ATTACHMENT 7

HARVEST WORKSHOP SUMMARY

Regional Board staff reviewed the timber harvest workshop presentations (notes and recorded information) and the information from each session is summarized below. The information is presented by session and "lessons learned" from the workshop are summarized at the end of this document.

On October 29, 2004 Regional Board staff also sent each Regional Board member a DVD copy of the timber harvest workshop. This DVD contained speaker presentations, overheads, and graphics.

SESSION 1: Beneficial Uses in Timbered Watersheds of Santa Cruz County

Katie McNeill, Environmental Specialist, Regional Board staff - *Beneficial Uses in Timber Harvest Areas.*

The presentation identified the Beneficial Uses of surface waters in the Santa Cruz Mountains and described the Basin Plan water quality objectives designed to protect those Beneficial Uses.

Invited Panelists:

Kristen Schroeder, Fisheries Resource Planner, Santa Cruz County

Summary of Kristen's presentation - Baseflow, sedimentation and barriers to migration are the critical limiting factors to steelhead in Santa Cruz County. Roads are the major contributors to sediment in the streams of Santa Cruz Co. The County is strengthening its grading and erosions control ordinance. The County also has authority over new road construction and maintenance. Existing private roads are the target of the 319(h) Roads Cost Share Grant. The Roads Cost-Share Grant is beginning its second phase this year.

The Integrated Watershed Restoration Program (IWRP) is addressing Roads and Fish Barriers in the seven County watersheds in which assessments have been done. Funding is the limiting factor for IWRP.

The presentation concluded with "Timber Harvest: County Perspective".
The County believes that:

- Minimizing erosion from timber harvest activities, especially roads, will benefit salmonids.
- Monitoring should focus on field inspections to ensure that erosion control measures are working.

- Monitor the effectiveness of erosion control practices should feed back into meaningful changes in policy & practice.

Chris Berry, City of Santa Cruz Water Department

Chris Berry stated that the Timber Harvest Plan (THP) review team process has a good history of addressing the City's concerns. Impacts from Timber Harvest are not a substantial concern when Forest Practice Rules (FPRs) are followed. On THPs:

- Erosion control is effectively assessed via visual monitoring.
- Up and downstream monitoring of crossings should work ok.
- Up and downstream turbidity monitoring, of a THP, is difficult to evaluate.

SESSION 2: Beneficial Use Stressors

Dominic Roques, Engineering Geologist, Regional Board staff – The Range of Beneficial Use Impacts and Potential Causes.

The presentation focused on the variety of influences contributing to impacts to the beneficial uses of water in the Santa Cruz mountains: urban and rural development, roads, water supply development, timber harvest, agriculture and mining.

Invited Panelists:

Gerald "Jerry" Weber, Ph.D., Geologist

Dr. Weber's presentation discussed the natural geologic variability throughout Santa Cruz County. He pointed out that the geology of the area is fragmentary and naturally produces an enormous amount of sediment each year. He questioned the ability of modern monitoring techniques to tease out differences in sediment loads due to natural vs. anthropogenic sources.

Elizabeth Herbert, Ph.D.

Dr. Herbert's talk focused on protecting sources of drinking water in the watersheds of the Santa Cruz Mountains. Major causes of source water contamination include: siltation, nutrients, bacteria, metals, and oxygen-depleting substances. The sources of this pollution are: cultivated cropland, forest activities, stormwater runoff and septic tanks (order of magnitude varies regionally). Forest practices that contribute to sedimentation include: road construction, log skidding and site preparation. Conclusion includes suggestions for changes to the forest practice rules.

David Van Lennep, Registered Professional Forester, Redwood Empire

Mr. Van Lennep's presentation stressed that current local timber harvest practices must comply with five Santa Cruz County special rules adopted in 1983. These rules require, but are not limited to, selection harvesting, no broadcast burning, 10 to 14 years between harvest, and limited winter operations. The presentation included the statement that operations monitoring through ground-based techniques (visual monitoring to discover problems and fix them) should be emphasized.

