UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

COMMENT RESPONSIVENESS SUMMARY

for the Mattole River Total Maximum Daily Loads for Sediment and Temperature

December 2002

INTRODUCTION

This document describes how the U.S. Environmental Protection Agency (EPA) is responding to comments received from the public on the proposed Mattole River Total Maximum Daily Loads (TMDLs) for Sediment and Temperature. EPA solicited comments from the public from 24 October 2002 to 25 November 2002. The public submitted several comments, questions and recommendations to EPA during the period via written letters or verbal statements made at public meetings held on 12 and 13 November 2002. For each comment received, this document summarizes the comment and EPA's response, and identifies whether the final TMDLs were revised based on the comment. The document is organized according to the individual or organization submitting the comments. In most cases, comments are quoted directly from the source. In certain cases, comments are paraphrased. EPA did not address comments that did not pertain to the Mattole River TMDLs. EPA appreciates the level of interest and constructive input received by the public on this TMDL. Further questions about this document or the final TMDLs should be directed to Doug Eberhardt at 415-972-3420 or eberhardt.doug@epa.gov.

The proposed Mattole River TMDLs were based on a technical support document (TSD) prepared by North Coast Regional Water Quality Control Board (NCRWQCB) staff. Comments were received from the public on both the TMDLs and TSD. NCRWQCB staff assisted in the preparation of the responses to many of the comment summarized herein.

INDEX OF COMMENTORS

SUMMARY OF COMMENTS AND RESPONSES

Commentor 1: Stephen Davies, representing Robert and Janet Busch, residents

Comment 1-1: Prevalence of Ranching. Ranching is a historic and prevalent land use activity in the Northern Mattole Subbasin. Currently, about 600 cow/calf pairs graze on lands owned by The Pacific Lumber Company/Scotia Pacific Company. At least 107 cattle graze in the riverbed of the Upper North Fork of the Mattole River. Cattle from property leased to Humboldt County Supervisor Roger Rodoni by The Pacific Lumber Company/Scotia Pacific Company have, continuously since at least 1982, entered the riverbed and banks of Oil Creek, Rattlesnake Creek and the Upper North Fork of the Mattole River onto property belonging to Robert and Janet Busch at the confluence of Oil Creek and Rattlesnake Creek with the Upper North Fork of the Mattole River. I am aware of at least two other landowners who graze cattle in the Northern Mattole Subbasin but who do not employ fences to protect watercourse or restrain cattle from entering lands held in title by other property owners.

RESPONSE: EPA recognizes that cattle ranching occurs in the Mattole watershed, but cannot confirm the specifics mentioned by the commentor. EPA recommends that the NCRWQCB take the information into account when developing measures to implement the TMDLs.

Comment 1-2: Impacts of Cattle Grazing. Cattle grazing has significant environmental impacts.

A number of individuals and government agencies have raised concerns with cattle grazing in the Northern Mattole Subbasin in connection with the processing of timber harvest plans.

Waters of the Upper North Fork of the Mattole River have been rendered unfit and unwholesome to drink as a result of the large quantities of cattle manure deposited in the riverbed and banks of the Upper North Fork of the Mattole River.

The discharge of excessive quantities of cattle manure in the Mattole River during low volume flow summer months probably has an adverse impact on amphibian and insect species supporting salmonid populations and can be a barrier to fish migrating upstream to Oil and Rattlesnake Creeks.

Land management practices in the Oil Creek and Rattlesnake Creek confluence areas have not focused on protecting watercourses from impacts caused by cattle. For example, The Pacific Lumber Company/Scotia Pacific Company and Roger Rodoni maintain a seasonal electric fence that needs to be replaced every year across the Upper North Fork of the Mattole River between approximately October 15 and January 15 each year when water levels rise, which could operate as a barrier to coho, chinook, and steelhead - all of which are present in at least Rattlesnake Creek and the Upper North Fork of the Mattole River (see REQUEST FOR ADMINISTRATIVE ACTION RE: REMOVAL OF ELECTRIC FENCE FROM LOW FLOW BED OF UPPER NORTH FORK OF THE MATTOLE RIVER, filed 15 October 2002, with the North Coast Regional Water Quality Control Board). We believe that cattle at the confluence of Oil and Rattlesnake Creeks has many other undocumented

adverse impacts including, but not limited to, loss of riverside vegetation affecting stream temperature and animal wildlife, dispersion/widening of watercourses (partially documented), localized ponding and stagnation of waters (partially documented), sedimentation of gravel beds in areas with low depth but high rate of flow above pools during winter months (partially documented), watercourse temperature, changes to the rate, depth and duration of water flow, changes to the river morphology, and displacement of native plant and animal species.

How can a TMDL be considered a comprehensive analysis of the sediment sources if it does [not] take into consideration the presence or absence of cattle grazing in each watershed? If conditions in the Oil/Rattlesnake Creek confluence are occurring elsewhere in the watershed, and they likely are, what is the overall cumulative impact when migrating salmonids have to contend with multiple herds of cattle and substantially increased nitrogen levels in their breeding habitat?

RESPONSE: EPA recognizes that cattle grazing can cause a variety of significant adverse environmental impacts. EPA is establishing TMDLs for sediment and temperature, because those are the pollutants for which the Mattole River is listed under Section 303(d) of the Clean Water Act. The State of California has primary responsible for carrying out many provisions of the Clean Water Act, including making listing decisions pursuant to Section 303(d). EPA will give a copy of the all public comments to NCRWQCB staff for their consideration of appropriate action, but if the commentor has further information that other pollutants are impairing the beneficial uses of the Mattole River or its tributaries, EPA suggests that the commentor send the information directly to NCRWQCB staff.

EPA defers to the NCRWQCB as to the pending request for administrative action by the commentor regarding the electric fence.

The commentor mentions several impacts of grazing related to sediment. NCRWQCB staff conducted field surveys in various locations in the watershed as part of the development of the TSD, and they estimated the volume of sediment from all significant sediment sources they encountered. The TMDL sets load allocations for general source categories, and although sediment delivery related to cattle grazing may be significant in specific areas, it was not found to be significant for the watershed as a whole, so no load allocation for grazing was set. The NCRWQCB is responsible for developing measures to implement the TMDLs. EPA encourages the NCRWQCB to consider ways to address any local impacts of grazing, during development of the implementation measures.

The commentor also mentions impacts of grazing related to stream temperature. The temperature TMDL concludes that any reduction in riparian shade would cause exceedance of the water quality standards for temperature. The NCRWQCB will consider how to apply the TMDL at a more local scale, during development of implementation measures.

Comment 1-3: Information on ranching. Baseline information concerning ranching activities (number of animal units, type of fencing employed, proximity to watercourses, etc.) should be considered. Unlike other indica of habitat viability involving long-term measurements of geophysical processes,

baseline data on cattle grazing can be obtained simply by asking the ranchers in the Mattole Hydrologic Area. In conclusion, because ranching is one of the most predominant land use activities in the area, ranching methodologies and their impacts should be considered more fully in determining the TMDLs for sediment and temperature than they presently are.

RESPONSE: Although ranchers may collect certain kinds of data related to grazing, they may not have information needed to estimate sediment delivery to streams. Instead of relying on an information request to ranchers, NCRWQCB staff conducted field surveys to collect the needed information. See also response to comment 1-2.

Commentor 2: J.J. Hall, resident

Comment 2-1: TSD Chapters 1 and 2. Introduction of the TSD is concise and clear. Chapter 2 of the TSD lays out the problem very clearly.

RESPONSE: EPA thanks the commentor for the comment. No change in the draft TMDLs is requested or required in response to the comment.

Comment 2-2: TSD Section 3.1.3.2 on sediment from roads. BLM's King Range road complex is an example of drastic road improvements needed in the Conservation Area. Please determine the sediment delivery potential of these dirt roads as part of a comparison with county, private and federal reduction responsibilities.

RESPONSE: Information available from road inventory work done by BLM was considered in the analysis. The TMDL analysis is intended to give a watershed-scale depiction of sediment delivery conditions. The sediment TMDL sets load allocations for broad categories of sediment sources. Problems with individual roads or ownerships should be addressed by the NCRWQCB as they develop measures to implement the TMDL.

Comment 2-3: TSD Section 3.1.3.3 on conditions in Mattole Watershed. At the end of this paragraph Wilder Ridge is described (BLM 1996). I request reevaluation to validate runoff potential be conducted for the entire road, both sides. The dirt switch backs and "Beaver slide" shortcut draining into Honeydew Creek on the north end of Wilder Ridge is a perennial silt delivery system that needs attention and if not now inventoried, be estimated for delivery potential.

RESPONSE: See response to comment 2-2.

Comment 2-4: TSD Chapter 3, page 3-22, on Dry Creek. Dry Creek with its 'lots of roads' is not representative of the eastern subbasin as a whole and Table 3.5 derived through photo analysis places too much singular concern on Dry Creek's road system when the rest of the subbasin has way fewer road-related failures and a significant factor for landslides due for the most part, to natural causes. The

loading reductions for the eastern subbasin are too extreme when geology, semiology and rainfall for the entire subbasin are considered.

RESPONSE: The rate of sediment contribution per road mile was derived for the Dry Creek planning watershed using field surveys. The contribution per road mile that was determined was then applied to the whole Eastern Subbasin using GIS road coverage. In that way the density of roads in the Dry Creek basin did not affect the results for the entire Eastern Subbasin. Only the number of road miles, determined from GIS coverage, and the contribution per road mile applied.

Comment 2-5: TSD Section 3.2.3.3, on Livestock. Please either acknowledge where there is a problem, or state unsure of impacts if any.

RESPONSE: See response to comment 1-2.

Comment 2-6: Earthquakes. Loading occurs naturally with earthquakes. Even if a road is present, the event is not man induced, however it may appear. Even a small earthquake can cause mass wasting. An example, a small 3.+ quake slipped a massive slide into the Mattole on the southwest bank of the river at the convergence with 4 Mile Creek in 2000.

RESPONSE: The issue is not whether an earthquake triggered the mass wasting event, but whether the event would have occurred in the absence of human activity. The sediment source analysis separates sources associated with human activity from those with no evident association (natural). Clearly, many earthquake-induced failures are natural. Equally clearly, some failures triggered by earthquakes may not have taken place had not human modification of the surface been done.

Comment 2-7: Roads. County roads and private roads must be compared for the entire project as well as in subbasins. County roads are chip sealed, however all the ditch relief systems must be inspected.

RESPONSE: NCRWQCB staff did not have time to survey every road in the watershed, differentiating between county and private roads. Instead, they conducted field investigations of 54 randomly selected road segments. Each segment was 1000 feet long. County and private roads were analyzed together. The results from the surveys were extrapolated to each of the major subbasins and the entire watershed as described in the TSD (section 3.2.4.1, subsection on Road Surveys).

EPA agrees that inspection of roads in important. The sediment TMDL includes a target of annual inspection and correction of all roads (see Table 3-2 in the TMDL). See also response to comment 2-2.

Comment 2-8: Natural sediment rates in western subbasin. Natural causes for sediment between 4 Mile and Sholes Creeks occur at a rate I believe is higher than this report gives them credit for. The

analysis omitted a substantial portion of the study area. Implementation of sediment reduction guidelines could result in the over burdening of private land owners and their road complexes.

RESPONSE: Because constraints on the TMDL study did not permit analyzing the entire Western Subbasin, NCRWQCB staff chose a planning watershed considered representative of the subbasin and extrapolated the results from that watershed to the entire subbasin. The commentor's empirical observations in the valleys of Four-Mile and Sholes Creeks may be accurate. However, the analysis covers only slides that show movement on aerial photos between 1984 and 2000. Many of the natural slides that occurred before that interval were not included in the analysis.

Comment 2-9: TSD Chapter on Temperature. Very informative.

RESPONSE: EPA thanks the commentor for the comment. No change to the TMDLs are requested or necessary.

Comment 2-10: TSD Table 3.15, Sediment TMDL and Load Allocations. I believe the 55% loading reduction is 20% overly aggressive due to the environmental conditions unique in the middle Mattole specifically, and the whole drainage in general. Most of my arguments in the paragraphs above pertain to this point of natural mass wasting versus human management associated mass wasting.

RESPONSE: EPA believes that the sediment sources have been properly identified as natural or associated with human activity, given the available information.

Comment 2-11: Road construction. Roads are being built daily all over the County of Humboldt and the State of California. I suggest requiring all road builders and maintainers to be trained, certified and even reviewed on all new road building plans in Humboldt County. A special grader certification of county rural dirt road maintenance should be encouraged and then enforced.

RESPONSE: EPA agrees that road construction and maintenance practices need improvement to reduce sediment delivery to streams. Requiring training and certification of road builders and maintainers, however, is beyond the scope of the TMDL. EPA encourages the County and State to consider these and other approaches to reduce sediment delivery from roads.

Comment 2-12: TSD Figure 1.3 on Rainfall. A rainfall table and a map from my ranch are enclosed to help hone in on the correct rainfall contours for TSD Figure 1.3. Enlarge that 115 inches line over more on the western subbasin to include portions of Wilder Ridge nearest to King Peak and all points in between.

