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Chairman Jeffery Young
Central Coast Regional Water Quality Control Board
895 Aerovista Place, Suite 101
San Luis Obispo, CA 93401

re: Timber Harvest Program Update – Monitoring and Reporting Program

Dear Chairman Young:

I was the Hydrologist for the Mendocino County Water Agency (MCWA) from May 1989 to November 1994. The Mendocino County Board of Supervisors appointed me as their representative on pre-harvest inspections for Timber Harvest Plans (THPs) with the potential to impact public water systems. As the MCWA Hydrologist, I reviewed Proof-of-Water pump tests for the Town of Mendocino and I also routinely reviewed CEQA documents for projects before the Planning Commission. I have a Masters in Physical Science specializing in Hydrology from Chico State University. Since 1994 I have been a private consulting Hydrologist. I have also taught Hydrology at California State University, Monterey Bay.

I am submitting the following comments on the draft *General Conditional Waiver of Waste Discharge Requirements – Timber Harvest Requirements, Central Coast Region* on behalf of the Santa Cruz Group of the Sierra Club, the Lompico Watershed Conservancy, and Citizens for Responsible Forest Management.

I have reviewed the Staff Report for the July 8, 2005 meeting entitled *General Conditional Waiver of Waste Discharge Requirements – Timber Harvest Requirements, Central Coast Region, Resolution No. R3-2005-0066* and its several attachments posted on the Regional Board web site. The Staff Report proposes a Regulatory and Monitoring Requirement Eligibility Criteria Decision Tool (Eligibility Criteria) to assist the Regional Board and its Staff in deciding whether a proposed THP or Non-Industrial Timber Management Plan (NTMP) is eligible for a General Conditional Waiver for Timber Harvest Operations or if Individual Waste Discharge Requirements for Timber Operations would be more appropriate. The Eligibility Criteria also recommend what level of Monitoring and Reporting would be required. (In this letter, I use THP to refer to both THPs and NTMPs).

In my opinion, the proposed Eligibility Criteria (EC) and the Monitoring and Reporting Program (MRP) are seriously flawed. The Eligibility Criteria appear to be arbitrary and have not been demonstrated to protect the beneficial uses of water. The Monitoring and Reporting Program will not be able to generate useful data regarding the affects of Timber Harvest on water quality since the MRP lacks any requirement for the specified monitoring to be done according to a rigorous Quality Assurance/Quality Control Plan. Therefore, it is highly likely that similar data collected by different individuals will not be comparable and will be of little scientific value.

In addition, the entire procedure to enroll a THP into the General Conditional Waiver of WDR for Timber Harvest appears to be predicated on the assumption that the Forest Practice Rules (FPR) are sufficient by themselves to protect water quality, an assumption with no basis in fact.

Inadequacy of the FPR to Protect Water Quality

In December of 2002, the California Senate Office of Research (CSOR) issued a report entitled *Timber Harvesting and Water Quality; Forest Practice Rules Fail to Adequately Address Water Quality and Endangered Species* that summarized the history of water quality and timber harvest in California. The CSOR report concludes that the Forest Practice Rules (FPR) are insufficient to protect water quality and the beneficial uses of water. The CSOR report is attached to this letter.

In 1998 the USEPA refused to certify the California Forest Practice Rules as Best Management Practices to protect water quality. The USEPA finding regarding the Forestry portion of California's nonpoint source control program (quoted below and attached to this letter) indicates that the USEPA felt that the FPR are insufficient to protect water quality and the beneficial uses of water.

FINDING: California's program includes management measures in conformity with the 6217(g) guidance and includes enforceable policies and mechanisms for implementation. However, additional management measures are necessary in order to attain and maintain water quality standards (see Section XII, page 16).

Finding 9, quoted below, of the North Coast Regional Water Quality Control Board ORDER NO. R1-2004-0016 *Categorical Waiver of Waste Discharge Requirements for Discharges Related to Timber Harvest Activities On Non-Federal Lands in the North Coast Region*, adopted June 23, 2004, notes that the USEPA had not certified the FPR as best management practices that protect water quality and the beneficial uses of water.

9. The US Environmental Protection Agency and the State Water Resources Control Board are authorized to certify that the California Forest Practice Rules are Best Management Practices for timber operations on non-federal lands. When or if both entities so certify, timber harvest activities on non-federal lands will be exempt from waste discharge requirements pursuant to the Z'berg-Nejedly Forest Practice Act Section 4514.3, except as provided for in Section 4514.3(b)(1)-(3). That has not occurred to date.

Eligibility Criteria

The following comments pertain to the Eligibility Criteria presented in the Staff Report dated April 7, 2005. The Staff Report was prepared for the July 8, 2005 meeting of the Regional Board. Unfortunately, the administrative time line adopted by the RWQCB staff makes it impossible for me to discuss the final staff report that will be presented to the Regional Board at the July 8, 2005 meeting. The final staff report for the July 8, 2005 Board meeting will not be released with sufficient time to allow the public to submit comments in time for inclusion into the Board's agenda packet.

The April 7, 2005 Staff Report is essentially the same as the Staff Report for the February 10, 2005 Regional Board meeting, even though several experts submitted comments in early March 2005. The small number of changes that were made to the Eligibility Criteria appears to be the result of the discussion at the February 10 meeting and essentially ignore the comments submitted by experts in early March. The few changes that were made do not correct the serious deficiencies that I pointed out in my February 10, 2005 letter to the Regional Board.

Cumulative Effects Ratio

At the February 10, 2005 Regional Board meeting, the Board directed staff to add an additional factor to account for non-timber related cumulative impacts in a watershed. The Cumulative Effects Ratio (CER) was changed by adding a line stating that if a watershed is 303(d) listed as impaired for sediment or temperature then the CER is always considered to be high. This change is inadequate since it ignores cumulative impacts from non-timber land use in watersheds that are not 303(d) listed for sediment or temperature such as San Vicente Creek or Corralitos Creek.

Setting the CER of 303(d) listed watersheds to High does not protect the water quality of watersheds that are not listed from the combined impacts of timber and non-timber activities. Staff's approach to responding to the Board's direction to add a factor for non-timber related cumulative impacts fails to characterize the true threat to water quality in mixed use watersheds. Staff's approach has the potential to result in watersheds that are not currently 303(d) listed for sediment or temperature to degrade to the point where they will need to be listed in the future.

In my March 7, 2005 letter to Howard Kolb I recommended that impacts from non-timber land use could be approximated by the use of **one** of several possible indices that would be easy for a Geographic Information System (GIS) to calculate from information available from the County of Santa Cruz. Examples of such non-timber indices are:

- Percentage of watershed with non-timber zoning
- Road Density – number of miles of road per square mile of watershed
- Streamside Road Density – number of miles of road within 150 feet of streams per square mile of watershed
- Stream Crossing Density – number of stream crossings of road per square mile of watershed

GIS road layers typically under represent the true length of forest roads since the forest canopy obscures them in aerial photos. However, it is easier to accurately capture roads that serve rural-residential areas since the houses and other structures tend to be more visible on air photos. The road system in semi-urbanized areas tends to be well characterized on GIS layers. Therefore, using a GIS road layer as a surrogate for non-timber land use is reasonable.

While I disagree with staff that their approach of setting the CER to *High* in watersheds that contain waterbodies that are 303(d) listed for sediment or temperature will capture non-timber related cumulative impacts, I do think it is essential to do so since, by definition, 303(d) listed waterbodies are impaired and that the cumulative effects of all upstream land uses are the reason that they are impaired.