SESSION 3:

A. Measuring Beneficial Use Impacts

Dominic Roques, Engineering Geologist, Regional Board staff – Monitoring Strategies: Site-Specific, Watershed-wide, Cumulative Effects

The presentation focused on monitoring approaches and existing monitoring efforts in the Santa Cruz Mountains.

Invited Panelists:

Leslie Reid, Ph.D., Research Geologist, U.S. Forest Service

Dr. Reid's presentation highlighted the problems with monitoring plan design. Many monitoring efforts do not appropriately consider the natural variability of a system, fail due to faulty design (usually measuring wrong variable), or fail due to procedural problems. Dr. Reid emphasized that monitoring depends on the question needing to be answered. Steps that can lead to the development of a successful monitoring plan design:

a. Questions must be carefully defined.
b. Monitoring strategy is designed to answer the questions.
c. Design is based on an understanding of the system.
d. Statistical expertise used in design.
e. Selected strategy can detect a meaningful change.
f. Analysis Plan is developed before monitoring begins.
g. The Plan receives adequate statistical and technical review.

Randy Klein, Hydrologist, Redwood National and State Parks

Mr. Klein's presentation focused on turbidity. He stated that the following factors should be considered when collecting and using turbidity data:

- Important to look at both levels and duration of exposure to evaluate impacts, not just levels.
- Turbidity as surrogate for suspended sediment can work once a good correlation is established.
- Yes or No answers to whether a storm is causing an impact to water quality is difficult to make.
- We need to use automated samplers to monitor storms.
- Monitoring turbidity upstream vs. downstream can show whether projects have effects.
- Data analysis takes about twice as long as fieldwork.

Mary Ann Madej, Ph.D., Research Geologist, U.S. Geologic Survey

Dr. Madej's presentation focused on monitoring of instream water quality parameters with consideration for spatial and temporal trends. Monitoring issues that need to be addressed include duration, frequency, type, timing, and cost of data collection. Key elements discussed included:

- Scale of monitoring needs to be decided: Regional, Watershed, timber harvest plan, etc.
- Monitoring Duration: Seasonal (short), yearly, etc.
- Instream variability due to:
  - Type of disturbance.
  - Location of disturbance.
  - Response time.
  - Time for change and recovery

B. Current Monitoring Efforts at Regional and State Level

Invited Panelists:

Pete Cafferata, Senior Hydrologist, California Department of Forestry and Fire Protection

Pete Cafferata's presentation covered five areas:

- Forest Practice Rules & THP Implementation Monitoring
- Summary of Hillslope Monitoring effort
- Summary of CDF supported in stream monitoring efforts
- Summary of other CDF supported monitoring efforts
- Conclusions of Forestry – monitoring related

- Monitoring Study Conclusions:
  - Post harvest canopy is high and exceeds FPRs
  - Watercourse crossings are frequent problems. The cause is mostly maintenance related.
  - Roads requirements need better implementation in terms of drainage design, construction and maintenance.
  - Changes in peak flow related to timber harvest are minor in large basins.
  - Implementation of modern FPRs (post 1973) has substantially reduced water quality impacts related to sediment.
  - Individual practices required by the FPRs are generally effective in preventing hillslope erosion features when properly implemented.

Pete Cafferata's "Take Home Message" was that 1) road drainage and crossing design, construction and maintenance are concerns, 2) THP level sediment monitoring should focus on locating problem areas in a timely manner and correcting them if possible, and 3) CDF/SWRCB/Regional Boards are moving towards development of a workable THP scale monitoring approach in the near future via the MOU process.

Jim Pedri, Assistant Executive Officer, Central Valley Regional Water Quality Control Board

Region 5 is working within the CDF process for management of THPs. Region 5 has enough staff to look at 20% of their THPs and Regional Board staff are able to conduct limited forensic monitoring.