RESPONSE: We thank the commentor for the additional data, but the NCRWQCB is retaining the rainfall contour map produced by the CDF in the TSD, because this seems to be the best single source available for the watershed. EPA is retaining the shorter discussion of climate in section 1.2 of the TMDL. The information in this section is included in the TMDL to give the reader a sense of the

watershed. The changes in rainfall estimates suggested by the commentor would not alter the main point of the figure, which is that rainfall amounts in the Mattole watershed are very high.

Commentor 3: Stephen R. Horner, Scotia Pacific Company

Comment 3-1: Salmonid populations. The TSD relies heavily upon the current perceived condition of much-reduced salmon populations as evidence of sediment and temperature impairment of the Mattole River. This is perhaps a spurious conclusion that should be supported by increased investigation of information currently available to the Regional Water Board. If adult salmon populations are to be used as a surrogate for watershed health, including sediment and temperature conditions, then the TSD will require a thorough presentation of other non-freshwater factors that affect adult salmonid populations.

RESPONSE: EPA acknowledges that there are multiple factors which have contributed to the decline of adult salmonid populations. EPA is establishing TMDLs for sediment and temperature, the pollutants for which the Mattole River is listed pursuant to Section 303(d) of the Clean Water Act. The Basin Plan designates beneficial uses for the Mattole River and establishes water quality objectives to protect those uses. The TMDLs focus on impacts to salmonid habitat, because the most sensitive beneficial uses in the watershed related to sediment and temperature appear to be those that pertain to salmonid habitat. Section 2.3 of the TMDL describes the freshwater habitat requirements of salmonids related to sediment and temperature, and section 2.4 describes current habitat conditions. This information provides the basis for EPA's conclusion that water quality standards for sediment and temperature are not being attained in the watershed. EPA recognizes that restoration of salmonid populations will require improvements in other areas, including other aspects of the freshwater environment and in ocean conditions. Improvements in sediment and temperature are necessary, but not sufficient to restore salmonid populations.

Comment 3-2: Turbidity and salmonid growth. Regarding the reference to Trush, 2001, please be aware that the association between turbidity levels and salmonid growth in the Mattole River is entirely theoretical, and requires additional investigation before conclusions can be drawn for the Mattole River.

I contend that the Regional Board has access to data on smolt sizes that could be used to test the Trush hypothesis that smolt size has been reduced in the Mattole River and other North Coast streams. The TSD discloses that downstream migrant data exists for the Mattole River, which could be used to quantify smolt size of Mattole River salmonids. This data could be compared against historical smolt size data to gain at least some information as to the magnitude, if any, of the change in smolt size. For the purposes of the TSD, please conduct some analysis of smolt size from available Mattole River data, or admit that smolt size in the Mattole as a result of increased turbidity is conjecture.

RESPONSE: Trush, 2001, is referenced in the TSD in the section describing the habitat requirements of salmonids related to turbidity and suspended sediment (section 2.4.2). The TMDL report has a much shorter description of habitat requirements and does not reference Trush, 2001. Determining the past relationship between turbidity and downstream migrants in the Mattole may not be possible, given the lack of past turbidity monitoring. Regardless, the TMDLs (and TSD) are not intended to test whether or not data available for the Mattole support any particular research. That elevated sediment, including turbidity and suspended sediment, can adversely affect salmonids is well established in the scientific literature. See especially Berg and Northcote (1985), Sigler et al. (1984), and Newcombe and Jensen (1996) regarding the relationship between turbidity and salmonid growth and feeding.

Comment 3-3: Food availability and salmonid growth. Growth of juvenile salmonids is largely governed by food availability. Different food availability levels affect tolerance of different turbidity and temperature levels. The TSD discloses that the Regional Water Board has not acquired or reviewed any data from macroinvertebrate sampling. This is an unsettling disclosure that the Regional Water Board has left what could be perhaps the most important factor in salmonid growth, and yet in so many places bases watershed management decisions on evidence of poor salmonid growth. Please correct this shortcoming by obtaining, reviewing and summarizing macroinvertebrate sampling data for the Mattole River. Without data on macroinvertebrate populations that feed salmon populations, how is the Regional Water Board sure that altering current conditions in the watershed through implementation of the sediment and temperature TMDL will not adversely affect existing macroinvertebrate populations in the Mattole River? Please provide at least a basic disclosure of the linkage between streamside canopy conditions, instream sediment conditions, instream woody debris loading and macroinvertebrate production.

RESPONSE: EPA agrees that food availability is an important factor affecting juvenile salmonid growth. The TMDL identifies an improving trend in aquatic insect production as a water quality target for the watershed. However, EPA does not agree that data on macroinvertebrate populations - at the present time - would clarify (1) whether or not food availability is limiting salmonid populations or (2) the extent to which macroinvertebrate populations are tied to reductions in streamside canopy, increased sediment and temperature. The use of macroinvertebrate conditions to assess water quality is an area of active interest at present. EPA is supporting research to develop macroinvertebrate indices suitable for use in the Mattole. The California Department of Fish and Game also continues to work in this area. It would be appropriate to evaluate the indices identified in Table 3-1 of the TMDL with any newly developed indices for with respect to suitability for use in the Mattole.

The TSD has been revised to include a discussion of macroinvertebrate conditions in the Mattole watershed, based on the NCWAP report for the Mattole, which summarizes macroinvertebrate data collected by BLM and Pacific Lumber Company at 21 locations in the watershed. Data were interpreted according to a number of indices assessing diversity, richness, composition, tolerance/intolerance, and other factors. The NCWAP summary, after assigning qualitative descriptors to the results for each index value, characterized conditions for each location sampled. Overall conditions generally were described as fair to good or good.

The TMDLs, when implemented, will reduce stream temperatures and sediment delivery, returning the streams to more natural conditions. We know of no evidence to support the suggestion that alteration of the stream toward the natural conditions in which the macroinvertebrate populations evolved would be detrimental to these macroinvertebrates.

Comment 3-4: Scotia Pacific Company. Please be aware that Scotia Pacific Company, LLC, is extremely concerned about the good health of the Mattole River watershed. It is also necessary to recognize the hard work of the TSD production staff.

RESPONSE: EPA thanks the commentor for the comment. No change in the draft TMDLs is requested or required in response to the comment.

Commentor 4: Maureen Roche, resident

Many of the following comments provide insight, experiences, and opinions about various issues related to fisheries, and watershed processes in the Mattole River watershed that the commentor has gained over time. Many of the comments do not request or require revision to the TMDL or TSD, and thus, for such comments, no revisions have been made. The NCRWQCB has indicated that they plan to consider this information in future revisions to the TMDL. In the itemized comments and responses that follow, the response to this type of comment is simply "comment noted." The EPA and NCRWQCB thank the commentor for providing this information.

Comment 4-1: Unit conversions. Add conversions for meters to feet.

RESPONSE: A table of conversions has been added to the TSD.

Comment 4-2: Unit Conversions. Add conversions for Centigrade to Fahrenheit.

RESPONSE: A table of conversions has been added to the TSD.

Comment 4-3: River miles. Add a map showing river miles. Pick a published set of river miles and use it consistently. You have omitted from your bibliography Department of Water Resources 1973 (Character and Uses of the Mattole River), the only published set of mileages which is also the seminal work that attempts to quantify temperatures, sediment, and salmon.

RESPONSE: The NCRWQCB has reported data as it was submitted, including river mile identifiers. EPA and NCRWQCB recognize the confusion caused by different river mile reporting conventions, however it is not appropriate for the NCRWQCB to alter data submitted. To alleviate confusion associated with this issue, NCRWQCB staff has added a table to the TSD which presents (1) the DWR (1973) river mile convention used by Mattole Salmon Group and BLM, (2) the 1:100,000 scale river miles that Watershed Sciences, LLC. based distances associated with the TIR data, and (3) the

1:24,000 “blue line” river miles used by the North Coast Watershed Assessment Program (NCWAP).

Comment 4-4: Data source. Suggest omitted Department of Water Resources (1973) document “Characteristics and Uses Mattole River” as only published reference.

RESPONSE: NCRWQCB staff were unable to obtain a copy of this report, however both EPA and NCRWQCB believe that the information presented and/or cited is sufficient to provide the basis for establishment of the Mattole River TMDLs.

Comment 4-5: Peaks. Add ten peaks over 2000 feet as reference points in watershed.

RESPONSE: While we appreciate the suggestion, making this change will not add materially to the analysis. NCRWQCB will consider this suggestion during future revisions of the TMDL

Comment 4-6: Other Data. Add findings of ten years diving with Mattole Salmon Group to correlate models to actual coho and chinook presence. I dive 50 miles/year in the Mattole for summer steelhead with teams, for 70 temperature sites, and with habitat typing pre and post project evaluation. In addition, I collected with Bureau of Land Management aquatic macroinvertebrates, spring and fall, over 21 sites for six years. I sampled sediment in 1999 at 80 Bear Creek Mattole at Shandley and at Phillips by McNeil and V*. All of my temperature sites include spring and fall dives, habitat type, and estimated flows, especially eutrophic and dry sites. I spent 12 years with Mattole Salmon Group and tried to correct NCWAP errors, but most still exist in this work. I also dove for steelhead nursery creating tables of pool depths and temperatures for river mile 0-5, plus habitat typing, cross-sections, DSMT, and most of biology for dynamics of recovery.

RESPONSE: Although comparing fish presence and absence with modeling results would lead to an interesting analysis, the results would not affect the temperature TMDL analysis since the charge is to evaluate water quality conditions relative to water quality standards. The water quality standards identified in the Basin Plan for the Mattole River apply to its tributaries as well, whether or not fish currently inhabit the tributary. Whether fish are present depends on many factors outside the scope of these TMDLs. The NCWAP report may be a better vehicle to address this issue.

Comment 4-7: Watershed Location. Mattole enters Pacific 30 air miles or 55 road miles south of Eureka. Correct name is Bear River, not Bear Creek. The King Range borders the watershed to the west.

RESPONSE: The corrections have been made.

Comment 4-8: Population. The population of the Mattole basin is 2000, not 1200. Ettersburg is frequently mentioned in the document, but it is not mentioned in this section or identified on maps.

RESPONSE: Commentor did not provide data or reference that supports revision of population figure, so no change has been made. Population figure in the text is from the NCWAP report, which relied on 2000 census data. Ettersburg has been added to figures.

Comment 4-9: Rainfall. Rainfall orographically responds to elevation. At 1000 feet in elevation, I receive 100 inches of precipitation, and over 50% of the Mattole is greater than 1000 feet in elevation.

RESPONSE: Comment noted

Comment 4-10: Topography. Department of Water Resources (1973) describes Mattole in three natural sections; NCWAP five are arbitrary and without rationale. Upper third ends at Bear Creek (river mile 42.8) and the valley opens at river mile 41. Between river mile 52.1 (Bridge) and 47.7 (Eubanks) is the Grand Canyon of the Mattole: 20 foot cliffs, 20 foot pools and 8 foot falls between an unnavigable whitewater summer diving reach. This makes the middle (in drainage and channel type) from river mile 42.8 (Bear) to 26.5 (Honeydew Creek). Lower reach, many sections of ~~river~~ marine terraces.

Tributary valley are wide at confluences (largest to smallest): Lower North Fork, Upper North Fork, Bear, Honeydew, Squaw, and Mattole Canyon Creek.

RESPONSE: Comment noted.

Comment 4-11: Vegetation. Willows and cottonwood are major structure of riparian areas. 80% deforestation in 17 years equals too intense of rate, exacerbates runoff. NCWAP claims 54% over 43 years.

RESPONSE: Comment noted.

Comment 4-12: Hydrology/Geology. Increased runoff is from deforestation, unable to slow rain into soil pipes egress to gentle groundwater. Natural events include trees and salmon 200 million years older than recently uplifted 15 million years ago. Franciscan young and incompetent, deluged by 100 inches of rain annually. We are the leading edge of the San Andreas (in San Francisco 200,000 years ago).

RESPONSE: Comment noted.

Comment 4-13: History and Land Use. Neb Roscoe, "Heydays in the Mattole," talks about climbing onto a 12 inch willow branch over a 40 foot deep hole in the estuary in 1940. Also, green sturgeon were seen in 1977 at river mile 3.5.

Rainfall high and woefully potentiated times 100 by runoff. *{EPA interprets this to mean that rainfall is high to begin with, and the effects are magnified by a factor of 100 due to increased runoff from management activities.}*

RESPONSE: Comment noted.

Comment 4-14: Table 1.1. Blue line miles equal 2, not 61. Highest elevation is not 20 feet, but 2000 feet (Uncle Tommy).

RESPONSE: Length of blue line streams includes entire mainstem of Mattole River. The elevation figure has been corrected in revised TSD.

Comment 4-15: Limiting factor. Limiting factor is no rearing/nursery as only summer cold reach (59°F) dries up secondary to human agricultural use killing 400 coho and chinook juveniles per mile over 10 miles.