Drainage Density Index

In my previous letters I pointed out that the Drainage Density Index (DDI) proposed by staff is not supported by the literature. Letters submitted by Richard Harris, Cooperative Extension, and Dennis Hall, CDF both support my contention that staff's formulation of the DDI is not justified by the literature. Harris and Hall both suggest eliminating the weighting that staff assigned to the different classes of watercourse, as defined by the Forest Practice Rules (FPR). Eliminating the artificial weightings used by staff would result in the standard DDI. However, there is no information in the literature that would support a claim that a given DDI represented a low risk to water quality from management actions and that another value posed a high risk to water quality from management actions.

I recommend that the DDI be dropped from the screening tool. In place of the DDI, I recommend that the Erosion Hazard Rating (EHR) that is calculated for every THP be used in place of the DDI. The EHR gives an estimate of the vulnerability of a waterbody to sediment since sediment can only reach a waterbody after it has been eroded from the landscape.

Use of the EHR in the Eligibility Criteria has a distinct advantage over the DDI since CDF has already rated the numeric score of the EHR as low, moderate, high or extreme. Thus use of the EHR eliminates the difficulty in interpreting the results of the DDI.

Soil Disturbance Factor

The Soil Disturbance Factor (SDF) tries to measure the potential of various management practices to affect water quality. The SDF is the most important of the three factors since it represents actions proposed in the THP. If an applicant's THP results in a high SDF, the applicant would have the option to change aspects of the proposed THP to reduce the SDF. In contrast, the values of the CER and the EHR (or DDI) represent the condition of the landscape and can not be changed by a change in management practices.

Staff has made an attempt to characterize the potential of a given THP to disturb the soil. However, the procedure they used is seriously flawed. Staff's SDF combines several procedures into a single numerical rating which is arbitrarily classified as being high, medium or low. Their method is not supported by the literature.

Staff's proposed SDF uses twelve separate factors. Four of the twelve factors used to compute staff's SDF concern roads. Four similar factors concern skid trails, three factors concern landings and one factor addresses silviculture. The twelve factors are based on the following information:

- the weighted area of silviculture method, measured in acres
- the weighted length of roads and skid trails, measured in feet per acre
- the weighted length of roads on ground with a high or extreme EHR, measured in feet
- the weighted number of road and skid trail watercourse crossings, measured in the number of crossings
- the weighted number of in-lieu practices, involving roads or skid trails in the WLPZ, measured as the number of in-lieu practices
- the weighted number of landings, measured as the number of landings

Some type of weighting is applied to the above information to calculate each of the twelve factors. All of the weights are arbitrarily determined. Staff has provided no explanation for the choice of weights or why their selected weights are reasonable. Given the arbitrary nature of the weights, there is no reason to believe that staff's SDF will be able to correctly determine the risk to water quality and the beneficial uses of water for any given THP. Therefore, application of the procedure proposed by staff to all future THPs may result in significant adverse impacts to the environment, including cumulative impacts.

Each of the four factors in the roads subsection has its own dimensions (units). These four factors are then added together to produce a single numerical value for the roads subsection. The dimensions (units) of the single numerical value for the roads subsection are a blend of the units of the four contributing factors. In numerical modeling, this type of approach is avoided since it produces unexpected results for data outside

of the range used to fit the model. Because mixing units produces unexpected results from numerical models, this type of procedure is said to be irrational. Similar comments can be made for the skid trail subsection and for the calculation of a single overall numerical ranking for the THP.

Staff has dropped the yarding subsection from the calculation of the SDF and has included a factor for the EHR in the road subsection and a factor for the EHR in the skid trail subsection. However, they still use the same arbitrary scale of:

SDF < 1,000 = Low

1,000 < SDF < 2,500 = Medium

SDF > 2,500 = High

Staff was directed to incorporate the EHR in the Eligibility Criteria at the February 10 Board meeting. Staff's added the EHR by weighting the length of road on high and the length of road on extreme EHR ground. The weighted lengths are then summed and divided by 100 and are included as one of the four factors that are summed to give the overall score for the roads subsection. The method is employed in the skid trail subsection. The score for the length of road on ground with High or Extreme EHR can be viewed as a penalty for roads on erosion prone ground. However, the penalty for 2,640 feet (0.5 miles) of road on ground with a High EHR is only 53 points, for a 219 acre THP, and it takes 1,000 points before a THP is considered to have a Medium SDF. This appears to be a very small penalty for a high risk activity.

Staff accounts for in-lieu road practices in the WLPZ by weighting the number of road in-lieu practices by 10 and then dividing the result by 100. In other words, staff takes the number of in-lieu road practices in the WLPZ and divided them by 10. This means it would take 530 in-lieu practices to equal one-half mile of road on ground with a High EHR. This is an absurd result but demonstrates my concern of mixing scores with vary different dimension (units). Given the size of the thresholds for the SDF shown above, the method staff has used to account for road related in-lieu practices in the WLPZ, these high risk practices will never affect the outcome of the SDF.

Staff handles the soil disturbance from landings by applying a small weighting factor to the number of landings. The small weighting factor depends on whether the landing is tractor or helicopter landing or requires a WLPZ in-lieu practice. The weights are small enough in relationship to the SDF thresholds that the landings will almost never materially affect the outcome of the SDF calculation.

Decision Tool

Staff prepared a graphic to show which monitoring tier each of the eighteen possible combinations of CER, DDI and SDF would fall in. Staff has not provided any detail explanation of how the different combinations of CER, DDI and SDF were assigned to the various monitoring tiers.

Alternative Eligibility Criteria and Decision Tool

I have taken the comments from my February 10, 2005, March 7, 2005, and March 24, 2005 letters and have produced a more scientifically defensible set of Eligibility Criteria and Decision Tool. My method relies on values of indices reported in the literature and does not use arbitrary weights.

Alternative CER

In my March 7, 2005 letter I pointed out that staff's use of CalWater Planning watersheds may produce misleading results since *some* CalWater Planning watersheds are actually made of two or more adjacent watersheds. Different regions of such composite watersheds will not have a direct hydrologic connection.

In a hydrologically meaningful watershed, sediment that enters the stream channel network in the upland regions will eventually be transported to a single outlet. In a composite "watershed", sediment that enters the stream channel network in one upland region will eventually be transported to the outlet for that region but sediment that enters the channel network in a different region will travel downstream to its own outlet. Therefore, impacts in the headwaters of one region of a composite "watershed" will not affect the stream habitat conditions at the outlet of a different region of the composite "watershed". Thus, the cumulative effects for each sub-region of a composite "watershed" should be studied separate from the other sub-regions.

In my March 7, 2005 letter, I outlined a method that could be used to determine a hydrologically meaningful watershed that contains the THP and be in the size range of 10 sq-miles (6,400 acres) to 15 sq-miles (9,600 acres). The method I have proposed can be easily implemented with Geographic Information System (GIS) software and should not be burdensome to staff.

I also pointed out that it would be more appropriate to compute the rate of timber harvest over a 15-year period instead of the 10-year period used by staff. Studies at Caspar Creek show that 10-years may be too short of time for all of the logging related effects on the stream channel network to materialize. For example, in coastal California it is not uncommon for large storms to be under-represented in a 10-year period. Large storms can cause widespread failure of management measures. In addition, it takes several years for the roots of cut trees to decay and therefore increase the potential for landslides.

Staff has adapted a study by Randy Klein on the effect of timber harvest on chronic turbidity in north coastal California. Klein used a 15-year period in his evaluation of the annual rate of cut on chronic turbidity. Staff has assumed, without justification, that Klein's data would have produced the same average annual rate of cut over a 10-year period he found over a 15-year period. The rate of cut has not been uniform over the 15 to 20 years. Therefore, arbitrarily shortening the analysis period from 15-years to 10-years is likely to produce significantly different results of the average annual rate of cut associated with chronic turbidity in excess of 20 NTU.

