6) that are progressive relative to the stability of the given land area. As the stability goes from stable to unstable, the level or extent of the protection measures increase. For stable areas the current Forest Practice Rules (FPRs) and Pacific Lumber's Habitat Conservation Plan (HCP) prescriptions would be appropriate protection measures. For unstable areas avoidance of land management activities is recommended. Lands classified as metastable require a more refined approach.

For metastable land areas, the allowable level of management activity is dependent upon the knowledge of the land area and consequence(s) of the proposed management activity. Metastable areas inherently have uncertainty due to lack of knowledge of their response to land management and the risk to the receptor. As knowledge of the metastable areas is gained through characterization efforts, uncertainty is reduced. If characterization and protective measures reduce uncertainty and risk to below acceptable thresholds, then management activities may proceed.

If too much uncertainty remains on the metastable areas then a recalculated rate of harvest limitation may be necessary to approve harvesting in those areas. A rate of harvest limitation would be based upon the best available information of landscape response to land management and the condition of the receptor, in this case, beneficial uses of water quality.

The procedure for determining an acceptable rate of harvest for metastable lands is generally as follows:

1. Determine overall sediment generation rates for the following erosion categories: landslides, bank erosion, and scour of low order channels, and road-related erosion. Sediment generation rates need to be determined over a sufficient time-scale which would include a triggering storm event.
2. Over the same time scale, refine the overall sediment generation rate based on managed and unmanaged lands within each erosion category.
3. For each erosion category, determine the relative differences for the sediment generation rates for managed and unmanaged lands.
4. Consider the relative differences in these rates and an allowable threshold of sediment input to the receptor, then determine the total maximum area that may be disturbed in any given time period to maintain sediment levels below the allowable threshold.
5. Adjust the rate of harvest, if appropriate, as additional information is developed.

Section 1.0 Watershed Name, Size and Location

Table 1 provides the watershed specific information required for the five planning watersheds located in the Elk River watershed and proposed for sensitive watershed nomination. Elk River is located in northwestern Humboldt County, California. These planning watersheds are illustrated in Figure 1 and together comprise approximately 34,000 acres in the Elk River watershed.

Section 2.0 Watershed Tributary Name

The five nominated planning watersheds are tributary to Elk River, which is tributary to southern Humboldt Bay.

Section 3.0 Specific Resources Significantly Threatened by Future Timber Operations

The specific resources that are significantly threatened by future timber operations in the Elk River watershed described in this nomination package per FPR section 916(a)(3) include (a) fish, aquatic organisms, aquatic habitat, and riparian habitat; (b) domestic water supplies and other beneficial uses of water; (c) factors related to the stream channel and morphology; (d) downstream reservoirs, navigable channels, and harbors; and (e) wildlife species and habitat for rare, threatened, and endangered species.

Table 1. Watershed Name, Size and Location

Planning Watershed Name (Calwater V2.2)	Size (acres)	County	Township and Range	USGS Topographic Name	Planning Watershed ID (Calwater V2.2)
Lower North Fork Elk River	9,077	Humboldt	T4N, R1E T4N, R1W T3N, R2E T3N, R1E	McWhinney Creek and Fields Landing	1110.000201
Upper North Fork Elk River	5,358	Humboldt	T4N, R1E T2N, R2E T3N, R1E T3N, R2E	McWhinney Creek and Iaqua Buttes	1110.000202
Lower South Fork Elk River	5,692	Humboldt	T4N, R1E T4N, R1W T3N, R1E T3N, R1W	McWhinney Creek and Fields Landing	1110.000302
Upper South Fork Elk River	7,492	Humboldt	T4N, R1E T3N, R1E	McWhinney Creek	1110.000301
Lower Elk River	6,224	Humboldt	T4N, R1W T3N, R1W	Fields Landing	1110.000402

3.A Fish, Aquatic Organisms, Aquatic Habitat, and Riparian Habitat

The Elk River watershed historically has provided habitat for populations of anadromous coho salmon *(Ohncorhynchus kisutch)*, chinook salmon *(Oncorhynchus tshawytscha)*, steelhead trout *(Oncorhynchus ykiss*), and resident cutthroat trout (*Ohncorhynchus clarki clarki)*. Additionally, Elk River provides habitat for amphibians, including red and yellow-legged frogs, pond turtles, southern torrent salamanders, and pacific giant salamanders. The California Department of Fish and Game (DFG) North Coast Watershed Improvement Center has conducted fisheries inventory stream surveys in numerous tributaries of the Elk River. These surveys document the extent of these beneficial uses. Appendix A contains summaries of the fish and habitat surveys conducted in these Elk River tributaries

Adverse effects associated with an increase in sediment in fish habitat is well documented and includes redd failure, reduced survival of eggs to hatching and emergence, reduced or eliminated spawning substrate, pool filling resulting in reduced rearing area and complexity, chronic turbidity impairing feeding and resulting in increased stress and other health problems, as well as a reduction in aquatic benthic macro-invertebrate production.

Filled pools, embedded cobbles, and other sediment depositional impacts compromises the necessary riparian structural components as well as limits the diversity of plant life conducive to healthy ecosystems for reptile and amphibian reproduction, development, and growth.