RESPONSE: Comment noted.

Comment 4-16: Salmonid populations. Mattole Restoration Council used Mattole Salmon Group five year plan (1995-2000) salmon spawner trends: chinook 5%, coho 1%, summer steelhead 0.5% of historic levels, still barely viable.

Juvenile coho and chinook have only been found in the headwaters rearing (before eutrophy) and rarely found with electroshocking or diving in Big Finley, Thompson, Yew, South Bear, and Mill Creeks. Only in 1997 were 7000 chinook in estuary (river mile 1). Since 1987, after a high flow year scoured 18 foot holes. *{EPA interprets the last two sentences to mean that 1997, a year where high flow had scoured 18-foot deep holes, was the only year since 1987 to support as many as 7000 chinook in the estuary.}*

RESPONSE: Comment noted.

Comment 4-17: Salmonid Life Cycle and Habitat Requirements. Only a few summer steelhead females evolved to repeat spawn. Smoltify in a few days.

Eggs take 3-4 weeks to hatch. Alevin in rocks can be buried for 3-4 weeks.

Small gills do clog, but swirling suspended sediments actually erode gills to hemorrhage.

Table 2.2 should note that it pertains to MWAT temperature.

RESPONSE: Comments noted. Metric in TSD table 2.2 has been revised.

Comment 4-18: Habitat Conditions in the Mattole River Watershed. Estuary fills with accumulated sediment.

Sediment documented in Lower North Fork, Upper North Fork, Bear, Honeydew, Squaw, Conkin and Mill, McGinnis, Pritchett, Dirty, Cook, Bundle, Dry, Westlund, 4 Mile, Sholes, Yarrow, Grindstone, Gilham, Mattole Canyon, Blue Slide, Deer Lick, Harts, Lil Finley, Eubanks, McKee, Baker, McNasty, Van Arken, Stanley, Harris, and Phillips Creeks by embededness, McNeil, and V* for NCRWQCB, Pacific Lumber Company, DFG, and Mattole Salmon Group (32 of 73 tributaries).

Thermal refugia, especially tributary confluence pools, do provide 2-10° relief, but only steelhead benefit as coho and chinook have not utilized last ten years.

Flow is also critical; like temperature, only one hour over 68°F, or dissolved oxygen less than 4 ends rearing. Diving temperature sites over last ten years has revealed moribund early fall conditions in 34 of 73 tributaries and 12 headwaters miles. The estuary has had eutrophic conditions only three of last ten years (probably 80° plus high nitrogen equals algal blooms). Intermittence in dry bedrock reaches denies rare cold pools of oxygen and dead zone or eutrophy ensues. In 23-26 September 1999, 80% mortality during three day heatwave when homes and gardens dewatered headwaters, lost an estimated 1600 chinook and 200 coho.

RESPONSE: Comment noted. NCRWQCB will consider any data submitted in future phases of the TMDL process.

Comment 4-19: Instream Indicators. Instream indicators often reflect cumulative conditions.

Table 3-1 omits Merritts 1994 for thalweg profile. Pool:riffle distribution and depth omits Aquatic Conservation Strategy of PACFISH (FEMAT 1993). 1:1 ratio is one of five parameters (temperature < 68°F, large woody debris 1 foot by 10 feet > 80/mile, <25% > 90% or raw, width:depth 10:1). Large woody debris also stabilizes banks, tourniquets sediment for slow release (also PACFISH).

Table 3-2 disturbed area comments: protect to volunteer revegetate and stabilize by roots and groundwater egress.

RESPONSE: Comments noted.

Comment 4-20: Sediment Rates. Mattole has friable young rock and violent persistent uplift and temperate rainforest precipitation. High deforestation rates (and roads to access harvest areas) have denuded hillslopes, to desert in some places, and accelerated runoff by 100 times. Major soil structures are gone and 10,000 year old soil lost becomes sediment.

Mineral raw rock has lost viability when soils bled off.

RESPONSE: Comment noted.

Comment 4-21: Rate of deforestation. Rate of deforestation increases damage from uplift rate by 100 times.

Please note Redwood Sciences Laboratory. Leslie Reid on uplift rates, deforestation rates (Pacific Lumber Company Sustained Yield Plan) and need for mature riparian forest to cover 50% land area.

RESPONSE: NCRWQCB was unable to locate the discussion on rates of uplift, deforestation and the need for mature forest on the Redwood Sciences Laboratory website, so they were not considered.

Comment 4-22: Allocations and critical conditions. 86% reduction - wow! My grandchildren may delight.

"TMDL must account for critical conditions for stream flow," NCRWQCB only address lower mainstem flows, but dewatering is documented over spacetime in 34 tributaries and headwaters!

RESPONSE: The TMDLs must account for critical conditions. As discussed in section 4.3.4 of the TMDL, EPA believes the critical condition for temperature is the summer period, when stream temperatures are highest. Although salmonids inhabit the Mattole River and its tributaries during various life stages and a various times of the year, EPA believes that excessively warm stream temperatures are most likely to adversely affect salmonids during the summer period, when young salmonids are growing in the streams before migrating to the ocean.
EPA acknowledges that water quantity is a serious salmonid habitat issue, however the task of the temperature and sediment TMDLs is to evaluate the impacts of land use on stream temperatures and sediment conditions, and not to investigate all factors impacting salmonid habitat. The State Water Resource Control Board's Division of Water Rights is the entity responsible for regulation of water quantity.

NCRWQCB staff investigated the relationship of flow and stream temperature. The NCRWQCB analysis indicates that flow is not a major factor influencing stream temperatures in the lower order streams (tributaries and headwaters) in the Mattole River watershed. NCRWQCB temperature data, as well as the commentor's comments, indicate that in the smaller streams with good canopy conditions the stream temperatures remain cool even in those areas where flows diminish to the point of no flow.

Comment 4-23: Water use. Unknown ~~some~~ water is diverted primarily for domestic use (then irrigation secondary). 1973 Department of Water Resources study considered dam at river mile 51.

RESPONSE: Comment noted.

Comment 4-24: Sensitivity Analysis. Welsh at Redwood Sciences Laboratory notes "edge effect" even with 300 foot riparian forest closed canopy. At river mile 56.8 to 51, Mattole warms by radiation

of adjacent airmass. Consider August 1998: rivermile 26.5 water 84 deg air 22 deg F grassland vs. rivermile 59.6 redwood 62 deg water 90 deg air.

Upper Eubanks, due to high human density, dries up every year - bad choice for model, Big Finley better, Redwood Sciences Laboratory intermittency study 1994-8.

Overwidening equals shallow. Indirect effect (x2).

Tributary water flowing into river has local large effect. Please note extent of cooling in volume and degrees equal steelhead.

Note that riparian forest is more endangered than ancient conifer.

RESPONSE: Comments noted. Upper Eubanks was chosen because of the availability of data. Big Finley Creek did not offer the same opportunity. The upper Eubanks Creek modeling exercise is meant to demonstrate the importance of stream shade on stream temperature, which it does.

Comment 4-25: Simulation of Stream Temperatures. Welsh (Redwood Sciences Laboratory) finds 10° temperature decrease by understory about 20 feet, 20° with 100 foot conifer overstory.

RESPONSE: EPA and NCRWQCB are aware of the work of Dr. Welsh and others. However, the information that the comment refers to has not been published or released, and therefore we did not consider it. When or if the information becomes available the NCRWQCB will consider it in future phases of the TMDL process.

Comment 4-26: Importance of Sediment. An extreme on sediment continuum includes subsurface flow (my and salmon nightmare). One problem with stratified pools is lack of mixing of oxygen; tributary confluence pools, intergravel cooling and backwater pools with seeps are better refugia, as evidenced by the presence of juvenile steelhead.

RESPONSE: Comment noted. The TMDL and TSD acknowledge the importance of sediment conditions on stream temperatures.

Comment 4-27: Table 4-1. All reaches listed in Table 4-1 need to be identified by river mile. Wailaki 80% shade, Hidden Valley 10%, Queen 60% - reach too diverse to extrapolate - five temperature sites present. Woods simulate worse case? Opposite true. Coho salmon found fall 2001 in Woods, Wailaki, Yew, Big Finley.

RESPONSE: The reaches in Table 4-1 of the TMDL are identified in Figure 2.3 in the TSD. Although five temperature sites existed in the Wailaki to Queen segment of South Fork Bear Creek, efforts to procure the data files from the Bureau of Land Management and Mattole Salmon Group were unsuccessful. Neither the EPA TMDL nor NCRWQCB TSD identify Woods Creek as a "worst case"

in terms of temperature impairment. The commentor may be misinterpreting information provided in the table and accompanying discussion, which identifies Woods and Nooning creeks as having the poorest model calibration.

Comment 4-28: Revegetation. Volunteer revegetation can occur if grazing fenced (NCWAP deleted all fencing).

RESPONSE: Comment noted.

Comment 4-29: Figure 4-5. "Klamath Mixed Conifer and Ponderosa Pine Forest" is dubious, some sugar pine on King Peak, but more apropos would be Riparian Mixed Conifer - Cottonwood with Alder/Willow, tree height 30 meters (100 feet).

RESPONSE: The TMDL analysis and load allocations are based on the Calveg 2000 vegetation database, which includes the montane riparian classification. EPA and NCRWQCB acknowledge that the Klamath Mixed Conifer and Ponderosa Pine Forest is not a common vegetation type in the Mattole River watershed.

Comment 4-30: Figure 4-9. Stream length of 350 miles on a 61 mile Mattole with 1600 (?) miles of blue line streams?

RESPONSE: Figure 4-9 represents the total length of streams in the watershed with specific amounts of effective shade. Values are presented for both current vegetation and adjusted potential vegetation conditions. For example, roughly 180 miles of stream in the watershed have between 75% and 85% effective shade (with current vegetation), and a little over 300 miles of stream in the watershed would have effective shade between 75% and 85% if vegetation was at its adjusted potential condition throughout the watershed.

Comment 4-31: Table 4-2. Large woody debris decreases runoff, decreases floods, increases bank stability, and decreases sediment and temperature.

RESPONSE: Comment noted.

Comment 4-32: Implementation and Monitoring Measures. There should be no riparian tree removal in watercourse and lake protection zones. Should protect riparian from grazing by fencing and willow then cottonwood will reestablish themselves.

Mattole Salmon Group has 36 hobo temps and Sanctuary Forest has 35 more, but the data is public and many landowners prefer private data. Continued monitoring is the intent, but it requires funding.

RESPONSE: Comment noted.

Comment 4-33: References. Mattole Salmon Group reports to DFG and Bureau of Land Management include: 22 years spawner surveys, 12 years DSMT, 22 years restoration, 10 years dive surveys, 7 years summer steelhead surveys (with temperatures), 10 years temperature monitoring with habitat and flow and dives for coho and chinook numbers, project evaluation report pre and post habitat type with dives for abundance and habitat utilization, 6 years bugs at 21 sites in spring/fall, 22 years trap and rearing reports, 2 five year plans (1995-2000 and 2001-2006).

You are missing references from Redwood Sciences Laboratory: Leslie Reid (no intermittency in old growth forest, etc.), Welsh et al (M. Roche) 2001 (in TSD).

RESPONSE: The References section is not meant to be a bibliography of all available information describing conditions in the Mattole watershed, rather the references section identifies the information sources cited by the EPA in the Mattole River TMDLs. A summary of information related to the Mattole Salmon Group is provided in the TSD (section 2.3.6). The EPA believes that the information presented and/or cited is sufficient to provide the basis for establishment of the Mattole River TMDLs.

Comment 4-34: Glossary. Pool tail out = pool tail crest = riffle crest. Riffle is fast, shallow, drop in elevation. Sediment is 10,000 year old soil which has bled into streams. Thalweg profile is longitudinal profile (need example Merritts 1994). Watercourse is stratified deposit.

RESPONSE: Comment noted.

Comment 4-35: General. Approach is ambitious. NCWAP did not include temperature, sediment or salmon in model. NCRWQCB is attempting sense by extrapolating much, modeling logically and simulating ideal. I wish you well and the living Mattole great abundance and diversity.

RESPONSE: Comment noted.

The remaining comments from this commentor pertain specifically to the TSD. The responses provided have been coordinated with NCRWQCB staff.

Comment 4-36: Grazing. You are to be congratulated for not deleting all references to grazing as NCWAP did.

RESPONSE: Comment noted.

Comment 4-37: Models. Corroborate your models with presence of coho and chinook or steelhead or lack of water.

RESPONSE: Comparing the model's predicted water temperatures to data regarding the presence of fish would not affect the temperature TMDL analysis (see response to comment 4-6). In regards to

water, all modeled reaches (with the exception of the upper South Fork Bear Creek) were compared to measured water temperatures. Thus, these reaches had water in them for the period modeled.

Comment 4-38: Lower Valley. "In the lower valley," if compared to EPA TMDL, omits upper (river mile 61 - 42.8) and middle (river mile 42.8 - 26.5).