In addition, the FPR for Santa Cruz County allow a 14-year re-entry period. Evaluating the CER over a 10-year time frame would clearly miss the impacts of the previous entry. Therefore, my alternative CER uses the percentage of the analysis watershed subject to timber harvest over the previous 15-year period as a factor.

By using the rate of cut in the analysis watershed over a 15-year period I can directly use the results of Klein's study to estimate chronic turbidity related to timber harvest. Klein's study found that when 15% of the watershed was cut over a 15-year period (1% per year), the chronic turbidity was close to 20 NTU and when 22.5% of the watershed was cut over a 15-year period (1.5% per year) the chronic turbidity was estimated to be about 23 NTU. Therefore, my procedure sets the following thresholds for the rate-of-cut over 15-years:

- less than 15% over 15-years is classed as **low**
- between 15% over 15-years to 22.5% over 15-years as **medium**
- over 22.5% over a 15-year period as **high**

I also use the road density calculated from the county's GIS layer as an index to the non-timber impacts. My method uses the stream habitat quality rating, associated with four different levels of road density, presented in Appendix E, Chapter 4 of the *Lower Columbia Salmon Recovery and Fish & Wildlife*

Subbasin Plan. See my March 7, 2005 letter for the values of the road density habitat thresholds and the bibliographic reference to the Lower Columbia River report.

After assigning an environmental rating to the road density and to the rate-of-cut separately, my procedure uses the average the two ratings as the CER rating. This procedure implicitly applies an equal weight to both factors.

Klein's study presents a multiple regression using the annual average rate of cut over a 15-year period and the road density calculated from GIS data to estimate the 10% exceedence turbidity (chronic turbidity) for eight streams in north coastal California. Adjusting Klein's regression coefficients for the difference in scale of the two variables (the annual rate of cut is in the range of 0.0 to 0.04 and the road density is in the range of 0 to 6.5) results in a coefficient for the rate of cut of about 4.6 and the coefficient for the road density is about 3.2, suggesting that applying an equal weight to both factors is reasonable.

Replacing the DDI with the EHR

My proposed procedure replaces the DDI with the EHR calculated in the THP. On some THPs, different regions of the THP need to be characterized by calculating a separate EHR for each region. Therefore, my procedure calculates a single area-weighted EHR for the THP.

CDF breaks the EHR into four risk classes, low, moderate, high and extreme. However, many of the FPR that use the EHR to determine the allowed practice typically apply a stricter standard only if the EHR is either high or extreme. This characteristic of the FPR essentially turns the EHR into a two value parameter with values of low or high. Functionally, this makes the EHR similar to the DDI proposed by staff.

Alternative SDF

My alternative SDF calculates the overall road density by using the un-weighted road length, skid trail length and equivalent length of landings. The equivalent length of landings is calculated by assuming that unmapped landings (landing less than 0.25 acres) have an average area of 8,000 square feet. This is just a starting figure that can be changed to reflect the average size of landings reported by industry. The average unmapped landing area is then divided by a road width of 16 feet to produce an estimated equivalent length of road. For mapped landings (landings larger than 0.25 acres) the estimated area of each mapped landing is estimated and the total area of all mapped landings is divided by 16 feet.

The length of all roads, skid trails and the estimated equivalent length of landings are then summed. The total "road" length is then divided by the watershed area. The final "road" density is then expressed in miles per square mile. The computed "road" density of the THP is then ranked using the adjusted road density thresholds. The procedure to adjust the road density thresholds is described below.

Table 4-4 of Chapter 4 of Appendix E of the Lower Columbia River study, attached to my March 7, 2005 letter, presents ranges of road densities associated with different levels of stream habitat. The road density thresholds that define each class are probably based on data produced by a broad-brush GIS road layer that did not account for logging and ranch roads. Therefore, it is necessary to apply a scaling factor to adjust the report road density thresholds to account for the missing roads.

The following quote from the *Santa Cruz County Justification Packet to the Board of Forestry – Proposed Rulemaking, Santa Cruz County Rules, October 1998* is useful in estimating a scaling factor for the missing roads.

Pg 6 The extensive network of private roads throughout the County's rural lands, most of which began as logging roads, is proof that there is no such thing as a 'temporary' road in this County. In a recent analysis of CDF approved timber harvest plans, County staff estimated there had been 113 miles of new logging roads constructed within the County over the last ten years. This is in addition to the reuse of existing truck and skid roads, which staff conservatively estimates at more than 400 miles. If compared to the entire existing County public road network, which is approximately 600 miles, the extent of the logging road network in the County is considerable. Given the slopes involved, the geologic setting and the use of some of these roads for purposes other than timber harvesting, the cumulative impacts to the watershed from these unpaved roads are significant. In light of the existing severe impacts to fishery habitat and other beneficial uses of County streams, the County is alarmed at the continuing rate of new logging road construction.

If the length of logging roads constructed between 1988 and 1998 (113 miles) is added to the lower bound estimate for the length of existing logging roads (400 miles) we get 513 miles of logging roads and former logging roads used as rural residential roads. A broad-brush GIS road layer would probably capture the roads such as the County road system (600 miles). So, the broad-brush GIS road layer would probably miss about half of the total number of roads.

So, the above analysis suggests that doubling the road density thresholds reported in Table 4-4 of Chapter 4 of Appendix E of the Lower Columbia River study would probably result in reasonable estimates of the thresholds that account for adding logging roads and former logging roads that used for other purposes to the roads in a broad-brush GIS road layer.

My procedure then adds up the number of all watercourse crossings whether they are on roads or skid trails. The total number of crossings is then divided by the THP area and expressed as the number of crossings per square-mile. A scaling factor is then applied to adjust the crossing density thresholds to allow a greater number of crossings per square mile on smaller THPs. The scaling factor for the crossing density thresholds may need to be adjusted as more data for THPs becomes available.

My procedure then computes a preliminary SDF by averaging the environmental ratings for the road density and crossing density.

If there are any road or skid trail related in-lieu practices in the WLPZ, the final SDF is set to *High*. This is done since there is no evidence that in-lieu practices in the WLPZ actually protect water quality and the beneficial uses of water.

Similarly, if the THP calls for winter operations, the final SDF is set to *High*. Justification for setting the SDF for a THP with Winter Operations to *High* can be found in Dr. Robert Curry's March 8, 2005 letter to Howard Kolb, RWQCB.

Alternative Decision Tool

Staff has never adequately explained their assignment of different monitoring Tiers to the various combinations of the risk categories of the CER, DDI and SDF.

My procedure uses a numerical scheme to assign the various combinations of the risk categories for the CER, EHR and SDF to the different monitoring tiers. The following table was used to assign numerical scores to the CER, EHR, SDF based on the risk category for each parameter. The scores for the three factors were then summed.

Table 1. Numerical scores assigned to each risk category for the three factors. Note that the EHR only has the High and Low risk categories. Also note that a High risk for the SDF was weighted heavier than the High risk category for either the CER or the EHR.

Risk	CER	EHR	SDF
High	6	6	8
Medium	4	N/A	4
Low	1	1	1

Table 2. The range of scores assigned to each monitoring tier.

Lower Score	Upper Score	Monitoring Tier
3	5	1
6	8	2
9	14	3
15	20	4

Table 3. All possible combinations of the risk categories for the three factors are shown along with their assigned score. The RWQCB staff's Monitoring Tier assignment is labeled *RWQCB Tier*. The Monitoring Tier assigned by my procedure is labeled *Alternative Monitoring Tier*. The last column notes if there is a difference in the Monitoring Tier assigned by the two methods. Most of the differences occur when the CER has a value of *Low*. The RWQCB Monitoring Tier is too low in the three cases where the CER is *Low* and the EHR is *High* because the risk to water quality should be considered significant when the EHR is *High*. A low CER only means that the existing cumulative effects are not serious and should not outweigh the risk associated with a *High* EHR.