3.B Domestic Water Supplies and Other Beneficial Uses or Factors Related to the Stream Channel and Morphology

Beneficial uses of water for the Elk River and its tributaries include municipal and domestic water supply, agricultural supply, industrial process supply, industrial service supply, groundwater recharge, navigation, water contact recreation, non-contact water recreation, commercial and sport fishing, warm freshwater habitat, cold freshwater habitat, wildlife habitat, and rare, threatened, or endangered species. Residents in the North Fork, South Fork, and Mainstem Elk River have historically used surface water for domestic and agricultural water supplies. As a result of the logging-related effects on the drinking water beneficial use, the Regional Water Board ordered Pacific Lumber to provide alternative water systems to twelve residences along North Fork Elk River (Order No. 98-100).

Sedimentation and discharge of earthen material from timber operations has significantly modified the channel flow conditions of Elk River and its tributaries such that a threat to public health and safety and property is present from increased incidences and magnitude of routine flooding.

3.C Downstream Reservoirs, Navigable Channels, Harbors

Elk River is the largest freshwater tributary to Humboldt Bay. Humboldt Bay is the largest shipping port in California north of San Francisco Bay. The harbor is used for recreation and industry. The Humboldt Bay Harbor District manages harbor use and recently dredged the Humboldt Bay to allow access for large ships. Re-dredging could be necessary if accelerated sediment inputs persist.

3.D Wildlife Species and Habitat for Rare, Threatened or Endangered Species

State and federally listed aquatic species in the Elk River watershed include:

- Chinook – state and federally listed as threatened,
- Coho – state candidate species, federally listed as threatened,
- Steelhead - federally listed as threatened

Adverse effects are similar to those discussed under section 3(A): increases in sediment reduce spawning and rearing success through redd failure, reduced survival of eggs to hatching and emergence, reduced or eliminated spawning substrate, pool filling resulting in reduced rearing area and complexity, chronic turbidity impairing feeding and resulting in increased stress and other health problems, as well as a reduction in availability of food as aquatic benthic macro-invertebrate production is similarly reduced

Section 4.0 Natural or Management Induced Watershed Conditions Which Pose Significant Threat to Resources

The Elk River drainage is listed as impaired for sediment as defined under Section 303(d) of the CWA and as such is extremely sensitive to additional sediment discharges from land management activities that may cause further impairment. It has been documented by multiple state agencies that the Elk River is also "significantly cumulatively impacted" as a result of land management activities. This finding is documented in the Cumulative Watershed Effects Meeting Agency Review of Bear Creek, Jordan Creek, Stitz Creek, Freshwater Creek and Elk River, December 16, 1997 (Appendix B). These documented impacts include but are not limited to loss of domestic water supplies, increased frequency and magnitude of flooding, loss of aquatic habitat, and overall decline in anadromous salmonid species.

Watershed conditions for two of the five Calwater v2.2 planning watersheds located in the Elk River are generally summarized in *Sediment Source Investigation and Sediment Reduction Plan for the North Fork Elk River Watershed*, prepared for Pacific Lumber by Pacific Watershed Associates, (1998) (Appendix C). The investigation describes conditions in both the Lower North Fork and Upper North Fork Elk River planning watersheds.

Watershed conditions for the remaining three planning watersheds are not well summarized in any single document. However, the Pacific Watershed Analysis (PWA) (2001) contained in Appendix D summarizes erosion and sediment delivery for the Upper and Lower South Fork, and portions of Lower Elk River planning watersheds. Instream conditions are documented in DFG habitat surveys, individual timber harvest plans, and agency staff reports (Dudik, 1998, Cafferata, 1997, White, 2003). Further watershed information will be made available through the Regional Water Board's Elk River Total Maximum Daily Load (TMDL) process as well as Pacific Lumber's watershed analysis process.

4.A Steep Slopes and Easily Destabilized Soils

Much of the Elk River watershed encompasses steep, easily destabilized slopes. Approximately 69% of the watershed is underlain by the Wildcat Group, which consists predominantly of marine sandstone, mudstone, and siltstone with minor amounts of river-deposited sandstone. It is a relatively unstable geologic group with high erosion rates. There are five erosion mechanisms that produce nearly all the sediment in the watershed. The five mechanisms are listed in order of the percentage of total sediment delivered to watercourses: debris landslide (55%), scour of sediment-laden channels (18%), road-related erosion (17%), bank erosion (6%), and torrent track scour (4%) (PWA, 1998).

4.B Continuing Landslides or Soil Erosion Related to Past or Ongoing Landuse

Slope angle magnitude and soil type and strength parameters are acknowledged (Sidle, et. al., 1985) as being two of the primary factors affecting slope stability and erosion. Review of *Geology and Geomorphic Features Related to Landsliding* (CGS, 1985) map for the Elk River area shows that they are dominated by a high density of landslides particularly adjacent to

watercourses, where ground is steep, and associated with specific types of landforms such as inner gorges.

Reid (1998) conducted analyses of the results presented in PWA (1998) and found there to a 1300% increase in landslide inputs from harvested versus unharvested areas for the time period of 1994-1997.

A recent Regional Water Board Cleanup and Abatement Order issued to Pacific Lumber requires evaluation of the treatment options for the sites identified in PWA (1998). The following table summarizes some of the findings from the evaluation. Regarding non-road-related landslides, the report did not distinguish natural or management related features.

Table 2. Summary of preliminary findings of CAO No. R1-2002-0114.