RESPONSE: Comment noted.

Comment 4-39: Vegetation. Some note should be made about the tax on standing timber as a contributor to timber harvesting.
Forest conversion to grass was maintained by annual burning alternating sides of the river up to Honeydew.

RESPONSE: NCRWQCB staff have added reference to timber tax to the TSD. Forest conversion is discussed in section 3.2.2.3 of the TSD.

Comment 4-40: Hydrology. Typical summer flows are 20 not 60 cfs. Why does a water (flow) year run October to September and rainfall year run July to June?

RESPONSE: Department of Water Resources' (DWR) analysis of USGS gaging records shows that the mean seven day minimum of the mean of daily mean flow over the period of record is just over 28 cfs, and that 20 cfs is rare. The TSD has been modified to reflect this information.

Water and rainfall year reporting is based on long-standing conventions.

Comment 4-41: Figure 1.9. 1975 flow of 62,000 cfs is hard to believe.

RESPONSE: The information comes from USGS gaging data records.

Comment 4-42: Tectonics. Do not forget the Mattole Shear Zone up Honeydew Creek to town.

Add (e) mature roots form soil pipes that charge groundwater like a firehose (increased summer flows, decreased runoff).

RESPONSE: Comment noted. There are several major tectonic features in the Mattole watershed that are not shown on the figures. TSD has been modified to refer the reader to USGS map MF-2336 (McLaughlin et al., 2000), which includes a map showing current interpretation of major tectonic features of the watershed in a larger regional context.

Comment 4-43: Early Exploration. First ~~Western~~ European explorer. In eight years extirpated.

RESPONSE: Comment noted.

Comment 4-44: Timber Harvest. The runoff from deforestation was 100 times the runoff from rainfall in 1941. The loss of 10,000 year old soil not only prevents healthy regrowth, but rages wildly unconfined, overfilled, destabilized riparian banks downstream.

RESPONSE: Increased sediment delivery from management activities was the reason for listing the Mattole River watershed as impaired by sediment

Comment 4-45: Grazing. River bar common includes grazing "long pasture."

RESPONSE: Comment noted.

Comment 4-46: Marijuana. Rumored economy of marijuana has shifted to urban indoors with CAMP/MET listing Humboldt only #7 in state.

RESPONSE: Comment noted.

Comment 4-47: Flow. Value of 2593 acre-feet/year is illuminating, but what % of total Mattole output is that? Diving reveals about an intake/mile, but upslope are probably 10 times. This is your biggest black hole, what good is habitat without flow? If 34 of 73 tributaries dry up plus 12 miles in Headwaters, you need my research and to monitor in early fall, for lowest flows are limiting factor, no salmon nursery!

RESPONSE: According to the DWR NCWAP analysis of USGS data, the mean annual yield of the Mattole River watershed is 949,000 acre-feet, therefore the total of permitted and registered pre-1914 water rights equals 0.27% of the mean annual yield. In the driest water year on record total yield was just over 100,000 acre-feet, so in that year permitted and registered pre-1914 water rights accounted for approximately 3% of the annual yield.

This analysis provides the technical basis for TMDLs to address sediment and temperature impairments. It is not intended to be a limiting factors analysis.

Comment 4-48: NCWAP Subbasins. Use of NCWAP subbasins is flawed as five basin gerrymander confuses cumulative effects assessment without noting sediment, temperature and salmon.

RESPONSE: The subbasins delineated by NCWAP report were chosen by the NCRWQCB TMDL development team so that TSD results could be compared to information presented in the NCWAP report. It is unclear why the commentor believes the five subbasins confuse cumulative effects. Temperature, sediment, and salmon data are reported for all subbasins.

Comment 4-49: Salmonid populations. Mattole Restoration Council used Mattole Salmon Group five year plan 1995-2000's spawner survey 15 year trends. Mattole Salmon Group estimates pre 1960

populations of 10,000 chinook salmon, 4,000 coho salmon, and 50,000 steelhead. Trends are flat and remnant.

RESPONSE: Comment noted.

Comment 4-50: Dive Surveys. Dive survey after 1995 and 1997 flows [observed] scoured 18 foot holes in estuary and 7000 chinook survived, the only time 1987-2002.

I was at the electroshocker in 1994 Redwood Sciences Laboratory study, the unnamed tributary is Hart's Creek downstream of Lil Finley. Eubanks, Lil Finley and Ancestor dried up by October.

Mattole Salmon Group does spawner surveys and DSMT, plus five other research, rearing and restoration. Besides counting salmon, Mattole Salmon Group restores instream habitat by bank stabilization and securing remnant large woody debris. These structures have been monitored over time for structureal integrity and affect salmonid usage. The Mattole is monitored for air and water temperatures, each site for 6 month noting habitat, flow and which/how many salmonids in spring and fall. Comprehensive summer steelhead dive over few days and 45 miles reveal incidental temperatures, steelhead aggregations at thermal refugia, nearly all at tributary confluences. Four years of sediment monitoring by McNeil and V* at five sites adds to habitat typing embeddedness as well as studies by DFG (1990), Pacific Lumber Company (1991-3), and Knopp (1993). Aquatic macroinvertebrate samples have been taken over six years at 21 sites spring and fall with Bureau of Land Management National Laboratory analysis. I was the first to do pre and post project habitat typing and added dives to discover 80% loss steelhead, 2000 chinook, and 300 coho in headwaters over three warm days of September 1999. Which points to human density, as it was the only reach to dry up cold, because of limiting factor of no salmonid nursery. Mattole Salmon Group does research to understand salmon because we have by rearing less than 1% wild chinook prevented extinction. By oversummering native chinook, and DSMT-rescued wild chinook, Mattole Salmon Group has been compensating for lack of headwaters, mainstem and estuary nurseries that are non-viable for 22 years. An outmigrating 3 inch chinook has a 15% chance of survival in the ocean, compared to 85% chance as a 6 inch chinook. Your version of Mattole Salmon Group omits 14 years of my unique research, my arduous rearing and restoration.

RESPONSE: TSD section 2.3.6 is meant to be a summary of Mattole Salmon Group information and activities as it relates to fish presence, absence, and abundance. The document directs the reader to the California Department of Fish and Game's "Assessment of Anadromous Salmonids and Stream Habitat Conditions of the Mattole River Basin" for further detail. Embeddedness, McNeil, and V* data, including data from Knopp's 1993 study, are summarized in section 3.1.2. Although, the NCRWQCB believes that the information presented and/or cited is sufficient to provide the basis for establishment of the Mattole River TMDLs, any data submitted will be considered in future phases of the TMDL process.

Comment 4-51: Hatchery Fish. Eggs and alevin are incubated in hatch boxes. After ~~hatching~~ swimup fry are reared 6 ~~weeks~~ months (very few spring release, none in last five years). Since the estuary reflects cumulative effects it will be the last to heal and Mattole Salmon Group will rear until 25% (2500) chinook return over seven years.
The problem with rearing even in small numbers is water, only two places in the Mattole flow over 30 gallons/minute in early fall, a Chemise Mountain tributary and old growth Mill Creek.

RESPONSE: NCRWQCB has revised the TSD to reflect the comment.

Comment 4-52: Salmonid Life Cycle. Salmon have at least four phenotypes or life history patterns: headwaters, mainstem and estuary rearing are 85% more preferable to 15% survival as premature outmigrant in the spring. Smoltification happens only in the estuary by saltwater contact in a few days.

RESPONSE: Comment noted.

Comment 4-53: Sediment impacts on salmonids. Fines clog and erode to hemorrhage capillary beds in gills of young salmon. On the sediment continuum my and salmon nightmare is "subsurface flows" unavailable for life.

RESPONSE: NCRWQCB has revised the TSD to reflect the comment.

Comment 4-54: Table 2.2. Add increased runoff and increased fines that erode gills as potential impacts to salmonids during winter rearing.

RESPONSE: NCRWQCB has revised the TSD to reflect the comment.

Comment 4-55: Table 2.3. Table is missing Welsh (Roche) MWAT of 16.8°C, which is the only study to prove viability by presence of wild chinook and coho. Single point maximum 68°F (20°C). (Roche and FEMAT) could give context to incidental snapshot infrared temperatures.

RESPONSE: The work of Welsh and others (2001) is discussed in section 2.4.5.2. Information presented in Table 2.3 is congruent with the work of Welsh and others (2001). Other comments noted.

Comment 4-56: Sediment Conditions, page 2-14. Sediment affects five largest (Lower North Fork, Upper North Fork, Bear, Honeydew, Squaw) as well as mouths of 29 more dry tributaries and 12 miles of Mattole headwaters.

The amount of sediment mobilized by the 1955 and 1964 floods was so huge because the hillsides were denuded, causing runoff to increase by a factor of 100.

Unmentioned road-initiated mass movements include: CA Coast Highway 1 north of King Peak and the heart shaped slide below North Slide Peak, which is bound by old growth tourniquet still slowing

sediment (belching only in floods). In contrast, county road east of Honeydew caused "the 1983 Honeydew Slide" that dammed the Mattole creating a 30 foot drop (the only rapid in the Mattole still).

RESPONSE: Comment noted.

Comment 4-57: Temperature Conditions. Mattole Restoration Council (1995) was me researching by habitat typing diving cross sections and taught me that (a) estuary at beach and North Bay were less than 68° but unutilized by fish, (b) estuary along willow - deepened banks provided 80°F steelhead nursery of 20 - 100,000 annually except three years when eutrophication (low flow high nitrogen) occurred after algal blooms that filled water column then died leaving a dead zone with (bacterial?) white felted mat carpeting an empty lagoon (with Dave Fuller, Bureau of Land Management). Does TIR provide depths as well as temperatures? While you cite Dorothy Merritts (1994), an example of the longitudinal profile to Honeydew (I helped) should be included for clarity and reference is Trush 1999 and future. You need to define who (steelhead only) utilizes relative-refugia.

RESPONSE: Comments noted. TIR survey data provides surface temperatures only. Longitudinal profile mentioned refers to the longitudinal temperature profile from TIR survey.

Comment 4-58: Table 2.5. Since both my NCWAP corrections were ignored, and now here they are again: wrong mileages, 8 are for Mattole not tributaries, none of tributaries denote how far upstream (river mile 42.8 and .6), 6 are dry, Mill Creek has never been 71° so river mile 1 = mainstem. Poor, marginal and good are meaningless, my annual summaries showed temperature numbers, species, number of pools as steelhead rear in 80° and chinook and coho less than 68°F. This quantification, not simulated extrapolated models, give necessary input for your recommendations that landowners need to understand.

RESPONSE: All sites shown in Tables 2.5 and 2.6 are mainstem Mattole sites. Tributaries mentioned are major upstream tributaries. NCRWQCB disagrees that the habitat quality descriptors are meaningless. The presence of juvenile steelhead in 80° water does not indicate that the habitat is good or marginal, however studies presented in Table 2.4 indicate that 80° water provides poor habitat.

Comment 4-59: Table 2.6. The watercourse locations (river mile) in Table 2.6 are wrong, just as they are in Table 2.5.

RESPONSE: See response to comment 4-58.

Comment 4-60: Table 2.7. You use Pacific Lumber Company Sustained Yield Plan stations 1997-9, but ignore same 1990-93 that could have shown more depth and trends during current desertification of Rainbow Ridge, the last three percent of Mattole old growth conifer.

RESPONSE: NCRWQCB does not have 1990-1993 MWAT data for these locations.

Comment 4-61: Eastern Subbasin. Eastern subbasin includes Westlund river mile 37.1 + 1 had coho in spring not fall. Welsh only used 1998-9 fall instead of 70 sites over ten years, Mattole Salmon Group 2001 FG8085.

RESPONSE: NCRWQCB has revised TSD to correct Westlund Creek river mile identifier. Other comments noted.

Comment 4-62: Southern Subbasin. On page 2-22, ~~Eastern~~ Southern Subbasin, Gary ignored all these dry up, not best!

Table 2.10, ~~Eastern~~ Southern.

RESPONSE: NCRWQCB has revised TSD to reflect the comment.

Comment 4-63: Table 2.12. Coho presence 2001 Woods, Big Finley, Wailaki. Table omits temperature data, for locations 11, 12, and 13 miles upstream on the tributary entering the mainstem at river mile 42.8, that vary 15°. It should be noted steelhead only existed prior to 1995 flood that blocked access.

RESPONSE: NCRWQCB does not have MWAT data for the sites mentioned. Efforts to procure the data files from the Bureau of Land Management and Mattole Salmon Group were unsuccessful. Other comments noted.

Comment 4-64: Oxygen and Chemical Pollutants. Anoxia present when even the algae is dead. Intermittancy, especially in headwaters bedrock, denoted no oxygen being entrained in dry riffles, a dead zone in early fall describes 34 tributaries and 12 headwater miles. I continued diving past 1995 and dissolved oxygen were done, thermal stratification occurred at 8 feet and the lagoon of 1995 and 1997 contained 6-18 foot pools that aggraded subsequently. The lagoon has oxygen entrained at river mile 0 by wind and river mile 1.2 by last riffle, in between since 1998 has been a gravel desert, shallow, warm and algal.