CER	EHR	SDF	Score	RWQCB Tier	Alternative Monitoring Tier	Difference
High	High	High	20	4	4	no
High	High	Medium	16	4	4	no
High	High	Low	13	3	3	no
High	Low	High	15	4	4	no
High	Low	Medium	11	3	3	no
High	Low	Low	8	2	2	no
Medium	High	High	18	4	4	no
Medium	High	Medium	14	3	3	no
Medium	High	Low	11	2	3	Yes
Medium	Low	High	13	3	3	no
Medium	Low	Medium	9	3	3	no
Medium	Low	Low	6	2	2	no
Low	High	High	15	3	4	Yes
Low	High	Medium	11	2	3	Yes
Low	High	Low	8	1	2	Yes
Low	Low	High	10	3	3	no
Low	Low	Medium	6	1	2	Yes
Low	Low	Low	3	1	1	no

All possible combinations of the risk categories for the three factors are shown in Table 3 along with their assigned score. Figure 1 shows the graphical version of Table 3. The RWQCB staff's Monitoring Tier assignment is labeled *RWQCB Tier*. The Monitoring Tier assigned by my procedure is labeled *Alternative Monitoring Tier* in Table 3. The last column of Table 3 notes if there is a difference in the Monitoring Tier assigned by the two methods. Most of the differences occur when the CER has a value of *Low*. The RWQCB Monitoring Tier is too low in the three cases where the CER is *Low* and the EHR is *High* because the risk to water quality should be considered significant when the EHR is *High*. A low CER only means that the existing cumulative effects are not serious and should not outweigh the risk to water quality associated with a *High* EHR.

Monitoring and Reporting Plan

My March 24, 2005 letter to Howard Kolb, RWQCB, provides a detailed critique of the proposed Monitoring and Reporting Program (MRP). My March 24, 2005 letter also includes an edited version of the MRP. The draft Staff Report for the July 8, 2005 presents basically the same MRP that my March 24, 2005 letter critiques, however, the format of the newer version has been changed so that it appears to be visually different but its substance has not been significantly changed.

Some of the important points that I make in my March 24, 2005 letter are that:

- No Quality Assurance/Quality Control Plan is provided or required for any of the monitoring do for any Tier.
- The definition of storm events that trigger monitoring needs to be refined.
- More monitoring points need to be specified.

Conclusion

The Eligibility Criteria and the Monitoring and Reporting Plan presented in the Staff Report for the July 8, 2005 Regional Board meeting will not adequately protect water quality and the beneficial uses of water. My previous four letters document the many failings of the EC and MRP proposed by staff. Staff has changed very little of the substance of the EC and MRP since the time that my letters were written.

In this letter, I have presented a set of Eligibility Criteria with a stronger scientific basis than the criteria proposed by staff. I have also attached an Excel spreadsheet that implements my alternative Eligibility Criteria and Decision Tool. In my March 24, 2005 letter, I have provided detailed comments on the MRP.

Sincerely,



Dennis Jackson
Hydrologist

References

Curry, Robert, March 8, 2005, Letter to Howard Kolb, Central Coast Regional Water Quality Control Board.

Jackson, Dennis, February 10, 2005, Letter to Jeffery Young, Chairman of the Central Coast Regional Water Quality Control Board.

Jackson, Dennis, March 7, 2005, Letter to Howard Kolb, Central Coast Regional Water Quality Control Board.

Jackson, Dennis, March 15, 2005, Letter to Howard Kolb, Central Coast Regional Water Quality Control Board.

Jackson, Dennis, March 24, 2005, Letter to Howard Kolb, Central Coast Regional Water Quality Control Board.

North Coast Regional Water Quality Control Board ORDER NO. R1-2004-0016 *Categorical Waiver of Waste Discharge Requirements for Discharges Related to Timber Harvest Activities On Non-Federal Lands in the North Coast Region*, adopted June 23, 2004

Santa Cruz County Justification Packet to the Board of Forestry – Proposed Rulemaking, Santa Cruz County Rules, October 1998

Wiley, Kip, December 2002, *Timber Harvesting and Water Quality; Forest Practice Rules Fail to Adequately Address Water Quality and Endangered Species*, California Senate Office of Research

USEPA, Region IX, June 1998, *California Nonpoint Source Program Findings and Conditions*.

<http://www.epa.gov/Region9/water/nonpoint/cal/finding.html>

Attachments

California Senate Office of Research

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Timber Harvesting and Water Quality Forest Practice Rules Fail to Adequately Address Water Quality and Endangered Species

December 2002

*A generation ago, California enacted a forest-protection law widely heralded as the toughest in the nation. The law was supposed to guarantee a continuous supply of "high-quality timber" while protecting hillsides, watersheds and wildlife. Today, it is widely regarded as a failure on both accounts. – **Los Angeles Times, February 28, 1999***

Introduction

The practice of timber harvesting on state and private lands in California is, in most cases, failing to adequately protect water quality and endangered and threatened species. California forestry practices have been criticized in a number of state and federal government and scientific and academic reports as insufficient to protect public trust resources such as fisheries and water quality. These documented concerns are the subject of this paper.

Water quality and threatened and endangered species regulation is in the purview of the state Board of Forestry and the California Department of Forestry and Fire Protection. However, these two state agencies, by state law, do not see water quality and species protection as their primary responsibility. Rather, as the Z'Berg-Nejedly Forest Practices Act of 1973 states, their responsibility is to "encourage prudent and responsible forest resource management calculated to serve the public's need for timber and other forest products, while giving *consideration* [italics added] to the public's need for watershed protection, fisheries and wildlife and recreational opportunities alike in this and future generations."

Water Quality and Species Protection

Under Section 208 of the federal Clean Water Act of 1973, states are required to develop waste treatment management plans or water quality control plans. These plans are required to include "agriculturally and siculturally (timber-harvest) related nonpoint sources of pollution" in their management strategies. California uses the basin plans developed by the

state's regional water quality control boards as the equivalent of the federal water quality control plans.

The state's Porter-Cologne Water Quality Act of 1969 is the mechanism by which the state regulates water quality. Through the state board's nine regional water boards, the state adopts basin plans, issues permit and waste discharge requirements, and enforces water quality laws.

Historically, the regional water boards have always had the authority to issue waste discharge requirements to persons who harvest timber on private or state lands. However, very few were ever issued because they were labor intensive and other state agencies, such as the Board of Forestry and the Department of Forestry, were regulating timber harvesting. Many regional boards have addressed the issue by adopting general waivers of waste discharge requirements for timber harvesting.

In 1988, the Board of Forestry and the State Water Resources Control Board entered into a Management Agency Agreement (MAA) in which the Board of Forestry assumed the management of water quality issues associated with timber harvesting and the regional water boards "cease(d) issuance of waste discharge requirements for timber operations on nonfederal lands." The MAA did not drastically change the process of water quality review - it only formalized it.

Both the federal and state Endangered Species acts regulate species protection. Under the California Environmental Quality Act (CEQA), a lead agency is required to consult with the Department of Fish and Game if there is a take (killing) of an endangered species. The Department of Forestry is considered a lead agency under CEQA; however, timber harvest plans have been designated as a functional equivalent of CEQA and the development of an environmental review document is not required. If, in the timber harvest review process, the Department of Fish and Game disagrees with the Department of Forestry on the protections for endangered species, it can file a letter of nonconcurrence, which the Department of Forestry can accept or ignore. The only other avenue would be for the director of the Department of Fish and Game to file a Head of Agency Appeal, but no such appeal has ever been filed.