	Total slides	Road related	Non-road-related
Number of slides	353	149	204
Fully or Partially Treated	28	28	0
Proposed for Treatment	53	53	0
Percent Treatable	23%	54%	0%
Sediment Delivery	100,000 yd^3		

These summary data suggest that more than 75% of landslides are not treatable and also suggest that applied prevention methods during this time period were inadequate to protect beneficial uses.

4.C Extensive Ground Disturbance, Particularly from Roads, Skid Trails, Crossings, and Landings

The greatest amount of ground disturbance from anthropogenic sources is related to commercial timber operations undertaken in each of the five planning watersheds. These activities typically are harvesting; yarding; road, landing and skid trail construction and reconstruction; log and equipment hauling; and site preparation. As described in Table 2, road-related slides are abundant in North Fork Elk River. At the present time approximately 50% of the failures are categorized as treatable. These sediment sources can affect instream conditions for decades following construction activities.

Pacific Lumber's Sustained Yield Plan (SYP, 1999) provides some relative sensitivity and ground disturbance indicators across their ownership that fall under the purview of their Habitat Conservation Plan (HCP, 1999). These tools could be used as a way to estimate ground disturbance by anthropogenic sources. Under the HCP interim prescription, an upper limit to the disturbance index (DI), as calculated on the hydrologic unit scale, is 20%. If the DI exceeds this threshold, Pacific Lumber shall not implement activities with the highest ground disturbance (i.e., activities of ratings 0.7 or greater in Table 3, below).

Table 3. Relative Disturbance Index Ratings for Timber Management Activities, Pacific Lumber SYP (1999).

Silviculture Practice	Rating	Yarding Method	Rating
Clearcut	1.0	Tractor	1.0
Overstory Removal	0.7	Cable Skyline	0.6
Seed Tree Step	0.7	Tractor & Cable	0.7
Seed Tree Removal	0.7	Salvage	0.7
Shelterwood Prep. Step	0.5	Unknown	0.7
Shelterwood	0.6	Cable Highlead	0.7
Shelterwood Removal	0.7	Helicopter	0.4
Rehabilitation	0.7		
Commercial Thin	0.5		
Selection	0.5		
Transition	0.6		
Alternative	0.5		
Salvage	0.3		

According to proposed THP 1-03-005 HUM, the current Elk River DI is 11.24%. Considering this high level of current disturbance, the documented recent impacts on beneficial uses, and the ongoing cumulative impacts, the HCP index threshold of .7 or greater does not seem to be obtaining the desired result. A lower threshold should be considered.

4.D Accelerated Aggradation, Stream Bank Erosion, and Channel Scouring

Sedimentation and discharge of earthen material from timber operations has significantly impaired water quality and modified channel conditions of Elk River and its tributaries such that many of the historic beneficial uses of water are no longer viable. Further, threats to public health and safety and property from increased flooding conditions occur routinely. As a result of these impairments to beneficial uses, the Regional Water Board ordered Pacific Lumber to provide alternative water systems to twelve residences along North Fork Elk River.

Channel aggradation has been documented in the lower reaches of North Fork, South Fork, and Mainstem Elk River (Dudik, 1998, Cafferata, 1997, O'Connor, 2001, White, 2003, Wrigley, 2003). A longtime resident of Elk River, Kristi Wrigley, documented historic and recent changes to water quality and flooding conditions (Appendix E). As well as contributing to increased flood severity which seriously threatens public health, safety, and property, in-channel sediment accumulation is also impairing beneficial uses of water by degrading and eliminating fish habitat, filling of pools used for domestic and agricultural water supplies, degrading recreation opportunities and aesthetics, among others.

Evidence indicates that sediment aggradation has increased flood frequency and magnitude in Elk River. According to Anderson (2001) and Klein (2001) the primary cause of increased flooding in Elk River is due to channel sedimentation and a reduction in channel cross sectional area.

Lisle et al. (2000a) discuss observations by long-time Elk River residents indicating that the channel was noticeably filling with sediment and degradation of water quality had occurred in the early 1990's. By the time these effects were noticeable, the threshold for aggradation had already been surpassed by sediment inputs.

Regional Water Board staff (Dudik, 1998) conducted interviews of residents who described reduction in substrate size, and silt and clay deposition on stream banks above watercourses, and in shrubs. Residents consistently reported that observed changes in the North Fork Elk River were pronounced between 1991 and 1994. The Regional Water Board staff (2000) summarized the harvest history for North Fork Elk River and show that between 1974 and 1987 the annual harvest rate on Pacific Lumber lands (the primary landowner) increased significantly from 0.5% of their ownership to 3.8% per year between 1987 and 1994.

Regional Water Board staff analyses (White, 2002) indicate the increase in flood frequency and magnitude is most logically a result of the combined effects of increased peak flow volumes and increased sediment aggradation in the channel and on the banks. Regional Water Board staff analyses (White, 2002) indicate that in 1997 there was a 15% increase in the 2-year recurrence interval peak flow compared to background conditions due to canopy removal associated with timber harvesting.

In order to demonstrate the change in channel capacity between current and historic conditions, Regional Water Board staff relied on the review of Conroy (1998) conducted by Lisle et al. (2000a). The review refers to historical data documented by United States Geologic Survey (USGS) and recent data from Conroy (1998) pertaining to the same cross-section at the gage station on the mainstem Elk River just below the confluence of North Fork and South Fork Elk River. The USGS records indicate that between 1959 and 1967 bankfull discharge was 63 cubic meters per second (cms). Conroy indicates that in 1997 bankfull discharge was 25 cms. The historic information indicates the bankfull channel capacity was reduced by 60% between 1967 and 1997.