RESPONSE: Comment noted.

Comment 4-65: Instream Indicators. Calibrate to each other over 10 units (like divers) or to McNeil - V* in reach for embeddedness. Turbidity only shows that event, is very expensive in field and very risky (Mattole Restoration Council had two near drownings in February 1998 while collecting). Embeddedness, McNeil and V* show cumulative effects that salmon encounter and are relatively cheap and safe.

RESPONSE: NCRWQCB has conducted turbidity monitoring safely and relatively inexpensively in other watersheds. Expenses associated with turbidity monitoring are often far less than McNeil and V* sampling when labor costs are accounted for. Other comments noted.

Comment 4-66: V*. Mattole Salmon Group 1998 South Bear V* (.17), 1999 Mattole 57.1 (.209) and 61 (.25) V* and McNeil. Susan Hilton taught Mattole Salmon Group and Bureau of Land Management V*. Source of river mile 61 was county road orange clay that Headwaters Coop is trying to mend in 2002.

RESPONSE: These data, if submitted, will be used in future descriptions of indicator data.

Comment 4-67: Mill Creek (p. 3-6). There are three Mill Creeks in Mattole: river mile 56.2 Upper Mill, river mile 5.4 East Mill, river mile 2.8 Mill. Please discern.

RESPONSE: The Mill Creek referred to drains to the Mattole River at approximately river mile 2.8. NCRWQCB has revised the TSD to reflect this distinction.

Comment 4-68: Aquatic Insect Production. Bugs ignored by Mattole Salmon Group/Bureau of Land Management 6 years x 21 sites x 2 spring and fall = 252, plus Pacific Lumber Company Sustained Yield Plan 1990-3 4 years x 5 sites. We had trouble finding reference conditions or discriminating "good," but Tom Weseloh states "Mattole has highest density of caddis on California Coast."

RESPONSE: The information mentioned was not available to NCRWQCB during preparation of the TSD.

Comment 4-69: Large Woody Debris. DFG 1 foot by 6 feet, FEMAT's PACFISH 1 foot by 10 feet counts instream or bankfull.

RESPONSE: Comment noted.

Comment 4-70: Storm-proofing. "Storm-proofing" arrogantly ignorant.

RESPONSE: Comment noted.

Comment 4-71: Pages 3-9 through 3-11. All conditions cited have been repaired in last four years.

RESPONSE: The section of the TSD cited in the comment pertains to the description of watershed indicators and current conditions in the watershed with respect to those indicators. EPA and NCRWQCB interpret the comment to mean that the commentor believes that the problems identified in the description of current conditions have been repaired. The commentor did not provide information to support this assertion. Hence, the TSD is retaining the original language. Regardless, EPA and NCRWQCB believe that the watershed indicators described are appropriate.

Comment 4-72: Disturbed Area. ~~areal~~ aerial.

RESPONSE: Areal refers to a quantitative measure of a surface; aerial refers to something in, of, or done in the air. NCRWQCB stands by the current wording.

Comment 4-73: Sources of Sediment. Seismicity in incompetent rock with high uplift and high rainfall is doomed with ~~changes in vegetation~~ 80% loss of biomass, ancient productive soils and groundwater recharge, causing naturally high sedimentation rates 100 times worst with human extraction.

RESPONSE: Comment noted.

Comment 4-74: Table 3.2. No explanation why amounts do not add up at all from basins to total (29,800 vs. 8000). Credibility?

RESPONSE: Figures are in units of tons per square mile per year, which are not additive. "Entire Watershed" column is the estimated averages for the entire watershed.

Comment 4-75: Natural Sources. ... altering ... ...for many ~~years~~ decades.

RESPONSE: Comment noted.

Comment 4-76: Slope stability. Add (e) mature tree roots form soil pipes that entrain runoff into groundwater like firehoses.

RESPONSE: The comment does not relate to the sentence referred to by the commentor, which describes how forests stabilize slopes. NCRWQCB is retaining the original language in the TSD.

Comment 4-77: Page 3-17. Plus human overuse, even with normal rainfall, causes dry reaches.

RESPONSE: Comment noted.

Comment 4-78: Timber Harvest. Timber harvest plans deny groundwater recharge and decrease summer low flows. Most roads built for timber harvest!

RESPONSE: Comment noted.

Comment 4-79: Livestock Management. Great discussion of grazing influences. Pre-historic to 1942 grasslands were 10-15% of Mattole with small burns by natives, forest succession is natural after slides, floods, blow down or quakes. Grazing should be fenced out of riparian, irrigated if necessary, for mature riparian forest to cover 50% land surface. The Mattole is a temperate rain forest with more than half of its lands over 1000 feet elevation and 100 inches of rain per year.

RESPONSE: Comment noted.

Comment 4-80: Page 3-23. 1996 and 2000 aerials reflect decreased land use, despite six major earthquakes 1991-92.

RESPONSE: Comment noted.

Comment 4-81: Stream Heating Processes. Radiation of heated grassland air mass adjacent to canopied riparian, "edge-effect" (Welsh), causes headwaters to warm river mile 58-52, never to cool downstream.

RESPONSE: Comment noted.

Comment 4-82: Table 4.1. Table omits cottonwood (*Populus fremontii*), the tallest (60 meter) riparian structural element, more endangered than redwoods.

RESPONSE: NCRWQCB has revised TSD Table 4.1. Based on the references cited in the table, it appears that the cottonwood observed in the Mattole is black cottonwood.

Comment 4-83: Eubanks Creek. Upper Eubanks dries upstream first due to human density.

RESPONSE: Comment noted.

Comment 4-84: Effects of Forest Practices. Amen! California Forest Practice Rules do not ensure. Thank you.

RESPONSE: Comment noted.

Comment 4-85: Infrared sites. Wish four infrared sites had river mile.

RESPONSE: NCRWQCB will add river mile.

Comment 4-86: Margin of Safety. Margin of safety is synergy of temperature decrease and sediment decrease and flow decrease.

Riparian also increases streambank stability.

RESPONSE: EPA and NCRWQCB acknowledge that dewatering is a serious salmonid habitat issue, however the task of the temperature TMDL is to evaluate the impacts of land use on stream temperatures, and not to investigate all factors impacting salmonid habitat. The State Water Resource Control Board's Division of Water Rights is the entity responsible for regulation of water quantity.

Comment 4-87: Glossary. Cable yarding creates gullies on fall-line.

Mattole Salmon Group (MSG).

Riffle: fast, shallow, drop in elevation.

RESPONSE: It is not appropriate to include gullies in definition of cable yarding. NCRWQCB has added Mattole Salmon Group and revised the definition of riffle.

Comment 4-88: References. 1973 Department of Water Resources "Character and Uses Mattole River"

Two Mattole Restoration Council Dynamics, Mattole Restoration Council 1989 "Elements of Recover."

Mattole Salmon Group: hatch box 1981-2001, spawners 1981-2001, DSMT 1993-2001, Restoration 1981-2001, habitat type 1991-2000, bugs 1996-2001, summer steelhead dives 1996-2001, coho temperature dives 1998-2001, V* 1998-2000, project evaluation 1999 and 2000.

RESPONSE: The DWR and MSG documents are not referred to in the TSD. NCRWQCB will remove one of the MRC 1995 references.

Comment 4-89: Page A-1. Page A-1 is poorly written:
~~Timber~~ Shelter Cove

2 forces Pacific under North American plus San Andreas push north causes uplift greater than north

250,000 years ago in San Francisco

If 9 of every 10 inch uplift had not eroded King Peak would have been 40,000 feet.

Thousand foot lurches of punctuated equilibrium created 1000 foot marine wave terraces to river mile 26.

RESPONSE: Shelter Cove is correct.

Comment is not clear. TSD discusses only the major compressional tectonic force as that is the main source of uplift, which is the subject of the paragraph. Strike-slip motion on the San Andreas is real, but less important in the uplift.

Interesting and true, but this displacement is the result of strike-slip movement and not the major cause of uplift.

The commentor's reference to King Peak is one graphic way of describing the amount of erosion. The TSD uses a different image.

A thousand vertical feet between preserved terrace remnants does not mean thousand-foot lurches. Such an image is one way to visualize uplift, but there is no evidence that this is what actually happens. True, some of the higher terrace remnants in the valley are of marine origin, and that will be explained in the TSD.

Comment 4-90: Page A 11-2. Why does current equal potential except for shade?

RESPONSE: The phenomenon of microclimate change associated with changes in riparian structure has been documented and explained, however there is currently no way of predicting a change in air temperature, wind speed, or relative humidity resulting from a change in riparian structure. To adjust microclimate variables without a firm scientific basis would be conjecture.

Comment 4-91: Maps. Nine of ten maps omit Ettersburg with its human density and identity.

Figure 1.3 is way off. Rainfall is related orographically to elevation, at 1000 feet equal 100 inches per year. Your (?) isohyetal map is way off: both Wilder 3x and Paradise 4x more rain. Note 22 years records Trowers and 30 years Stevenson respectively.

Figure 1.5 fails to note three major (>6.9) quakes in 18 hours.

RESPONSE: Ettersburg has been added to maps included in the revised TSD.

The TSD is retaining the rainfall contour map produced by the California Division of Forestry, because this seems to be the best single source available for the watershed. The difference afforded by the added data point would not significantly affect the analysis.

Figure 1.5, a figure published by Humboldt State University, shows the reported intensity of the first and most severe shock, which was centered virtually under Petrolia. Section 1.3.1 (page 1-5) mentions the two other strong earthquakes, which were centered offshore, and which Humboldt State reported as magnitude 6.6.

Commentor 5: Stephen Sterling, California Geological Survey

Comment 5-1: Comparison of TSD and NCWAP. The fundamental question that needs to be addressed is why there is a divergence between the Mattole TSD and the NCWAP Mattole River Report. Specifically, concerning the sediment source information. The CGS NCWAP team has determined that natural sediment sources are the biggest contributor in the Mattole River watershed. However, the TSD seems to suggest that anthropogenic factors are the largest contributor of sediment in the basin.

This discrepancy has large implications for future land management decisions and it will be difficult for the Mattole Watershed stakeholders to formulate land use policy and practice if this ambiguity is not resolved.

RESPONSE: The North Coast Watershed Assessment Program (NCWAP) is a State of California effort to provide a process for collecting and analyzing information to characterize current and past watershed conditions for several North Coast watersheds. The California Geological Survey (CGS) is one of the state agencies participating in the NCWAP.

It is likely that the discrepancy perceived by CGS between the Mattole TSD and the NCWAP Mattole River Report, concerning the sediment source information, is attributable to the different purposes of the two analyses. Based on review of the NCWAP Mattole River Report, Appendix I Geology, it is our understanding that the purpose of the CGS mass wasting inventory was to identify unstable areas in the watershed by mapping mass wasting features to aid in watershed assessment and land use planning. The purposes of the Mattole TSD are (1) to estimate current sediment discharges to the watercourses that have negatively impacted the beneficial uses and (2) to determine discharge reductions necessary for attaining and maintaining water quality standards in the Mattole River and its tributaries.

NCRWQCB staff and consultants used aerial photo analysis of air photos from 1941 to 2000, current field measurements and surveys of selected stream and road segments, and peer-reviewed and published literature to estimate current sediment delivery amounts and rates from natural and anthropogenic sources. In order to estimate current sediment deliveries from large (>10,000 square feet) mass wasting features, NCRWQCB staff used aerial photo analysis. Only landslides that had occurred between 1984 and 2000 and delivered to receiving waters were included in the TSD analysis. For landslides that had occurred earlier than 1984, Regional Board staff only considered deliveries from the eroding portions. Where they observed clear associations between land use and particular landslides, NCRWQCB staff attributed landslide delivery to land use. Where such associations were not obvious, NCRWQCB staff attributed deliveries to natural sources.

NCRWQCB staff conducted field surveys rather than air photo analysis in order to estimate deliveries from smaller landslides (<10,000 square feet), because of the difficulty in detecting and accurately measuring these smaller features using aerial photo analysis. NCRWQCB staff estimated deliveries from mass wasting features using the field survey data, and estimated deliveries from surface erosion using the field survey data, the Washington Forest Practices Board's Standard Methodology for Conducting Watershed Analysis, and the USDA NRCS Universal Soil Loss Equation.

NCRWQCB staff combined estimated deliveries from mass wasting with estimated inputs from surface erosion in order to develop the final sediment source analysis in the TSD.

In the Mattole TSD, natural sediment yield accounts for approximately 36% of the total sediment delivery in the Mattole watershed while human-caused sediment delivery accounts for 64% of the sediment delivery in the watershed, or an amount greater than the natural load. The Mattole TSD analysis shows that timber harvest activities and road-related processes are the dominant sources of current (1984-2000) sediment delivery in the watershed. These amounts, indicating that human caused sediment delivery exceeds natural sediment delivery, are comparable to other completed studies in sediment impaired watersheds on the North Coast, such as the Redwood Creek Sediment TMDL, the

Noyo River Sediment TMDL, the Gualala River Sediment TMDL, the Big River Sediment TMDL, and the Ten Mile River Sediment TMDL. Additionally, it was our understanding that NCWAP analysis did not include land use associations, thus it is unclear how it can be concluded that natural sediment sources are the largest contributor.