History of Water Quality and Timber Harvesting in California

Porter-Cologne Water Quality Act

In 1969, four years before the federal Clean Water Act, the Legislature passed the Porter-Cologne Water Quality Act to create the State Water Resources Control Board and the nine regional boards to "formulate and adopt state policy for water quality." The act provided for regional water quality plans and stated that "state policy for water shall be periodically reviewed and may be revised."

The act also required that "(a)ny person discharging waste or proposing to discharge waste within any region that could affect the quality of the waters of the state ... shall file with the regional board ... a report of the discharge, containing such information as may be required by the board."

Finally, the Legislature stated that "it is the intent of the Legislature that the state board and each regional board shall be the principal state agencies with primary responsibility for the coordination and control of water quality."

Federal Clean Water Act

The federal Clean Water Act of 1973 codified the objectives of "restor[ing], and maintain[ing] the chemical, physical, and biological integrity of the nation's waters." To meet this objective, Congress established a "national goal that the discharge of pollutants into navigable waters be eliminated by 1985." Congress also instituted a "national policy that programs for the control of nonpoint sources of pollution be developed and implemented in an expeditious manner so as to enable the goals [of the Clean Water Act] to be met."

As discussed above, Section 208 required "the development and implementation of waste treatment management plans and practices which will achieve the goals of [the Clean Water Act]." Specifically, the Clean Water Act requires, "Any plan prepared under such process shall include, but not be limited to ... a process to (i) identify, if appropriate, agriculturally and siculturally related nonpoint sources of pollution ... and (ii) set forth procedures and methods (including land use requirements) to control to the extent feasible such sources."

Forest Practices Act of 1973

The Forest Practices Act of 1973 came about because the state's 1945 Forest Practices Act, which was primarily the product of the timber industry lobby, was ruled unconstitutional in 1971.

Leaving logging practices unregulated was never seriously considered after the Court of Appeals decision. A number of legislative hearings were held, and the Assembly Natural Resources Committee requested a study from the Institute of Ecology at UC Davis. A 1975 Boalt Hall law journal article that analyzed the 1945 and 1973 acts concluded, "While the 1973 act does improve on many of the weaknesses of the former act, the improvements are modest."

The 1973 act created the state Board of Forestry, which was required to adopt forest practice rules (FPRs) that regulate the harvest of timber on private and state lands in California. As previously mentioned, these rules were to "encourage prudent and responsible forest resource management calculated to serve the public's need for timber and other forest products, while giving consideration to the public's need for watershed protection, fisheries and wildlife and recreational opportunities alike in this and future generations."

California forestry practices have for years been criticized as insufficient to adequately protect public trust resources such as fisheries and water quality. In addition, the timber industry feels burdened by a set of forest practice rules that began in 1973 and have been amended and enlarged over the last 29 years.

Over the years, the number of rules have increased. During a July 17, 2002, workshop held by the State Water Resources Control Board, a representative of the Department of Forestry testified that since 1988 the Board of Forestry had passed 135 rule packages. Comparing the thick book of rules to an earlier version, he told the board: "Actually, here is what our rule book was in 1985, and here is what our rule book is today. So there has been quite a change in the amount of regulations to the timber industry." He was followed by Joe Blum of the National Oceanic and Atmospheric Administration (NOAA) Fisheries Agency, who responded: "I don't really care how thick the book is. What I care about ... and what we are obligated to care about ... is ... what is in that rule book doing the job. And, candidly, it's not doing the job."

Best Management Practices and the Forest Practices Act

Methods to control nonpoint sources of pollution are generally known as best management practices (BMPs). Under federal regulation, BMPs are defined as "methods, measures or practices selected by an agency to meet its nonpoint source control needs. BMPs include, but are not limited to, structural and nonstructural controls and operation and maintenance procedures. BMPs can be applied before, during and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters."

In 1977, the Board of Forestry received funds from the federal Environmental Protection Agency (EPA) to develop BMPs as part of its forest practice rules and deliver them to the state water board and the EPA for approval by August 1978. The Board of Forestry finally submitted a draft portion of the BMP report in August 1979. However, both the state water board and the EPA identified deficiencies with the forest practice rules. The following year, the EPA notified the Board of Forestry that major reforms were necessary before the EPA could certify the forest practice rules as BMPs.

The Board of Forestry made some revisions to the rules relating to water quality and in 1984 requested they be certified as BMPs. While the State Water Resources Control Board still found significant problems with the forest practice rules, it decided it would certify them as BMPs on a temporary four-year basis with conditions.

In the state board resolution that certified the rules as BMPs, it was noted: "State board staff reviewed the revised Board of Forestry rules and expressed several concerns regarding the adequacy of the rules in protecting water quality..." The resolution went on to say that "if regional boards are not adequately involved in regulation of timber harvest operations through the issuance of waste discharge requirements ... water quality concerns ... will not be addressed."

In 1987, the state water board conducted public hearings to consider recertifying the forest practice rules as BMPs. The following year, the state board did recertify, but again made its determination contingent on the Board of Forestry making adequate reforms to the rules and their implementation. The EPA felt that significant deficiencies still existed with the rules. In a July 29, 1988, letter to the chair of the State Water Resources Control Board, Daniel W. McGovern, regional administrator for the EPA, stated: "It is my understanding that the MAA provides for improvements to the rules certified by the state as BMPs and to the procedures to implement these improvements. Given that these intended improvements are essential to the integrity of the Water Quality Management Plan, I am taking no action on the plan at this time. ...EPA intends to work closely with the state board in evaluating the BOF/CDF's progress towards making the agreed-on revisions...."

In 1979, the Forest Practices Act was amended to exempt timber operations conducted under the forest practice rules from the regional water boards' requirements to obtain a waste discharge permit if the federal EPA certified the forest practice rules as BMPs. To date, the EPA has declined to so certify. This 1979 revision is of continuing concern to state and regional water board staff, who worry they could further surrender water quality authority to the Department of Forestry if the EPA was ever to certify the forest practice rules as BMPs.

In a petition filed by 23 environmental, sport and commercial fishing organizations with the State Water Resources Control Board in June 2002, the petitioners stated that the "intended improvements" to the 1988 MAA "have never been implemented...." In a recent telephone conversation with Region IX of the EPA, it was confirmed that the EPA also believes that the required improvements have not been made, and that it has never certified the state's forest practice rules as BMPs.

The Management Agency Agreement of 1988

Under the Clean Water Act, states may delegate to a separate agency the responsibilities for carrying out portions of a water quality management plan by designating the agency as a "management agency" under the federal act. Such "(m)anagement agencies must demonstrate the legal, institutional, managerial and financial capability and specific activities necessary to carry out their responsibilities in accordance with Section 208 ..." of the Clean Water Act.

The State Water Resources Control Board began to develop water quality management plans in 1976 and identified the Board of Forestry and the Department of Forestry as potential water quality management agencies for the purpose of developing and implementing BMPs for timber harvesting. In 1984, the state water board designated the Board of Forestry and the Department of Forestry as management agencies for a four-year period, while expressing concerns over the water quality portions of the forest practice rules.

In February 1988, the state water board entered into a Management Agency Agreement with the Board of Forestry and the Department of Forestry. The MAA formally:

- Designated the Board of Forestry and the Department of Forestry as management agencies under the Clean Water Act.
- Transferred primary responsibility for water quality management for timber operations on state or private lands from the state and regional water boards to the Board of Forestry and the Department of Forestry.
- Required the State Water Resources Control Board to direct the regional water boards to cease the issuance of waste discharge requirements for timber operators.
- Required the Board of Forestry and the Department of Forestry to undertake a number of specific actions aimed at developing and implementing effective BMPs.