Using available harvesting and roading history, Regional Water Board staff (White 2002) concluded the change in flood severity was due to aggraded stream channels and increased peak flow volumes. Specifically, in 1997, 85% of the change in flood frequency was attributable to reduction in channel capacity due to aggradation, which had increased by 60% between 1967 and 1997. The remainder of the impact was due to hydrologic changes. Analyses indicate that timber harvest rates approved by CDF, and currently being implemented by Pacific Lumber, would result in continued worsening of flooding conditions, primarily due to stream aggradation.

As hypothesized and observed by Regional Water Board staff (Dudik, 1998 and White, 2003), as recently and historically generated sediment is deposited in low gradient reaches, the effective bankfull stage is elevated at locations farther upstream than historic observations indicate.

O'Connor (2001) conducted a stream channel analyses of the confluence area of North Fork and Mainstem Elk River. Table 4 summarizes information presented in O'Connor (2001) and demonstrates the level of known historic data collection. Documentation indicates agreement that at least six feet of sediment deposited at the gage site between 1964 and 1997.

Table 4. Summary of historic measurements in lower Elk River as presented by O'Connor (2001).

Year	Gauge Station on Mainstem	Wrigley Residence on Mainstem	Concrete Bridge On North Fork
1964	+0.6 feet increase in bed compared with 1958[1]		
1966	+0.4 feet increase in bed compared with 1958[2]		
1996			+ 2.9 feet increase in channel and lower floodplain as compared to 1971[3]; no change in bed elevations as compared with 1969[4]
1997	+6 feet increase in bed compared with 1964	Cross Section measured	
1998			No change in thalweg as compared to 1996; +0.5 feet in overbank deposits
2000	-0.4 feet decrease in bed and thalweg compared with 1997 cross-section	-1 foot decrease in thalweg compared with 1997 cross-section	
2001			-1 foot in thalweg as compared with 1998[5], comparable to 1969

[1] 1964 cross-section is based upon discharge notes and apparently not documented directly.
[2] 1966 cross-section is based upon discharge notes and apparently not documented directly.
[3] Based upon 1971 and 1996 soundings and assumed cross-sections.
[4] Based upon a 1969 sketch of bridge and channel by Humboldt County which was not included in the Assessment
[5] Based upon field observations which were not included in the Assessment.

Observations in the lower reaches of Elk River indicate significant sediment deposition on channel banks resulting in channel narrowing and reduced capacity. During high flow events, the material deposited on the banks is mobilized or becomes unstable and erodes into watercourses. PWA (1998) documented bank erosion along sampled reaches in North Fork Elk River, as shown in Table 5. Sediment from bank erosion is an important source of beneficial use impairment as there is direct and complete delivery.

Table 5. Stream bank erosion for select North Fork Elk River reaches as documented by PWA (1998).

North Fork Elk River Bank Erosion Sampling Reach Location	Reach Length (ft)	Length of measured bank erosion (ft)	Bank erosion volume (yd^3)	Average erosion rate (yd^3/ft)
Confluence with Scout Camp to 1.33 miles downstream	6,996	2,919	4,661	0.67
Confluence with Bridge Creek to 0.8 upstream	4,198	2,127	2,021	0.48
Confluence with South Branch to 1.46 miles downstream	7,696	2,081	2,284	0.30
Total	18,890	7,127	8,966	0.47

Channel scour has not been as well documented, although Humboldt County bridge maintenance records indicate that staff were historically concerned about abutment scour (Klein, 2001b).

4.E Changes in Habitat or Condition of Wildlife Species

Klein (2003a & 2003b) summarized studies regarding the impacts to fish from chronic elevated turbidities. He evaluated continuous turbidity data from nine north coast streams and determined that North Fork Elk River exceeded all the streams in the duration of turbidity episodes over the thresholds evaluated. Elk River fish habitat is impacted due to the documented chronic turbidity levels in the Elk River watershed.

Regional Water Board staff observed South Fork Elk River in 1997 and suggested it could be used as a baseline surrogate for North Fork Elk River. Staff continued observations of South Fork since 1997 and observed significant channel, bank, and floodplain aggradation following major storms in December 2002. Regional Water Board staff also observed aggradation of fine sediment on the channel substrate (rather than historic gravels and cobbles discussed by Cafferata (1997)) with sediment deposits between two inches and one-foot in depth along the floodplain (White, 2003).

Residents describe having been able to swim in deep pools in lower North and South Forks of Elk River, where Regional Water Board staff have observed current summer water depths are low, water is stagnant, highly tannic, and duck weed is present. These changed conditions not only impair recreation and domestic water supply beneficial uses but also impair the fisheries resources.

4.F Accelerated Rates of Proposed Road Construction or Timber Harvesting Within the Watershed

The road construction history for the North Fork Elk River (Upper and Lower North Fork Elk River planning watersheds), as presented by PWA (1998) are summarized in Table 6.

Table 6. Road construction history for North Fork Elk River, as presented by PWA (1998)

Time Period	Miles
By 1954	29
1954-1966	22
1966-1974	25
1974-1987	9
1987-1994	22
1994-1997	26
Total by 1997	133

By 1997, the road density in North Fork Elk River was 5.6 mi/mi^2.