It appears that for NCWAP analysis, CGS mapped relict dormant landslides (defined by CGS as those appearing to have not moved within the last 150 years) and historically active slides (defined by CGS as those appearing to have moved within the last 150 years), using only 1984 and 2000 aerial photo sets. CGS did not conduct any field surveys to assess small features, which can be missed in aerial photo analysis because of canopy cover. CGS did not evaluate contributions from surficial erosion in their analysis. It also appears that CGS did not conduct a detailed sediment source analysis for NCWAP. In the absence of a sediment source analysis, it is unclear how CGS identified and determined the natural and anthropogenic components of their mapped landslides. CGS did not present any clear documentation of natural sources, anthropogenic sources, nor methods used for quantifying landslide volumes in the November 2002 NCWAP Mattole report or Appendix I Geology.

It is virtually impossible to compare the NCWAP and TSD findings related to sediment sources and deliveries to surface waters because:

(1) The NCWAP findings do not include a detailed and complete sediment source and delivery analysis;
(2) The NCWAP report does not include a description of methods and rationale used to differentiate between natural and anthropogenic sources in the NCWAP report; and
(3) CGS used a much larger timeframe of analysis for the NCWAP report than that which was used for TSD (150 years for NCWAP vs. 18 years for the TSD).

EPA believes that the NCRWQCB staff used scientifically appropriate methods to develop a credible sediment source analysis for the TSD. It is EPA's understanding that, once EPA establishes the TMDLs for Mattole as mandated by the consent decree, the NCRWQCB will use them to formulate an implementation strategy with input from Mattole watershed stakeholders to restore and preserve the beneficial uses of Mattole River and its tributaries.

It is EPA's understanding that landslide analysis by CGS for NCWAP will be used to guide land management decisions to reduce adverse impacts from land use in the watershed, especially from land use on unstable terrain.

In conclusion, EPA believes that there is useful information in both assessments and that the information in both these assessments will be helpful to guide land management and restoration activities. EPA suggests that for future TMDL and NCWAP assessments, staff of NCRWQCB and CGS work together to ensure that the results from the NCWAP assessments can be applicable to the data needs for the TMDL assessment, as was intended by the State legislature.

Comment 5-2: TSD v. NCWAP analysis. The estimated Road-Related Mass Wasting for Dry Creek Planning Watershed (PW) is a large number (5,900 tons/mi^2/yr) in comparison to all other sources in the basin. Yet the TSD found NO sediment delivery from natural surface erosion and landslides in this PW (see table 3.5). It would be helpful if the report included maps showing the mapped landslides in relation to roads. Please consider the following:
- CGS mapped numerous landslides in this PW, but less than a third were associated with roads.
- This PW includes the Honeydew landslide, which we don't believe has been attributed to a road. How is this slide included in the TMDL calculations?
- Figure 3.1 shows most of the mapped landslides in Dry Creek as first appearing on the 1965 photos. Could it be that the 1964 flood had something to do with this, and not everything was related to roads?

RESPONSE: For Dry Creek planning watershed our analysis estimates 5,900 tons/mi^2/yr of road related mass wasting with no natural erosion for the 1984-2000 time period. The aerial photo analysis conducted by the Information Center for the Environment (ICE, Department of Environmental Science and Policy, UC Davis), estimated road related mass wasting for Dry Creek planning watershed as 5,578 tons/mi^2/yr, for the 1984-2000 period. The analysis conducted by ICE for the planning watershed included review of air photos from 1941, 1965, 1984, 2000, and management associations were identified for all landslide features >10,000 sq. ft.

The NCRWQCB staff estimated road related sediment delivery, for the 1984-2000 period, in the Dry Creek planning watershed using the Washington Forest Practices Board's Standard Methodology for Conducting Watershed Analysis. Associations were identified for all landslide features <10,000 sq. ft. The estimated sediment delivery rates were 49.4 tons/mi^2/yr (from road ditch and road bank sediment delivery), and 296 tons/mi^2/yr (from road surface erosion). These rates were added to the mass wasting rates that ICE estimated (5,578 tons/mi^2/yr) to yield 5,900 tons/mi^2/yr for the Dry Creek planning watershed, as presented in TSD Table 3.9. The analysis for the 1984-2000 period indicated that all of the features showing activity also showed an association with anthropogenic activity for the Dry Creek planning watershed.

NCRWQCB staff has generated maps showing the mapped landslides in relation to roads for Rainbow Ridge, Cow Pasture Opening, Dry Creek, Bridge Creek, and Squaw Creek planing watersheds. We have included these maps in the revised TSD document.

The statement by CGS that less than a third of the landslides in this PW were associated with roads does not appear to be documented in the NCWAP Appendix, Report on the Geologic and Geomorphic Characteristics of the Mattole Watershed, dated 7 November 2002. The only landslide associations identified were historically active landslides (less than 150 years old) from 1984 and 2000 air photos for the entire watershed. On page 30 of the Appendix, CGS states, "Approximately 32% of all mapped historically-active debris slides (by count) were observed proximate to roads. This does not necessarily mean that the road caused the landslide, only that we observed a road near the debris slide." Again, the time scale and level of detail do not compare to the NCRWQCB's analysis. No

specific associations were reported by CGS for any of the planning watersheds that were analyzed by ICE.

Most of the mapped landslides in Dry Creek first appeared on the 1965 photos, and this is attributed to the high intensity ground-based timber harvest of the time, in conjunction with the large storm events of 1955 and 1964. In the TSD aerial photo analysis, sediment delivery from all landslides first appearing in 1984 photos or later were included in the sediment source analysis. In addition, landslides that first appeared before 1984 were included if they had not re-vegetated. Vegetation condition was used as an indicator of sediment delivery condition, with revegetated slides not considered as current sediment delivery sources. Current estimated sediment delivery from "unhealed" landslides, which appeared prior to 1984, was included in the NCRWQCB estimates for soil erosion using the USDA NRCS Universal Soil Loss Equation. Most current sediment contributions are from recent slides. The pre-1984 slides included in the analysis were attributed as natural and anthropogenic just like the more recent slides. Thus, the NCRWQCB analysis reflected natural conditions as well as management activity, which may have been followed by triggering events such as the 1964 flood.

The Honeydew Slide occurred prior to 1984 (it first appeared in the 1984 air photos). The sediment deliveries from the unstable portions of the landslide were included in NCRWQCB staff's time frame of analysis for current estimated sediment delivery (1984-2000). The management association for this slide was identified by the Information Center for the Environment (ICE, Department of Environmental Science and Policy, UC Davis) as road related (intersecting both road cuts and road fill prisms). Mass wasting quantification methods are described in the TSD document on pages 3-22 to 3-24.

Comment 5-3: Aerial Photo Analysis (3.2 to 3.3). CGS notes that in several places the TSD cites the names of individuals for credibility (e.g., Fay Yee and Russell Chambers). Presumably the un-named geologist mapping the landslides (with experience in air photo interpretation in the Mendocino Coastal area) is a licensed geologist, and has signed his or her name to this work, but is not shown. Also, if this information was developed for the TMDL analysis, it must be included in this document so it can be evaluated.

RESPONSE: The aerial photo analysis was conducted by the Information Center for the Environment (ICE, Department of Environmental Science and Policy, UC Davis), under the direction of NCRWQCB staff Donald Coates, Ph.D., R.G., geologist on the Mattole Sediment TMDL team. The description of the aerial photo analysis is on pages 3-21 to 3-25 of the TSD. The text of the TSD has been changed from "Fay Yee" to "CDF."

Comment 5-4: Usual mapping techniques. Seventh paragraph states that there is so much erosion and mass movement in the Squaw Creek PW that "usual mapping techniques are likely to underestimate sediment production." It is not clear why this would be the case.

RESPONSE: Usual mapping techniques are likely to underestimate sediment production, because mapping was conducted from aerial photos at a scale of 1:24,000, which poorly renders detection of

features smaller than 30 meters, such as road cutbank and fill failures. Furthermore, beneath the current forest canopy many smaller features are impossible to observe and describe from air photo analysis. Using selected road surveys, the NCRWQCB staff gathered more detailed and current information for Squaw Creek (and other planning watersheds) in order to refine the estimated sediment delivery rates generated from the aerial photo analysis.

Comment 5-5: Aerial photo analysis. Eighth paragraph states, "no erosion was identified in this planning watershed with respect to natural processes." This statement is not credible. NCWAP mapping shows abundant historically-active landsliding in this PW, particularly along inner gorges. From our data set, approximately 75% of the area mapped as active landslides from the 2000 air photos was observed to be not associated with roads.

RESPONSE: Within the time frame of the TSD analysis, all categorized slides were associated with anthropogenic activity, thus no current delivery was attributed to natural processes, and NCRWQCB staff believe that this is likely an underestimate of anthropogenic sources. See also response to comment 5-2.

Comment 5-6: NCWAP data. The TSD uses draft NCWAP references and data throughout the report. How will you incorporate the final NCWAP data as it becomes available?

RESPONSE: The TSD used the most current NCWAP draft documents available during the analysis phase of the TSD preparation. The State of California is responsible for developing measures to implement the TMDL. NCRWQCB staff will review and incorporate additional information, as time and personnel permit, during development of an implementation plan.

It was originally anticipated that the NCWAP Mattole Synthesis Report would be final well before the consent-decree-mandated due date for the Mattole TMDLs. It is hoped that for other listed watersheds in the North Coast region, where TMDLs schedules have been set, it will be possible to complete any anticipated NCWAP products well in advance of TMDL due dates.

Comment 5-7: Geology/Combined Geologic Units/Sources of Sediment (page 1-5). The discussion of logging, flooding, and fluvial features appears to be inappropriately located in the Tectonic Setting and Seismicity section. The discussion that should be included here is: what are the effects of recent earthquakes and corresponding base-level changes to the river. Figure A.1 of the TSD shows approximately 1 meter of uplift at the mouth of the Mattole River. Some of the Appendix discussion should be moved forward into the text.

RESPONSE: The paragraph on unregulated logging has been moved to TSD section 1.4.2, Timber Harvest, and some of the TSD Appendix discussion regarding Tectonic Setting and Seismicity has been included in TSD section 1.3.1.

Comment 5-8: Page 1-6. Soft, moderate, and hard terrains actually have greatest, intermediate, and least tendency toward slope failures, respectively. The current text in the TSD has this relationship inverted.

RESPONSE: The text has been corrected to read, "Soft, moderate, and hard terrains are geomorphic units that have the greatest, intermediate, and least tendency toward slope failures by mass movement."

Comment 5-9: Page 1-7. Percent of area column-values are not correct. Existing values include coastal planning watersheds west of the Mattole watershed, and include the bedrock units of very small extent in moderate category (TSD text claims this area not included). By our calculation, the correct values for this Table would be 25% soft, 27% moderate, 40% hard (91% total).

RESPONSE: According to the NCWAP Appendix, Report on the Geologic and Geomorphic Characteristics of the Mattole Watershed, dated 7 November 2002, on pages 25-26, soft terrain is 23% of the study area, moderate terrain is 34% of the study area, and hard terrain is 37% of the study area (94% total). These values are the same ones presented in the TSD.

Comment 5-10: Page 1-7. No mention or discussion of the 1955 flood and results.

RESPONSE: The effects of the 1955 flood are noted at the bottom of page 1-8 of the TSD.

Comment 5-11: Page 1-12. Table is taken from Draft NCWAP data "Highest Elevation." Data are wrong.

RESPONSE: Table 1.4 in the draft TSD was modified from Draft NCWAP (2002) Table 3, 19 July 2002, and it has incorrect elevations. The highest elevations have been corrected in the final TSD, using USGS Quads, to the following: Estuary, 1361 feet (from the Petrolia Quad, 1969); North subbasin, 3374 feet (from the Taylor Peak Quad, 1969); South subbasin, 2598 feet (from the Shelter Cove Quad, 1997); East subbasin, 3510 feet (from the Bull Creek Quad, 1969); and West subbasin, 4088 feet (from the Honeydew Quad, 1970).

Comment 5-12: (Page 3-13) Sources of Sediment - Summary and Conclusions. Top of second paragraph seems to suggest that the estimated sediment volumes were developed in the NCWAP report. This is not true.

RESPONSE: These estimated sediment delivery amounts were derived by NCRWQCB staff, and were not taken from the NCWAP report.

Comment 5-13: (Page 3-16) Sources of Sediment – Natural Sources. Text states "very steep slopes in terrains similar to those in the Mattole watershed would not have been able to form unless the slope were stabilized by the protection of dense forest (Sidle, 1985)." We disagree with this broad statement, and point to the coastal planning watersheds immediately west of the Mattole watershed.