It has been almost 15 years since the MAA has been signed, and there is some disagreement over how many of the specific actions that were called for in the agreement have been accomplished. In the petition to the state water board signed by 23 environmental and fishing organizations and filed in June, the petitioners alleged that there has been a failure "to actualize any of the substantive reforms the state board required." Others familiar with the interactions between the parties say that between 60 percent and 70 percent of the issues were addressed adequately; however, water quality and endangered species concerns are still an issue. In its February 2000 proposal to list steelhead as a threatened species in Northern California, the National Marine Fisheries Service stated:

(A)lthough the FPRs [forest practice rules] mandate protection of sensitive resources such as anadromous salmonids, the FPRs and their implementation and enforcement do not accomplish this objective. Specific problems with the FPRs include: (1) protective provisions that are not supported by scientific literature; (2) provisions that are scientifically inadequate to protect salmonids including steelhead; (3) inadequate and ineffective cumulative effects analysis; (4) dependence upon registered professional foresters that may not possess the necessary level of multi-disciplinary technical expertise to develop timber harvest plans (THPs) protective of salmonids; (5) dependence by CDF on other state agencies to review and comment on THPs; (6) failure of CDF to incorporate recommendations from other agencies; (7) inadequate enforcement due to staffing limitations.

In addition, a number of scientific and government reports over the last eight years have pointed out that the forest practice rules are failing to protect water quality, wildlife and their habitat. Examples include:

- In 1994, the Little Hoover Commission reported: *Despite the hoops that timber operators must jump through and the barriers erected by the planning process, the environment is not being effectively protected because ... of the flawed concept that the Timber Harvest Plan process is based on -- namely that ecology can be addressed on a parcel-by-parcel basis. In addition, the state's focus is almost entirely on procedural steps rather than on the eventual outcome.*
- In 1998, the federal EPA reported: *California waters currently experience significant impacts from forestry. ... (S)ilviculture is the leading source of impairment to water quality in the North Coast of California. California has a number of species, in particular salmon, that are endangered, threatened or otherwise seriously at risk,*

due in very significant part to forestry activities that impair their spawning, breeding and rearing habitat.

- In March 1998, the Department of Forestry and the National Marine Fisheries Service entered into a memorandum of agreement in which the state pledged to review and make changes to the forest practice rules. The state also pledged to make recommendations to the Board of Forestry for rule changes to protect salmon species in order to try to avoid the Endangered Species Act listing of the steelhead trout. In 1999, the state Scientific Review Panel concluded that the current forest practice rules were failing to adequately protect salmon habitat. The Scientific Review Panel made numerous recommendations to change the forest practice rules; however, the Board of Forestry has failed to adopt a majority of those recommendations.
- In 1999, the National Marine Fisheries Service (NMFS) determined that the existing forest practice rules were inadequate. In its June 7, 2000, decision to list steelhead trout as threatened, the National Marine Fisheries Service said that "the NMFS/California MOA [memorandum of agreement] contained several provisions calling for the review and revisions of California's forest practice rules ... by January 2000." Since these "critical conservation measures were not being implemented by the state of California," NMFS felt it necessary to formally list the steelhead trout because the state "was not reducing threats" to this species.
- In 2001, the University of California Committee on Cumulative Watershed Effects published a report that said that, while the state requires timber harvest plans to include an analysis of the potential for cumulative watershed effects (CWE), "denials of the likelihood of CWEs are repeated regularly by applicants and reviewers, despite the widespread recognition among environmental scientists that, in the aggregate, timber harvest in coastal California has resulted and continues to result in radical alterations of water quality, habitat conditions, and perhaps flood risk."
- In April 2002, the Department of Fish and Game reported to the state Fish and Game Commission on the "Status Review of California Coho Salmon North of San Francisco." The review concluded that "timber harvest activities, especially past and present road construction, have had *deleterious effects* [italics added] on Coho salmon habitat. The department recommends that the commission add Coho salmon (from Humboldt County to the Oregon border) to the list of threatened species."

The North Coast Regional Water Quality Control Board, county governments and local communities have also raised water quality concerns. Sonoma County has sued the Department of Forestry for approving a timber-harvest plan that the local water agency and the regional water board say would adversely affect domestic water supplies. Several community groups are appealing timber harvest plans that they and the regional water board believe threatened domestic and agricultural water supplies.

In a State Water Resources Control Board workshop in July 2002, a board representative said that "the state and regional boards provided packages of rule amendments to the Board of Forestry" in 1997 and 1999. "In particular, the 1999 package was an integrated package that covered the full spectrum of the forest rules in an integrated way to provide what we thought was necessary for good water quality protection. The Board of Forestry has yet to act on that package, although they have incorporated pieces of it into other rule packages that they have adopted."

Board of Forestry's Interim Rule Packages -- 2000

The BOF has attempted to address endangered species and water-quality issues in the last two last years by adopting two interim rule packages. Regarding endangered species, the Interim Threatened and Impaired Watershed Addendum was adopted, initially for 12 months, in 2000. This rule package was comprised of a small percentage of the changes recommended by the Scientific Review Panel as necessary to protect endangered species. After considerable urging by the Legislature, the board extended these rules for another 12 months in 2001 and extended them again in 2002. They are due to expire in December 2003.

The second rule package, the Interim Watershed Mitigation Addendum, sought to address water quality issues. It was a timber industry-sponsored package that allowed landowners to self-characterize the condition of the watersheds they own. It also permitted them to propose mitigation measures to timber harvest plans that replace existing regulations and do not need to be as strong as existing rules. The Interim Watershed Mitigation Addendum rules were disapproved by the Office of Administrative Law on December 7, 2001, but the BOF readopted them in May 2002. It has been claimed by environmentalists that this rule package not only could lower the minimum standards that apply to streams with salmon in them, but also eliminates the requirement that alternative practices will provide "equal or better protection."

From the transcript from the BOF hearing on the rule package:

Bob Heald, board member: ... I think what we've heard in the committee meetings that there was concern that the 916.6 section required equal or better protection and that this made it unlikely the department would be able to approve an alternative practice.

Ross Johnson, deputy director of the Department of Forestry: I believe that is true and that is one of the reasons why I believe that this package came before the board was because we couldn't get past that – the issue of, *OK, now it's got to be equal and better than the interim rule itself. And there was a need, industry felt that there was a need, landowners felt there was a need to come in with something that didn't have that particular provision.*

SB 390, Statutes of 2000 – Legislative Review of Waste Discharge Waivers

Section 13269 of the Water Code authorized regional water boards to waive reports of waste discharge and waste discharge requirements. In 1999, the Legislature passed and Governor Davis signed Senate Bill 390 (Alpert), which amended that code section to do the following:

- Require regional water boards to review their waiver policies at public hearings.
- Require renewal of waiver policies by January 1, 2003. Failure to renew a waiver automatically results in its expiration. The duration of a new waiver may not exceed five years.
- Require a public hearing prior to renewing waiver policies to determine whether the discharge for which the waiver policy was established should be subject to a general or individual waste discharge requirement.

- Direct regional water boards to require compliance with the conditions pursuant to the waivers granted.

The nine regional water boards are now reviewing all existing waivers, and public hearings are being held. The North Coast Regional Water Board staff seems to be leaning toward adopting another categorical waiver for timber harvesting and has drafted a preliminary categorical waiver for timber harvesting that will be presented at a hearing in the near future.

Petition to the State Water Resources Control Board to Take Back Water Quality Responsibility – 2002

As previously noted, on June 20, 2002, 23 environmental, sport fishing and commercial fishing organizations filed a petition with the State Water Resources Control Board requesting the state water board take back water quality responsibilities from the Board of Forestry and the Department of Forestry.

In their request to the board, the petitioners alleged the Board of Forestry and the Department of Forestry:

- Used flawed cumulative impact analysis;
- Did not require adequate monitoring;
- Allowed inadequate standards for forest practice rules to be lowered with the interim rule packages; and contended that
- The forest practice rules were deficient.