According to Regional Water Board timber harvest plan records, Table 7 provides approximate acres of timber harvesting and feet of road construction as proposed by Pacific Lumber.

Table 7. Timber harvest acres and road construction length in Elk River planning watersheds proposed since 2000.

Planning watershed	Total plan acres submitted since 2000	Total harvest acres submitted since 2000	Total proposed and constructed roads since 2000
Upper South Fork	1,702	1,377	20,870 ft (1.33 mi)
Lower South Fork	179	105	7,000 ft (3.95 mi)
Upper North Fork	2,040	1,180	26,721 ft (5.06 mi)
Lower North Fork	1,167	935	22,539 ft (4.27 mi)
Lower Elk River Elk River	N/A	N/A	N/A
Total	5,088	3,597	49,260 ft (9.33 mi)

According to the information presented in Table 7 above, as of 2003, the road density (proposed and constructed) in North Fork Elk River has increased to 6.1 mi/mi^2.

Section 5.0 Watershed Protection Documents Approved or Under Review

In addition to the scientific documents described *supra* and *infra*, numerous orders and other documents exist that relate to the proposed nomination under FPR section 916.8(a)(5). These include:

Pacific Lumber Company's Habitat Conservation Plan/Sustained Yield Plan, March 1, 1999.

Order No. 98-100. September 22, 1998. Cleanup and Abatement Order for Scotia Pacific Holding Company and The Pacific Lumber Company, North Fork Elk River, Humboldt County. North Coast Regional Water Quality Control Board.

Order No. WQ-2001-14. October 2001. Monitoring and Reporting Program for Scotia Pacific Holding Company and The Pacific Lumber Company, THP 1-97-520 HUM, Elk River. State Water Resources Control Board.

Bureau of Land Management. Management Plan for the Headwaters Forest Reserve (Draft), 2002.

Simpson Resource Management Company's Habitat Conservation Plan (Draft), July 2002.

Order No. R1-2002-0088. August 15, 2002. Monitoring and Reporting Program for Scotia Pacific Company LLC and Pacific Lumber Company, Elk River, Humboldt County, CA. North Coast Regional Water Quality Control Board.

Cooperative Agreement. September 24, 2002. Monitoring and Reporting Program for Simpson Resource Company, Elk River, Humboldt County.

Order No. R1-2002-0114, Cleanup and Abatement Order and Request for Technical Reports for Scotia Pacific Company LLC and the Pacific Lumber Company.

Order No. R1-2003-0007, Waste Discharge Requirements For the Pacific Lumber Company, Scotia Pacific Company LLC, and Salmon Creek Corporation.

Section 6.0 Suggested, Feasible Mitigation Measures

This section provides a method to meet the requirements of FPRs section 916.8(a)(6) and provide suggested, feasible mitigation measures. It builds on existing measures within the FPRs and Pacific Lumber's Habitat Conservation Plan (HCP, 1999), using a gradational approach proportional to the risk of discharge.

This approach begins with a determination of the stability of the land areas proposed for management activities. Protection measures along with specific design criteria are then linked to the land areas based on the land areas' stability and potential to transport sediment to watercourses. The measures and linkages are intended to: 1) prevent activities that increase the risk of erosion or mass wasting, 2) minimize discharges to watercourses, and 3) remedy existing sediment sources. As a general rule, as the landscape stability decreases, the level or extent of the investigation and/or protection measures increase. This framework of gradational measures mirrors the adaptive management approach of the HCP.

The California Department of Forestry and Fire Protection (CDF), the Department of Fish and Game (DFG), and the Regional Water Board staff have agreed that the aquatic resources and beneficial uses in the Elk River planning watersheds are "significantly cumulatively impacted," with a primary contributor being historic timber operations. Elk River is listed under CWA Section 303(d) as sediment impaired. Abundant evidence of this has been borne out by sediment

investigations by Pacific Watershed Associates (PWA 1998 and 2003) and in-stream and hillslope monitoring from Pacific Lumber, wildlife agencies, and the Regional Water Board. These all demonstrate that cumulative effects have resulted from timber operations. The degraded nature of the Elk River and its tributaries in the nominated planning watersheds requires a feasible program addressing prevention, minimization, mitigation, and focused restoration measures to restore beneficial uses.

Overview of the Gradational Approach

An outline of the proposed gradational approach is depicted below:

1. Determine landscape stability.
2. Designate control measures based on landscape stability.
   A. For stable landscapes employ FPRs and HCP prescriptions.
   B. For unstable landscapes employ an avoidance strategy (i.e., do not permit harvest these areas), in general.
   C. For metastable landscapes:
      (1) Employ a combination of landscape investigation and control measures, or
      (2) If uncertainty persists, develop a level of disturbance or a rate of harvest for the metastable areas. The development of the level of disturbance is a five-step process nested within the overall gradation approach and is detailed below.
3. Restoration
4. Monitoring

This nested gradational approach begins with determining the stability of the land areas proposed for site-specific management activities. Protection measures are then matched to the land areas based on the land areas' stability.

The landscape can be divided into three general categories of land stability: stable, metastable, and unstable. Stable lands are those areas that have a low probability to result in a sediment discharge to a watercourse as a result of land management activities. Unstable lands are those areas that have a high to extreme probability to result in a sediment discharge to a watercourse as a result of land management activities. Metastable lands are those landscape areas that have a moderate to high probability to result in a discharge to a watercourse as a result of land management activities.