Much of this area was not historically forested, yet the slopes are extremely steep, in fact steeper than the Mattole watershed average slopes.

RESPONSE: NCRWQCB staff support the statement by Sidle, as cited in the TSD, pertaining to the importance of forest cover in the Mattole watershed. The role of adequate ground cover, whether it is in the form of grassland, chaparral, or forest canopy, is critical for minimizing or eliminating detachment and transport of soil, i.e., erosion. The importance of cover is corroborated by the USDA NRCS Universal Soil Loss Equation and Water Erosion Prediction Program, and the Washington Forest Practices Board's Standard Methodology for Conducting Watershed Analysis. Cover intercepts rainfall and minimizes the kinetic forces upon the soil surface. Vegetative cover and the associated root structures stabilize the soil fabric, increase water holding capacity, utilize a portion of the available water in evapotranspiration, and reduce runoff. Vegetative cover and soil stability are integral components of a productive ecosystem. (The Mattole watershed is an ecosystem with damaged or reduced productivity, as evidenced by the fact that salmonid populations have been reduced by almost 90% since 1950 due, at least in part, to temperature and sediment impairments. These declines, associated with habitat impairment, are an important reason leading to the listing of these watersheds and the development of the TSD and TMDLs.) The Mattole Restoration Council has documented that 91% of the Mattole watershed, including much of the coastal watersheds, has been clear cut at least once since 1950. There is a direct linkage between loss of cover (and the natural vegetative cover in much of the Mattole watershed is forest), and associated land management activities such as road building, and increased sediment delivery to the streams in the watershed.

Comment 5-14: (Page 2-28) Conditions in the Mattole River Estuary. No discussion of trends. CGS has been able to document an improving trend in the estuary with respect to fluvial geomorphology after the 1964-65 flood (from interpretation of aerial photographs, years 1942, 1965, 1984, and 2000).

RESPONSE: The NCRWQCB's staff agrees, in part, with the commentor's conclusion with respect to the Mattole estuary. Trends were mentioned on page 2-28 of the TSD: "Since 1984, conditions in the estuary have shown a slight improvement after the deleterious effects produced by land use and floods before 1965." The slight improvements in the fluvial geomorphology of the estuary are insufficient to restore the beneficial uses to salmonid habitat. The interpretation of aerial photographs, for the years 1941/1942, 1965, 1984, and 2000, by NCRWQCB staff indicate that the current fluvial geomorphology of the estuary is nowhere near its condition in 1941. Residents, who have lived in the watershed since the early 1940s, have informed us that the channel was about 40 feet deep at that time, and it supported abundant populations of coho and chinook salmon.

Conditions today no longer resemble this description or what was observed on aerial photographs from that time. The following excerpt, found on page 2-15 of the TSD, details the current conditions in the estuary:

"Peak maximum temperatures in lower reaches of the mainstem Mattole river and the estuary have frequently exceeded the lethal, short term temperature extreme of 75/ F (23.8/ C) for salmonids (Table 2.6). Evidence for this was clear when a die-off of juvenile chinook was observed in 1987 in the estuary after a peak temperature of ~79/ F (26.1/ C) was measured (MSG, 1995). Habitat surveys conducted by the MRC (MRC, 1995) in lower river reaches and the estuary describe the lack of shelter, cover, and cold water refugia available for escape by salmonids during periods of high water temperature. Also, specific channel cross sections measured in the estuary by the MRC reveal a very shallow body of water, due to sediment aggradation. The shallow estuarine waters allow solar radiation to more fully penetrate the water column, possibly resulting in elevated water temperatures that are detrimental to populations of fish and other aquatic species."

Comment 5-15: Determining natural v. anthropogenic. The logic behind determining natural and anthropogenic sediment sources needs to be presented clearly. Furthermore, the sediment production numbers in Appendix I do not match those in the main text. Additional clarification is needed. How do you clearly establish linkage between road construction, timber harvest, and livestock management? How do you partition between natural and anthropogenic? The Sediment TMDL and Load Allocation numbers in Table 3.15 appear to under-estimate the natural contribution (especially when one reads Appendix I of the TSD report).

RESPONSE: The logic behind determining natural and anthropogenic sediment sources is clearly presented in TSD section 3.2, Sources of Sediment, pages 3-13 to 3-20. In section 3.2.2, Natural Sources are presented, and in section 3.2.3 Management Sources are presented. Please refer to these sections. The linkage between road construction, timber harvest, and livestock management, is that these activities are anthropogenic, not natural, activities that could generate sediment within the watershed. See pages 3-13 to 3-15 of the TSD.

Appendix I of the TSD is intended to be a geologic account over the last 45,000 years of estimated sediment production. The estimated tectonic uplift and the estimated mass wasting were used as a means to estimate sediment production. This appendix was intended to emphasize the extreme geologic and geomorphic setting of the Mattole Watershed. The TMDL and load allocations are based on estimated current (1984-2000) sediment production from natural and human causes, whereas Appendix I estimates sediment production over a time frame more than three orders of magnitude greater than that analyzed in the TSD and TMDL. Furthermore, estimated human caused sediment production was not even considered in Appendix I.

EPA and NCRWQCB agree that the amount of natural sediment is somewhat underestimated. TMDLs are required to include a margin of safety to account for uncertainties in the analysis. The underestimate of natural sources provides an implicit margin of safety for the sediment TMDL, because the total loading capacity (TMDL) is calculated as 125% of the natural sediment loading (see section 3.3.1 of the TMDL).

Commentor 6: Ellen Taylor, Resident

Comment 6-1: Observations on condition of river. I have lived in the Mattole Valley in my home located over the estuary for 28 years. During this time the river has become dramatically shallower... swimming holes were deeper... Russel Chambers, who was born in 1908 told me that the river used to be 40 feet deep in the estuary. He showed me places where there were wonderful diving rocks which are now buried in sediment.

RESPONSE: EPA agrees that there have been significant changes to the Mattole River. Changes to the river are discussed in the TMDL report (see for example, section 1.2 on Watershed Characteristics) and in more detail in the TSD.

Comment 6-2: Some impacts from logging not addressed. Upslope logging affects water quality. Shading vegetation removal warms the water table before it gets into the riparian. The air temperature is warmed as well and this in turn warms the water. Also when vegetation is removed evaporation becomes a more powerful factor and this affects water quantity. Old growth trees are especially protective of water quality: the multistory canopy and thick forest floor is like a sponge and retains the winter's water to release it during the dry months. Fog condenses on the needles and drips down into the water table... as much as 40% of annual precipitation comes from fog drip. The Mattole has lost 95% of its old growth forest... the TMDL document should recognize the importance of retaining our remaining fragment of old growth.

RESPONSE: EPA acknowledges that the effects of vegetation on water quality are complex and that the temperature model used to assess the relative importance of the various factors affecting stream temperatures does not take all of the possible effects into account. We also acknowledge that the retention of old growth forest helps maintain water quality. However, the primary conclusion of the sensitivity modeling is that shade is an important factor affecting stream temperatures. The comment does not appear to contest this conclusion, and we stand by it.

Comment 6-3: Cumulative Effects. Separating sedimentation caused by natural forces v. human activities does not appear to recognize cumulative effects...human activities exacerbate the effects of natural forces. In spite of 200 inch rainfalls and earthquakes, for thousands of years the steep and unstable Mattole watershed contained a deep and cold river with prodigious fish runs and abundant wildlife. Its unraveling was precipitated by forest removal...the lesser damage caused by helicopter logging is counterbalanced by the fact that steeper areas are now accessible...The North Forks of the Mattole simply should not be logged, to protect water quality.

RESPONSE: EPA recognizes that much sediment in the Mattole watershed is delivered to streams due to natural processes and events, such as earthquakes, and EPA agrees that human activities can increase natural sedimentation rates. The analysis supporting the sediment TMDL separated sources according to whether they are natural or human caused. This was done, in part, to address cumulative

effects and to shed light on which human activities are causing the most impact. The TMDLs set load allocations for sediment and temperature. More specific steps to protect water quality will be developed by the State when it develops implementation measures for the TMDLs (scheduled for adoption by the NCRWQCB in December 2004).

Comment 6-4: Amphibian health. The health of other species (amphibians) also depends on water quality, some of which are more exigent in their temperature demands than salmonids. The Mattole could have a thriving ecotourism business if we protect our species. Have you considered temperature requirements of eels?

RESPONSE: The Water Quality Control Plan for the North Coast Region establishes the water quality objective for temperature as the natural water temperature. The temperature TMDL and load allocation have been set to achieve this objective. EPA and the Regional Board believe that natural water temperatures will benefit all aquatic species.

Comment 6-5: Flow. Everyone who lives here uses the Mattole water and this diminishes flow...Conservation methods should be stressed...the effects of large users should be evaluated.

RESPONSE: EPA acknowledges that water quantity is a serious salmonid habitat issue, however the task of the temperature and sediment TMDLs is to evaluate the impacts of land use on stream temperatures and sediment conditions, and not to investigate all factors impacting salmonid habitat. The State Water Resource Control Board's Division of Water Rights is the entity responsible for regulation of water quantity. EPA encourages water conservation.

Comment 6-6: Prescriptions. If prescriptions for repair are firm, fair and gentle, I believe all would work cooperatively to restore [the river]. Such a process would also help the relationship of government agencies to the community. Reaching the TMDL goal must not be divisive or arbitrary or financially ruinous for any of the valley's inhabitants.

RESPONSE: The TMDLs set general levels of sediment (by source category) and temperature (by location) that need to be attained to meet water quality standards. The State will develop more specific implementation measures. EPA encourages cooperative actions to implement the TMDL and otherwise restore the river.

Commentor 7: Fay Yee, California Department of Forestry and Fire Protection

Comment 7-1: TSD page 3-15. Consider changing the phrase "preventable timber harvest activities" to preventable effects of timber harvest activities.

RESPONSE: The phrase "preventable timber harvest activities" has been changed in the TSD to "preventable effects of timber harvest activities." The sentence does not appear in the TMDL.

Comment 7-2: TSD page 3-17. Petrolia stream gage. Please consider adding the location of the Petrolia stream gage in relation to major tributaries.

RESPONSE: The location of the Petrolia stream gage has been added to Figure 1.2 of the TSD.

Comment 7-3: TSD page 3-18. Conditions in the watershed. Please consider describing the impact of legacy vs. actively used roads numerically where possible in the sediment budget.

RESPONSE: This was a level of detail that we were unable to achieve in the time allotted and the available personnel.

Comment 7-4: TSD page 3-19. Please note that the amount of grasslands in the 1950s included lands converted to grassland and the 1950's were a period of conversion. In some cases, conifer are reclaiming timberland sites.

RESPONSE: Comment noted. No change to the TMDL is necessary.

Comment 7-5: TSD page 3-21. Aerial photo analysis. What criteria where used in selecting the five planning watersheds for aerial photo analysis? Are they typical and what is the basis and confidence level for extrapolating the numbers across the entire watershed? Were all slides in a harvested area considered a management caused slide?

RESPONSE: The criteria used in selecting the five planning watersheds for aerial photo analysis were geology, slopes, landslide occurrence, and current land use that best represented the respective NCWAP subbasins. The NCRWQCB staff used their best professional judgement and considered all available information relative to these criteria. Not all mass wasting features in a harvested area were considered caused by management. The Information Center for the Environment (ICE, Department of Environmental Science and Policy, UC Davis) identified all mass wasting features >10,000 sq. ft and the apparent cause with which they were associated, and NCRWQCB staff identified all mass wasting features <10,000 sq. ft and the apparent cause with which they were associated. The associated cause for each mass wasting features was identified as (a) natural; (b) in a recognizable harvest unit, but not natural or associated with skid trails; (c) cutbank; (d) fill; (e) both cutbank and fill; (f) road related; or (g) intersects skid/tractor road.

Comment 7-6: TSD page 3-22. Please change the citation from "Fay Yee of CDF" to CDF NCWAP.

RESPONSE: The citation in the TSD has been changed from "Fay Yee of CDF" to “CDF NCWAP.” The TMDL does not contain this citation.

Comment 7-7: TSD page 3-22. Mass Wasting Quantification methods. It is difficult to parse out the underlying procedures in this section. Perhaps the procedures for mass-wasting and mass-wasting

surface erosion could be treated in separate paragraphs. I believe that this section says that mass-wasting volumes were not counted if the slides were first seen in 1941 and 1964. However, slides greater than 10,000 sq. ft. from 1941 and 1964 that had not revegetated or healed ... were counted for surface erosion.

RESPONSE: This understanding is correct. The text in the TSD has been changed to clarify this point. The TMDL does not contain this discussion; the sediment source analysis methods are described more briefly in the TMDL.

Comment 7-8: TSD page 3-25. Field measurements. The first sentence implies that measurements were taken on randomly selected samples, but the second sentence implies that this is not the case. Please clarify. Was the sampling throughout the watershed or only on the five planning watersheds.... what percentage of effort was expended in each geological types and subbasins?... what amount of legacy road and actively used roads sampled?