The petitioners have requested the State Water Resources Control Board to revoke the Management Agency Agreement and carry out its responsibilities under the federal Clean Water Act and the state's Porter-Cologne Act.

Options and Actions

There are a number of proposals being discussed regarding ways to protect water quality and ensure species protection and continue to harvest timber. At the state water board's July 2002 workshop, a board representative suggested:

- CDF should seek to achieve compliance with applicable water quality goals and requirements as interpreted by regional boards, not just accept the least damaging alternatives pursuant to CEQA.
- The state and regional water boards should be authorized to advise the CDF director regarding compliance with basin plans – something that is not allowed under current rules.
- CDF should give great deference to any regional board findings that a timber operation has violated, or threatens to violate, water quality requirements.
- CDF should more consistently honor regional board requests for additional information from the project proponent, address regional board concerns and

questions during preharvest inspection, and incorporate or address regional board recommendations in a complete and timely manner in its review-team chair's report to the CDF director.

- An intermediate conflict-resolution process should be developed – something that falls between nonconcurrency, which the regional boards find ineffective because the Department of Forestry can ignore it, and head-of-agency appeal, which never occurs.

Almost everyone concerned, except the Department of Forestry, suggests that the current Management Agency Agreement should be updated or revoked. The state water board staff has been working with the Department of Forestry and Board of Forestry staff to develop a memorandum of understanding on amending the MAA.

Three main issues are being discussed:

- Do the regional water boards' basin-plan requirements apply to timber harvest plans?
- Do the basin-plan requirements apply to timber harvest plans as interpreted by the regional boards?
- When there is a range of disagreement, does water quality or species protection receive deference unless there are facts clearly to the contrary?

Finally, there is the issue of differing cultures between the state and regional water boards, and the Board of Forestry and the Department of Forestry. It seems that the Board of Forestry and the Department of Forestry view the issues they face through the lenses of the forest practice rules and the California Environmental Quality Act. That is to say, they strive not to make things worse. On the other hand, the Clean Water Act and the Porter-Cologne Act, which govern the actions of the water boards, seek to protect and recover resources as rapidly as possible. In addition, the Department of Forestry sees itself as the arbiter of water quality issues. It believes it has the right to interpret and apply regional water board basin-plan requirements.

Prepared by Kip Wiley

Glossary

Beneficial Use of Water – Water used for homes, human consumption, irrigation, livestock, hydroelectric power, municipal water supplies, mining, industrial and commerce practices, fish and wildlife preservation, recreation, water quality, groundwater recharge, etc.

Best Management Practices – A practice determined by the state to be the most effective and practicable method of preventing or reducing the amount of pollution generated by polluting sources. Determination is made after public participation and review of all other alternatives. This comes from the Federal Water Pollution Control Act.

Cleanup and Abatement Order – An order adopted by a regional board requiring the cleanup of a discharge or the abatement of an activity creating, or threatening to create, pollution or a nuisance.

Clean Water Act of 1972 – This federal legislation requires every state to submit a biennial report to the EPA, describing the quality of its surface, ground and marine waters.

Porter-Cologne Water Quality Control Act – Enacted by the California Legislature in 1970, it contains a complete framework for the regulation of waste discharges to both surface and ground waters of the state. It further requires adoption of water-quality control plans and the implementation of these plans by adopting waste discharge requirements for each discharger of waste that could impact the waters of the state.

Report of Waste Discharge – A regional board order to file such a report requires that a discharge into the state's waters be ceased for 120 days or until a permit to discharge is issued.

Waste Discharge Requirement – An order by a regional board regulating discharges of waste into the state's waters.

Endnotes

"Department of Fish and Game's Evaluation of the Implementation and Effectiveness of the Watercourse and Lake Protection Zones," Department of Fish and Game. Sacramento. July 6, 1995.

"Regulation of Logging on Private Lands in California Under Governor Gray Davis," Law Review, Golden Gate University. Spring 2001.

"Regulation of Private Logging in California," Ecology Law Quarterly, Vol. 5 1975.

Report of the Scientific Review Panel on California Forest Practice Rules and Salmon Habitat, Watershed Protection and Restoration Council. June 1999.

Review of Hillslope Monitoring Program Report Addressing the Effectiveness of Forest Practice Rules in Preventing Sediment Input to Streams, Stillwater Sciences. June 2002.

A Scientific Basis for the Prediction of Cumulative Watershed Effects, University of California Committee on Cumulative Watershed Effects, Wildland Resources Center, Division of Agriculture and Natural Resources. UC Berkeley. June 2001.

Timber Harvest Plans: A Flawed Effort to Balance Economic and Environmental Needs, Little Hoover Commission. Sacramento. June 1994.

Workshop on the Implementation of the Provisions of SB 390 as They Pertain to the Discharges of Waste From Silvicultural Activities, State Water Resources Control Board. July 17, 2002.

US EPA:

California Nonpoint Source Program Findings and Conditions

June 1998: <http://www.epa.gov/Region9/water/nonpoint/cal/finding.html>

III. FORESTRY

FINDING: California's program includes management measures in conformity with the 6217(g) guidance and includes enforceable policies and mechanisms for implementation. However, additional management measures are necessary in order to attain and maintain water quality standards (see Section XII, page 16).

RATIONALE: The primary authority in California to implement the management measures for forestry in conformance with the 6217 (g) guidance comes from the Z'berg-Nejedly Forest Practice Act (FPA) (Cal. Pub. Res. Code 4511 *et.seq.*). Regulations (14 Cal. Code Reg. 895 *et.seq.*) adopted pursuant to this law include practices in conformity with the management measures. The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCBs) also have oversight over nonpoint discharges associated with forestry operations through the Porter-Cologne Act. The Porter-Cologne Act provides back-up authority for implementing the management measures, including waste discharge requirements, cease and desist orders, cleanup and abatement orders, civil monetary liability for specified violations, and criminal prosecutions for specified violations.

Prior to any timber harvest on non-federal lands, a Timber Harvest Plan (THP) must be prepared by a Registered Professional Forester. A multidisciplinary and interagency review is intended to be conducted for all THPs to meet the functional equivalency requirements of environmental documentation under the California Environmental Quality Act (CEQA). These activities are carried out primarily by the California Department of Forestry and Fire Protection and the Board of Forestry(CDF/BOF), as well as the RWQCBs, in accordance with the Water Quality Management Plan for Timber Operations on NonFederal Lands, and the Management Agency Agreement (MAA), as overseen by the SWRCB.

Although California does have the basic legal and programmatic tools to implement a forestry program in conformity with Section 6217, these tools have not been fully effective in ensuring water quality standards are attained and maintained and beneficial uses are protected. California waters currently experience significant impacts from forestry. For example, silviculture is the leading source of impairment to water quality in the North Coast of California. Related to these water quality problems, California has a number of species, in particular salmon, that are endangered, threatened or otherwise seriously at risk, due in very significant part to forestry activities that impair their spawning, breeding and rearing habitat.