Once the landscape stability classification is determined for a given land area, appropriate control measures can be evaluated for that particular land area. The control measures are progressive relative to the stability of the given land area. As the stability decreases, the level or extent of the protection measures increase. For stable areas the current FPRs and HCP prescriptions would be appropriate protection measures. For unstable areas avoidance of land management activities is recommended. For those lands classified as metastable, a more refined approach is recommended.

For metastable land areas, the allowable level of management activity is dependent upon the knowledge of the land area and consequence(s) of the proposed management activity. Metastable areas inherently have uncertainty due to lack of knowledge of their response to land management and the risk of discharge to receiving waters. As knowledge of the metastable areas is gained through characterization efforts, uncertainty is reduced. If characterization and protective measures reduce uncertainty and risk to defined acceptable levels, then management activities may proceed. Defined thresholds or levels of acceptable risk to the water resource are established in the Water Quality Control Plan for the North Coast Region (Basin Plan).

If too much uncertainty remains on the metastable areas then a rate of harvest limitation may apply to those areas. A rate of harvest limitation would be based upon the landscape response to land management and the condition of the beneficial uses of water quality.

The procedure for determining an acceptable level of disturbance for metastable lands is nested within the gradational approach and is generally as follows:

1. Determine overall sediment generation rates for the following erosion categories: landslides, bank erosion, and scour of low order channels, and road-related erosion. Sediment generation rates need to be determined over a time scale sufficient to include a triggering storm event.
2. Over the same time scale, refine the overall sediment generation rate based on managed and unmanaged lands within each erosion category.
3. For each erosion category determine the relative differences for the sediment generation rates for managed and unmanaged lands.
4. Consider the relative differences in these rates and an allowable threshold of sediment input to the receiving waters, then determine the level of disturbance that may be allowed in any given time period to maintain sediment levels below the allowable threshold. Allowable thresholds are established in the Basin Plan.
5. Adjust the level of disturbance and/or road construction/decommissioning, if appropriate as additional information is developed.

Two additional steps are necessary to complete the proposed approach: restoration and monitoring. Restoration can be independent of timber harvesting and can assist in the recovery of the beneficial uses of water with the Elk River watershed. Restoration measures are largely independent, as it can occur along with timber harvest activities or in those areas that are to be avoided. Restoration is especially necessary in critical locations within the metastable portions of the landscape in order to accelerate the recovery of beneficial uses of water. Properly designed monitoring programs are necessary to verify effectiveness of the proposed control measures and to document changes in water quality over time.

Definitions

Adaptive implementation: The application of the scientific method to decision-making. It is a process of taking actions of limited scope commensurate with available data and information to continuously improve understanding of a problem and its solutions, while at the same time making progress toward attaining a water quality standard. National Research Council (2001).

Feasible: Capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technical factors. With regard to economic feasibility, the issue shall be whether the plan as revised could be conducted on a commercial basis within 3 years of the submission of the plan and not solely on the basis of whether extra cost is required to carry out the alternatives.[2]" (FPR 2003).

Gradational measures: Those measures that go above and beyond the prescriptions contained in both the FPRs and the HCP.

Managed Lands: Managed lands are those where land management activities have occurred within the last 15 years.

Metastable Lands: Those landscape areas that have a moderate to high probability to result in a discharge to a watercourse as a result of land management activities.
Metastable lands are the most difficult to define because they are relatively stable in their natural setting, but may be highly unstable when subjected to different degrees of land management activities and/or triggering events.

Stable Lands: Those landscape areas that have a low probability to result in a discharge to a watercourse as a result of land management activities.

Unstable Lands: Those landscape areas that have a high to extreme probability to result in a discharge of sediment to a watercourse as a result of land management activities.

Step 1 – Landscape Stability Classification

Landscapes can be classified by their varying susceptibility to slope failures, fire hazards, vegetation types, with protection measures grading from less protective to more restrictive, relative to risk. This is well established in the scientific literature. For example, the United States Forest Service uses a Three Level Stability Analysis Concept (USFS, 1994) found in Appendix F. Another example is "The Jahnsian Steps to Geologic Safety: The Engineering Geology Approach" by Cole et al. (1992), found in Appendix G. These systems both recognize that land management decisions require varying degrees of stability analysis. Therefore, stability analysis is progressive in scale, detail, complexity, and accuracy as stability decreases.

Slope stability varies widely over the landscape. Therefore, it is logical to classify different areas as having lesser or greater potential for discharge of sediment to watercourses. In the Elk River watershed, Regional Water Board staff recommends a landscape classification approach that uses existing information with Geographic Information System (GIS) technology to classify the Elk River watershed into three categories: stable, metastable, and unstable.

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[2] Considering the extent and degree of impairment, and the length of time for cumulative effects to manifest in the Elk River watershed, a reasonable time period to fully restore beneficial uses could be on the order of decades. Thus the definition of feasibility has been adapted to a much longer period of time. Research has shown that prevention of future discharge through source control is the cornerstone of achieving the restoration of beneficial uses. This "ounce of prevention is worth a pound of cure" approach works because sufficient sediment reduction cannot occur solely through minimization, mitigation, and restoration activities alone. In fact, without meaningful source control, a high potential remains for failure of restoration efforts.

Step 2 – Appropriate Control Measures

Appropriate control measures are intended to build on existing measures within the FPRs and Pacific Lumber's Habitat Conservation Plan (HCP, 1999), using a gradational approach proportional to the risk of discharge. These control measures along with specific design criteria are based on the land areas' stability and potential to transport sediment to watercourses.