RESPONSE: As stated in the second sentence (of TSD section 3.2.4.1, subsection on Field Measurements), "…restricted access to desired surveyed sites along with time constraints limited field investigation efforts." Field sampling was conducted throughout the watershed, with approximately one third of the samples on each type of geologic terrain (soft, moderate, and hard). For the most part, actively used roads were sampled.

Comment 7-9: TSD page 3-26. Stream surveys. Please describe the sampling design. Was direct sediment delivery from near stream roads considered?...which category was it put in? Was there any quantitative or qualitative estimate made of skid trail construction dates?

RESPONSE: The first paragraph on page 3-26 of the TSD describes the stream sampling design. Mass wasting features caused by nearby road construction or drainage from roads, which entered the stream (within 200 feet of the active stream channel) were attributed to roads. Best professional judgement based on yield allocations was used to determine dates of all surveyed features.

Comment 7-10: TSD page 3-26. The three categories for natural mass wasting were based on roads, streams and aerial photo slides...were any other natural (or land use) slides considered?

RESPONSE: Yes, other types of slides were considered. The associations for all mass wasting features identified through aerial photos and field surveys, were identified as (a) natural; (b) in a recognizable harvest unit, but not natural or associated with skid trails; (c) cutbank; (d) fill; (e) both cutbank and fill; (f) road related; or (g) intersects skid/tractor road. See TSD section 3.2.4.1, subsection on Aerial Photo Analysis.

Comment 7-11: TSD page 3-28. The second sentence is unclear. Is this the amount of delivery that has occurred, prorated for the 1984-2002 time period? How confident is the NCRWQCB team that this is an appropriate rate to apply watershed wide?

RESPONSE: The sentence in the TSD was unclear, and it has been revised to read as follows, "…sediment delivery rate was 16 tons per year per stream crossing." (The TMDL does not contain this sentence, and it does not require revision.) The watershed study of the Sanctuary Forest by Pacific Watershed Associates, 2001, was the only detailed, professional study conducted in the watershed that quantified sediment delivery from stream crossings. NCRWQCB staff used the estimated sediment delivery amounts from this study with a high level of confidence. Applying this rate across the entire watershed likely underestimates potential delivery from this source, since the overall estimated sediment delivery rates for the Southern NCWAP subbasin (on more stable, hard geologic terrain) are less than the estimated sediment delivery rates for other NCWAP subbasins.

Comment 7-12: TSD page 3-28. Road surface erosion. Were all roads considered moderate or light traffic?

RESPONSE: Yes, all roads were considered moderate or light traffic.

Comment 7-13: TSD page 4-4. Is the vegetation dataset the Calveg 2000? Was the estimated tree height/dbh table developed from literature or field measurements?

RESPONSE: Yes, the Calveg 2000 vegetation dataset was used for the shade modeling. The TSD has been revised to clarify this point.

Comment 7-14: TSD page 4-6, figure 4.1. Please consider changing tree height to feet to match the measurement of dbh in inches.

RESPONSE: The TSD has been revised to include tree height in feet.

8. Miscellaneous Commentors from 12 November 2002 Public Meeting in Petrolia

Comment 8-1: Listing. When was the Mattole River listed on the Section 303(d) list and why are you saying it should be listed?

RESPONSE: The Mattole River was originally added to the 303(d) list by EPA in 1992 for sediment and temperature. The State of California retained the listing in updates to the list in 1994, 1996, and 1998. The State of California is currently preparing another update to the list. As part of a settlement of a lawsuit, EPA agreed to ensure that TMDLs for several North Coast rivers would be established. In accordance with the resulting schedule, EPA will be establishing TMDLs for the Mattole and North Fork Eel Rivers in December 2002.

Chapter 2 of the TMDL describes the water quality problems in the Mattole River related to sediment and temperature.

Comment 8-2: Analysis not exact. The analysis supporting the TMDLs is not very exact.

RESPONSE: The TMDLs are based on the best available information. NCRWQCB staff did considerable work to collect and analyze information related to sediment and temperature in the watershed. Uncertainties in the analysis and the conservative assumptions and adjustments made to address them are described in sections 3.3.3 and 4.3.3.

Comment 8-3: Livestock. This is the only TMDL that doesn't quantify delivery from livestock.

RESPONSE: Other North Coast TMDLs also do not identify sediment delivery from grazing as a separate source category. See also response to comment 1-2.

Comment 8-4: Earthquakes and floods. Earthquakes and floods have not been taken into account with respect to natural inputs.

RESPONSE: The sediment source analysis takes into account all sediment sources, separating natural sources from those associated with human activity. Sediment delivery that occurred during earthquakes or floods could be either natural or associated with human activity. For example, if a culvert washed out during a flood, the resulting sediment would be attributed to human activity (road-stream crossing failure). However, if an earthquake triggered a landslide with no observable connection to a road, skid trail, or timber harvest, then it would be attributed to natural mass wasting.

Comment 8-5: Natural sediment delivery. Natural sediment delivery is underestimated. The Mattole watershed naturally has high sediment delivery for reasons of climate (high rainfall), tectonics, and geology.

RESPONSE: EPA agrees that natural sediment delivery in the Mattole River watershed is very high relative to other North Coast watersheds where TMDLs have been developed. EPA also agrees that the amount of natural sediment is somewhat underestimated. TMDLs are required to include a margin of safety to account for uncertainties in the analysis. The underestimate of natural sources provides an implicit margin of safety for the sediment TMDL, because the total loading capacity (TMDL) is calculated as 125% of the natural sediment loading (see section 3.3.1 of the TMDL).

Comment 8-6: Subbasins. How were the subbasins chosen to be representative?

RESPONSE: Much of the sediment analysis was done based on subbasins. The TSD divided the watershed into the same major subbasins identified by the North Coast Watershed Assessment Program (NCWAP), since NCWAP was assessing the Mattole watershed at the same time that NCRWQCB was developing the TSD, and NCRWQCB wanted to be as consistent as possible with NCWAP.

As part of the sediment analysis, NCRWQCB staff (with assistance from the UC Davis Information Center for the Environment) estimated sediment delivery associated with landslides for each of the major subbasins by examining aerial photographs. Due to resource constraints, only selected

subwatersheds were assessed, and the results were then extrapolated to the larger subbasins. The subwatersheds were selected to cover a range of conditions (e.g., geology) to facilitate extrapolation. During the development of the TSD, NCRWQCB staff circulated a draft analysis to interested parties. At that time, only three subwatersheds had been analyzed (no subwatershed in the Eastern Subbasin was analyzed). Even though the October 2002 draft of the TSD was available, which contained the results for five subwatersheds, some participants in the 12 November public meeting were referring to the earlier draft. Thus, some of the concern about extrapolating from the subwatersheds to the major subbasins was reduced by the disclosure that two additional subwatersheds had since been analyzed.

Comment 8-7: Implications of TMDLs. Once the TMDL number is set what will that mean to the local people?

RESPONSE: The State of California is responsible for developing measures to implement the TMDLs. The TMDLs set load allocations for effective shade and sediment. There is a load allocation for effective shade for each of the stream reaches in the watershed. There are load allocations for broad source categories for sediment. How the broad load allocations will be applied to more specific local conditions will be addressed in the implementation plan developed by the NCRWQCB. Adoption of the implementation plan is scheduled for December 2004.

Comment 8-8: Fish Populations. Fish are everywhere, why are you saying fish habitat is bad?

RESPONSE: The habitat conditions in the watershed are assessed in section 2.4 of the TMDL report. Substrate composition and pool conditions both indicate that there has been excessive sediment delivery to streams in the watershed. Elevated water temperatures were found in many locations in the watershed.

In addition, the TMDL describes salmonid populations. The populations of chinook and coho salmon have declined dramatically, the population of steelhead trout less so. All three species are listed as threatened under the federal Endangered Species Act.

Comment 8-9: Rainfall. The precipitation figure is a little low.

RESPONSE: See response to comment 2-12.

Comment 8-10: Ideal temperatures for fish. What references were used for determining the ideal water temperatures for fish?

RESPONSE: References for temperature tolerances of coho salmon and steelhead trout are presented in Table 2.4 of the TSD.

Comment 8-11: Grindstone. Page 2-22 of the TSD indicates that Grindstone Creek has unfavorable fish conditions, but the data does not support this. A 2001 fish survey reported positive fish counts.

RESPONSE: Table 2.9 of the TSD lists a maximum temperature in Grindstone Creek of 78.1°F (25.6°C). This is excessively warm for both coho and steelhead, exceeding the peak lethal temperature of 75°F (23.9°C), and thus this indicates poor habitat for salmonids. This is not to say that fish are not found in portions of Grindstone Creek.

Comment 8-12: River mileages. Page 2-17 uses two different systems for river mileage. The text needs to explain this better.

RESPONSE: See response to comment 4-3.

Comment 8-13: Forest Practice Rules. I agree with the conclusion on page 4-19 that the California Forest Practice Rules are not doing enough and need to be changed.

RESPONSE: EPA agrees with the comment. The temperature TMDL is based on the water quality standard for temperature which states that the natural receiving water temperatures shall not be altered unless it can be demonstrated to the satisfaction of the NCRWQCB that such alteration in temperature does not adversely affect beneficial uses of the water. Because many portions of the Mattole River system have stream temperatures above ideal levels for salmonids, even under natural conditions, the TMDL concludes that any increase in stream temperatures would adversely affect beneficial uses. The TSD (section 4.1.3.2, subsection on Effects of Forest Practices) describes the current Forest Practice Rules and states that they allow for reduction in stream canopy, as much as 50% in some cases. Although canopy reductions and shade reductions are not the same thing, they are related and substantial reductions in canopy will usually reduce shade as well. Thus, the TSD concludes that the Forest Practice Rules do not ensure that water quality objectives set in the Basin Plan will be met.

Comment 8-14: Grazing. Grazing has not had impacts in Mattole watershed.

RESPONSE: NCRWQCB TMDL development staff observed evidence of grazing impacts in both Rattlesnake Creek and Oil Creek.

Comment 8-15: Road related mass wasting. Explain what this road related wasting looks like.

RESPONSE: Road related mass wasting includes large landslides (landslide volume > 10,000 ft^2) and smaller features, including small landslides, cut and fill bank failures, and gullies.

9. Miscellaneous Commentors from 13 November 2002 Public Meeting in Whitethorn

Comment 9-1. Public notice. Several people expressed concern about receiving copies of the public notice for the 30-day comment period at a late date or not at all. Comments were also made that small local newspapers would have been a better choice for publishing the public notice.

RESPONSE: EPA published a public notice in the Eureka Times-Standard and Humboldt Beacon announcing the public comment period. These papers were selected based on NCRWQCB staff's familiarity with the area, and because of their wide distribution in the general area of the watershed. In addition, NCRWQCB staff had compiled a mailing list of persons interested in the Mattole River TMDLs, based in part on previous mailings, expressions of interest in response to a mailing to all boxholders in the watershed, and meetings with residents. NCRWQCB mailed notices of the public meetings to about 30 persons on the mailing list and to 300 landowners. In addition, the public comment period and public meetings were announced in the Mattole Restoration Council newsletter distributed in early November. The informal public meetings held on 12 and 13 November 2001 were held for the purpose of explaining and clarifying the draft TMDLs and TSD.

Comment 9-2: Sediment numbers. How was staff able to decide the numbers for the sediment analysis? Are they averaged? And how are they averaged?

RESPONSE: The sediment source analysis is described in section 3.2 of the TMDL and section 3.2 of the TSD. The load allocations are averages for the entire watershed.

Comment 9-3: Sediment Implementation: How are the local people going to meet these numbers? Is there going to be any "banking" of these sediment delivery numbers?

RESPONSE: Methods for meeting the load allocations will be evaluated during development of implementation measures for the TMDL (see response to comment 8-7).

Comment 9-4: Temperature analysis. What will the temperature TMDL be based on? The target? The simulated potential temperature numbers are above the optimal range for salmonids.

RESPONSE: The temperature TMDL is the adjusted potential effective shade on the mean date of the MWAT for the watershed (see TMDL section 4.3.1). This is based on the finding that stream temperatures cannot be altered without adversely affecting beneficial uses (see response to comment 8-13) and modeling of shade conditions created by mature vegetation. The TMDL report also identifies target shade conditions for each stream reach in the watershed. In addition, the TMDL contains effective shade curves for common vegetation types found in the watershed. These curves can be used in the field to estimate the potential shade value for a given location, given the characteristics of the site (channel width, stream direction, and vegetation type).

EPA realizes that, in many locations in the watershed, stream temperatures in the hottest period of the year may exceed the optimal range for salmonids, even with mature riparian vegetation present to shade the stream. This is why we conclude that any increase in stream temperatures will adversely affect beneficial uses.

Comment 9-5: Temperature Implementation. What are we to expect in the future? Will there be recommendations made by staff that the local people will be required to do?

RESPONSE: See response to comment 8-7.

REFERENCES

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