Section 6217 recognizes that implementation of the (g) management measures alone may not always be adequate to protect coastal waters from nonpoint sources of pollution. In these cases, Section 6217 requires the identification and implementation of additional management measures. Thus, California will need to adopt additional management measures for forestry to address coastal waters that are not attaining or maintaining applicable water quality standards or protecting beneficial uses, or that are threatened by

reasonably foreseeable increases in pollutant loadings from new or expanding forestry operations. (See Section XII, page 16)

Scores for the Eligibility Criteria Decision Tool

by Dennis Jackson 5/17/2005

Sorting Index	CER	EHR	SDF	CER	EHR	SDF	Score	RQWCB Tier	Monitoring Tier	Difference
1	H	H	H	6	6	8	20	4	4	0
2	H	H	M	6	6	4	16	4	4	0
3	H	H	L	6	6	1	13	3	3	0
4	H	L	H	6	1	8	15	4	4	0
5	H	L	M	6	1	4	11	3	3	0
6	H	L	L	6	1	1	8	2	2	0
7	M	H	H	4	6	8	18	4	4	0
8	M	H	M	4	6	4	14	3	3	0
9	M	H	L	4	6	1	11	2	3	1
10	M	L	H	4	1	8	13	3	3	0
11	M	L	M	4	1	4	9	3	3	0
12	M	L	L	4	1	1	6	2	2	0
13	L	H	H	1	6	8	15	3	4	1
14	L	H	M	1	6	4	11	2	3	1
15	L	H	L	1	6	1	8	1	2	1
16	L	L	H	1	1	8	10	3	3	0
17	L	L	M	1	1	4	6	1	2	1
18	L	L	L	1	1	1	3	1	1	0

Scores Risk	CER	EHR	SDF
H	6	6	8
L	1	1	1
M	4	0	4

Lower Score	Upper Score	Monitoring Tier
3	5	1
6	8	2
9	14	3
15	20	4

Number of Cases in each Monitoring Tier	Total Cases
3	18
4	
7	
4	
5	

Eligibility Criteria Decision Tool

by Dennis Jackson 5/17/2005

	Computed Value	Score ¹
CER	Medium Risk	4
EHR	High Risk	6
SDF	High Risk	8
<hr/>		
	Total Score	9
	Monitoring Tier	3

¹ See worksheet "Tier Table" for score values assigned to each risk category

Cumulative Effects by Dennis Jackson 5/17/2005

Rate of Cut

Acres Harvested in Watershed Assessment Area (WAA) in last fifteen years	Acres of future THPs within the WAA	Acres to be harvested as part of proposed THP/NTMP	Total Area of Watershed Assessment Area (WAA) in acres	Percent of WAA Cut in 15 years	Rating for the Rate of Cut	Ranking
1450	200	200	10749	15%	Moderate	2

Road Density (WAA) sq-miles	Miles of Road in WAA	WAA Road Density per sq-mile	WAA Road Density Rating ¹	Overall Ranking
16.80	10.00	0.60	Excellent	1.5

Preliminary Cumulative Effects Ratio Risk = **Medium Risk**

Is there a 303(d) Listed Waterbody downstream? no

Final Cumulative Effects Ratio Risk = **Medium Risk**

Notes:

*** Watershed 303d listed as impaired from sediment or temperature?**

¹ Ratings are of stream habitat conditions associated with the given value of road or crossing density presented in Lower Columbia Fish Recovery Board, December 2004, Lower Columbia Salmon Recovery and Fish & Wildlife Subbasin Plan VOLUME I - REGIONAL PLAN. Appendix E, Chapter 4, Integrated Watershed Assessment http://www.lcfrb.gen.wa.us/December%20Final%20Plans%20Plans%20lower_columbia_salmon_recovery_a.htm

Erosion Hazard Rating

by Dennis Jackson 5/17/2005

Erosion Hazard Rating	Rating Area A	Rating Area B	Rating Area C	Rating Area D	Area Weighted EHR factor for THP	Eligibility Criteria Rating for THP
Area in Acres ¹	200	19				
Percent of THP Area	400.00%	38.00%	0.00%	0.00%		
EHR Factor Rating ²	50	75				
Area Weight Rating ³	200.0	28.5	0.0	0.0	228.5 Extreme EHR	High Risk

Notes:

If the Erosion Hazard Rating worksheet in the THP NTPM computes an EHR for separate area, then an area weighted EHR is computed for the THP.

¹ EHR worksheet sub-area acreage determined from the THP maps

² EHR Factor Rating from the Erosion Hazard Rating worksheet in the THP

³ Product of EHR Factor Rating for sub-area and the sub-area is percentage of THP area

⁴ The Eligibility Criteria Rating for an EHR of Extreme or High is "High Risk"
The Eligibility Criteria Rating for an EHR of Moderate or Low is "Low Risk"

Revised Soil Disturbance Factor by Dennis Jackson 5/17/2005

Area (HP) 6 Area (HP) 6 (ft ²)	Soils 00% soil							
Similar	Good	Slight						
	0	12						
	Soils/Temporary Existing		All we Other/ Remnant Existing		Road Equivalent		Ratio ²	Ratio ³
Roads Linear feet	50	0	0	0	50	feet		
Skid Trails Linear feet	80	0			80	feet		
Landings Number of Landings > 0.25 acres	Good	Header	Total Landings		0			
Area (acres) of All Landings > 0.25 acres	0			0				
			Total points to Area Over All HP Road Dist		1/20 feet 4	1 mile ² /mi ²	Ratio	4
					The Coring Density			
Coring - Number and Class where core is	Class I	Class II	Class III	30 Total Corings 3.4 corings/ft ²			Ratio	3
	0	0	3					
					Primary Soil Disturbance Ratio		High Risk	Primary Ratio 350
					Number of fish Abol in Waz		0	
					Number of fish Abol on the pda		0	
					Wind Control		Yes	
					Final Soil Disturbance Ratio		High Risk	

Notes

¹ Landings Road Length Conversion Factor
Equivalent to 16 Road
Landings > 0.25 acres

50 feet

Area Landings > 0.25 acres
about

800 feet

² Ratio of fish abundance with the ratio of fish abundance in
Lower Columbia Fish Recovery Board, December 2004,
Lower Columbia Salmon Recovery and Fish & Wildlife Subbasin Plan VOLUME I
Appendix E, Chapter 4, Integrated Watershed Assessment
<http://www.fishbase.org/US/December%20Final%20Plan%20Volume%20I>

³ Ratio shown in the Ratio worksheet

⁴ All HPs are in the Alpaes in the Wazooos with the exception of the SF and the GH

Rating Susceptible in Eligible Criteria

by Denver

Adjusted Road Density Thresholds

Low	High	Class	Rank
0	4	Excellent	1
4	6	Good	2
6	12	Fair	3
12		Poor	4

The thresholds from Table 4-4 of Chapter 4 of Appendix E of the Lower Columbia River study were doubled

Scaled Stream Crossing Density per Sq Mile

Low	High	Class	Rank
0	25.6	Excellent	1
25.6	38.4	Good	2
38.4	51.2	Fair	3
51.2		Poor	4

Thresholds are scaled by THP area to allow a higher number of crossings/sq mile for smaller Plans

EHR

Low	High	Class	Decision Tool Rating
50	50	Low EHR	Low Risk
65	65	Moderate EHR	Low Risk
75	75	High EHR	High Risk
		Extreme EHR	High Risk

Rate of Cutover 15-years

Low	High	Decision Tool Rating
0	0.15	Low Rate
0.15	0.225	Moderate Rate
0.225		High Rate

Overall Rating

Low	High	Rating
0	1.33	Low Risk
1.33	2.66	Medium Risk
2.66		High Risk

1 is Jackson 5/17/2005

led to account for bogging roads.

isk

Soil Disturbance Factor

Soil	Group	Station	Class	Disturbance
Strata	Arain PPA	2		2
Rais	Linear Estimation	100	0	0
	Class	X1	X2	X1
	Class	0	0	0
	Number of Abundant	5		
	HR Number of	24	0	
Sida	Linear Estimation	85	0	
	Class	X1	X2	X1
	Class	0	0	2
	Number of Abundant	0		
	HR Number of	500	0	
Lada	Group	1	0	
	HR	0	0	
	Number of Abundant	0	0	
	HR	0	0	
ENL	Class			
	Class			

Estimation of