Design criteria for control measures are necessary to ensure proper and consistent installation and to measure the effectiveness of the control measure. The FPRs contains requirements for design criteria for a feasible, multi-component program that achieves water quality protection through prevention, minimization and mitigation of existing sediment sources, and watershed restoration.

Erosion prevention and sediment control measures are classified into three groups; mitigation and minimization, prevention, and avoidance. These three groups are linked to the three categories of landscape stability. This linkage is shown graphically in Table 8.

Table 8. Landscape Stability Classification

Measures	Stable	Metastable	Unstable
Avoidance			GM/avoidance
Prevention		HCP/GM	GM
Minimization Mitigation	FPRs/HCP		

In Table 8, the control measures correlate with landscape stability classification categories. It is a gradational approach that takes into account relative landscape stability and discharge potential. The stability classifications are linked to FPRs, HCP prescriptions and additional control measures that are intended to meet the stated objectives of restoring beneficial uses for water, primarily through mitigation of existing sediment sources, prevention of future sediment inputs, avoidance of sensitive areas, and focused restoration efforts. The dashed line represents a major jump to the most restrictive control measures. Avoidance may not be necessary if effective preventive measures can be utilized. A comprehensive monitoring program and feedback loop must be developed that evaluates the performance of the measures and the recovery of beneficial uses.

The degree of the control measure is proportional to the relative degree of landscape stability and the potential for discharge to receiving waters. Hence, the more stable the landscape, a lower degree of characterization and stabilization is required, and conversely the more unstable the landscape the greater degree of characterization and stabilization is required. Some lands classified as stable would cost very little to adequately characterize and stabilize effectively. Timber activities there would likely follow the existing FPRs/HCP, unless localized features are identified within the project boundary that meet unstable and/or metastable definitions. Some lands classified as unstable, which may be too expensive to fully characterize and stabilize effectively, might therefore need to have land management activities further restricted, beyond those currently required by CDF under the FPRs and the HCP/SYP.

In the case where the landscape meets the metastable definition, then, as general rule, site-specific field investigations are carried out to obtain the necessary information to lower the risk to water quality by increasing the margin of safety. The landscape investigations are gradational as well, including, but not limited to, characterization of surface conditions (interpretation of aerial photography, field observations, review of GIS data layers) and subsurface geologic conditions. With this information, control measures can be developed based on the site-specific condition. If there is little or no information about the metastable area and land management activities represent a risk to water quality, then land management activities will need to be restricted through the establishment of a reduced rate of harvest.

Currently, CDF has imposed and Pacific Lumber have agreed to a 600 clear-cut equivalent acre per year rate of harvest for Pacific Lumber's ownership within the Elk River watershed based on a peak flow analysis (Munn 2001). However, this rate of harvest does not recognize the spatial variability of landscape stability, and could allow the use of high-impact land management practices on metastable and unstable lands, leading to additional erosion.

The ISRP (2002) was commissioned by the Regional Water Board to evaluate several approaches of conducting sediment and peak flow data analyses, including Pacific Lumber (2001), Munn (2001), and Reid (1998). The ISRP found that: 1) the modeled sediment budget is data intensive and great uncertainty remains on the estimates, 2) Munn (2001) did not consider the sediment associated with increased peak flow, and 3) the Reid (1998) methodology is fundamentally sound with data input requirements consistent with information publicly available either currently or in the near future.

Timber harvest-related increases in peak flows and sediment transport need to be minimized below a defined, acceptable threshold of landuse disturbance in a planning watershed. Sediment generated from management-related landslide shall not exceed the water quality objectives established by the Basin Plan. These water quality objectives include: 1) turbidity shall not be increased more than 20% over naturally occurring background levels, 2) suspended sediment load and suspended sediment rate of surface waters shall not be altered to cause nuisance or adversely affect beneficial uses, and 3) settleable matter shall not cause nuisance or adversely affect beneficial uses.

Furthermore, for water bodies that are degraded and do not meet the water quality objectives, the Basin Plan provides that controllable factors should not be permitted to further impair receiving waters. Considering the significantly impaired beneficial uses of water in Elk River and its tributaries, controllable water quality factors that result in an increase in sediment inputs is not consistent with the Basin Plan. Controllable factors are those actions, conditions, or circumstances from man's activities that may be reasonably controlled.

In light of the impaired conditions of the Elk River, the information amassed regarding sources, the requirements of the Basin Plan, and based on the best available scientific data and analysis regarding water quality impacts and cumulative effects to impaired receiving waters, Regional Water Board staff propose that the Reid (1998) methodology, with refinements suggested by the ISRP (2002), be applied to metastable lands. The metastable lands are the areas where harvesting will be allowed but need to have additional controls on rates and/or methods of harvest, as they will be susceptible to increased landslide rates following harvesting.

As discussed in section 4.A of this nomination, debris landsliding accounts for 55% of total sediment delivered to the North Fork Elk River watercourses (PWA 1998). Potential measures for mitigating existing sediment sources are discussed by PWA (1998 and 2003). However, PWA does not propose mitigation of any debris landslides and torrent track scour. If mitigation is not a feasible option, prevention needs to be the focus for sediment discharges associated with debris landslides.

Two additional identified sediment sources are road-related erosion and road-related landslides. Prevention of road erosion and road-related landslides can be accomplished by applying more traditional geotechnical methods including but not limited to;

1) detailed and site-specific road location criteria;
2) adequate surface and subsurface characterization methods to provide data for application of stable designs, such as:

    - numeric analysis and meaningful construction techniques such as cut and fill control,
    - verifiable compaction standards,
    - critical height analysis,
    - shear keys across shear planes with granular backfill material,
    - properly sized and located drains.

3) oversight during construction by licensed professionals;
4) use of defined construction materials meeting defined performance specifications such as for competent rock, and;
5) short-term and long-term (life of road) monitoring, reporting, and maintenance measures.

The application of a gradational approach in combination with establishment of rates of harvest will help to address landscape stability, flooding, peak flows, and types of land management practices. These combined efforts will help to reduce peaks flows and hence bank erosion, initiation of debris torrents, road density, runoff, scour of sediment-laden channels, and debris landslides and thereby reduce the impairment that currently exists in the Elk River watershed and restore the beneficial uses of water.

Step 3 – Restoration

Restoration efforts focussed on existing sediment sources, whether in-unit landslides, stream bank erosion, scour of sediment laden channels or sediment discharge associated with the road or yarding system are often complicated by difficulty in accessing the sites. However, restoration activities can greatly accelerate the rate of recovery of the beneficial uses of water and attainment of water quality standards by removing, repairing or mitigating active and potential sources of sediment not associated with present land management activities.

Step 4 – Monitoring

A monitoring plan is an important component, in order to ensure that the control measures that are applied are proper and effective. The parameters of any monitoring plan must be able to determine compliance with the applicable thresholds detailed above and in the Basin Plan. These include, but should not be limited to, turbidity, suspended sediment load and rate, and settleable matter. The ongoing monitoring efforts by Pacific Lumber and state and federal agencies may provide much of this needed information. Also, given the potential complexity of the interrelationships of control measures, pre- and post land management activities, and triggering events, statistical analysis is advised.

Due to uncertainty in the prevention and mitigation measures, the ISRP (2002) underscores the importance of an adaptive implementation policy that relies on monitoring of the measures to limit sediment production.

Section 7.0 Other Watershed Information

FPR Section 916.8(a)(7) requires identification of other information which would be useful to the BOF in its rule-making processes. This information includes:

Final Report on Sediment Impairment and Effects on Beneficial Uses of the Elk River and Stitz, Bear, Jordan and Freshwater Creeks, Humboldt Watersheds Independent Scientific Review Panel, December 27, 2002

University of California Committee on Cumulative Watershed Effects, chaired by Professor Thomas Dunne, June 2001. A Scientific Basis for the Prediction of Cumulative Watershed Effects. Commissioned by the California Department of Forestry and Fire Protection.

Z'berg-Nejedly Forest Practice Act.

California Forest Practice Rules.

Water Quality Control Plan for the North Coast Region, June 28, 2001.

Section 8.0 References Cited

Section 916.8(a)(8) requires listing of literature citations, etc. In addition to the literature cited in Sections 1 through 7 above, literature and references relied upon for this nomination include the following:

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Section 9.0 Names and Addresses

A list of the required names and addresses is included as part of this sensitive watershed nomination package as Appendix H. The list includes:

- landowners of 40 acres or more of lands zoned for timber production in the planning watershed,
- water purveyors,
- commonly know watershed associations,
- commonly known neighborhood and community associations,
- chairman and county board of supervisors,
- chairman and county planning commissioners,
- public agencies, local managers,
- local timber harvest review team representatives.

Section 10.0 Public Notice

The following language is submitted per FPR Section 916.8(a)(10) as a draft proposed notice:

A nomination for designating the Elk River watershed in Humboldt County, California as a Sensitive Watershed has been submitted to the California State Board of Forestry and Fire Protection pursuant to their regulations. The Elk River watershed encompasses approximately 34,000 acres, located in five Calwater (version 2.2) planning watersheds. These planning watersheds are the Upper South Fork Elk River; planning watershed number 1110.000301; the Upper North Fork Elk River, planning watershed number 1110.000202; the Lower North Fork Elk River, planning watershed number 1110.000201, Lower South Fork, planning watershed 1110.000302; and Lower Elk River, planning watershed 1110.000402. The Elk River extends from Township 2 North to Township 4 North, and from Range 1 East to Range 1 West, Humboldt Base and Meridian. The Elk River watershed is located on the following USGS 7.5 minute quadrangles: McWhinney Creek, Iaqua Buttes, and Fields Landing. The Elk River is tributary to Humboldt Bay.

Specific resources that are significantly threatened by further timber operations on non-federal timberlands includes generally, water quality and the life forms and human activities that rely on it, and more specifically: (a) fish, aquatic organisms, aquatic habitat, and riparian habitat; (b) domestic water supplies and other beneficial uses of water; (c) factors related to the stream channel and morphology; (d) downstream reservoirs, navigable channels, and harbors; and (e) wildlife species and habitat for rare, threatened, and endangered species.

A public hearing will be conducted by the Board of Forestry and Fire Protection within 60 days of receipt of a nomination forwarded by the nomination review committee.

Further information can be obtained from the local California Department of Forestry and Fire Protection Ranger Unit Headquarters located at 118 Fortuna Boulevard, Fortuna, California 95540, phone (707) 725-4413.

(item15swnstaffreport)