THP self-monitoring is required when requested by the Regional Board. They rely on the discharger to document management practices, inspect property after storms, and when problems occur, the discharger will be asked to do limited forensic monitoring. Region 5 also will require watershed wide monitoring when evidence of impacts exists.

Violations can result in termination of the waiver (i.e., good incentive to comply) and the Regional Board increases monitoring when risk is high or management practices fail.

Region 5 uses the "Stair Step" Chart – shows different levels of monitoring (4 tiers). [Staff note: this chart has been adopted by the statewide monitoring MOU work group]

Dave Hope, Senior Environmental Specialist, North Coast Regional Water Quality Control Board

Mr. Hope's presentation focused on monitoring basics (Who, what, where, spatial, temporal etc.). He discussed types of monitoring (Implementation, Forensic, Trend, Assessment, Compliance) and stressed the need for quality assurance/quality control. He stated that monitoring should be broad and include establishment of background. Made it clear that one should not look just at timber harvesting for sources of sediment.

SESSION 4:

Region 3 Staff Proposal For Timber Harvest Monitoring

Chris Adair, Senior Water Resource Control Engineer

Forensic Monitoring Approach

Mr. Adair's presentation focused a forensic monitoring approach for Timber Harvest operations in Region 3. He explained that the primary goals of this monitoring approach are two-fold; first to verify that the conditions of waivers are being met and second, to insure that the monitored activities do not impair the potential downstream uses. He emphasized that the most important role in monitoring timber harvest activities is played by the inspector. He suggested monitoring be based on a weight-of-evidence approach using best professional judgment.

- Monitoring Roles (overhead) – each agency's role:

Invited Panelists:

Richard Harris, Ph.D., Extension Forest Specialist, U.C. Berkley

Dr. Harris' presentation focused on several different case studies of forensic monitoring.
His conclusions included:

- Rural Road Development and uncontrolled grading have affected fish in Santa Cruz County. Multiple, and sometimes competing, beneficial uses need to be protected.
- Forensic monitoring example: Gully monitoring. Look for volume/depth changes.
- Forensic monitoring is viable
- Both qualitative and qualitative analysis is appropriate.

Robert Curry, Ph.D., Research Director, Watershed Institute, C.S.U. Monterey Bay

Dr. Curry's presentation focused on two basic types of monitoring:

1. Real Time – During the Storm:

- Need to monitor the rising limb of the hydrograph during storm events. Initial runoff above runoff threshold. Must be there during the storm. Need both discharge and concentration measurements. Above/below or before/after changes.
- The best, but expensive.
- Can be automated where justified
- Lab and field support are important (use professionals)
- Existing domestic water intake monitoring is usually too low in the watershed to be effective at determining effects from timber harvest.
- Automated sampling cost about $12,000 to $15,000 per monitored point
- Manual (simplest) - Use a DH-48, portable weir or current meter. Cost about $2000.

2. Forensic – Before and After the Storm
   - Look for evidence of erosion, sediment transport and sediment disposition.
   - Collect source and deposit samples.
   - Uses "Best Professional Judgment"
   - Timing and monitoring locations are important
   - Need calibration sites (undisturbed)
   - Residual Pool Volume (V*), pins, chains, ground surveys, temperature, and micro or macro benthic organisms.
   - Region 3 has the potential for sediment source forensic mineralogy because of the diverse geology

- Use students (cheap and good local supply)
- Use geologic maps, aerial photos, road maps, Llidar, erosion potential analysis, etc.
- Roads: Trigger for monitoring could be greater than 4 mi of road per square mile.
- Prioritize THPs
- Larger scale monitoring has more variability.
- Watersheds are unique.

John Ricker, CPESC, Environmental Programs Manager, Santa Cruz County

- Multiple and diffuse sources of impacts, not just timber. Within timber practices there is variability in impacts and effectiveness of BMP implementation. Monitoring strategies depend on question you need to answer. Proper design and implementation are keys to success. Often need investments of time and money to be meaningful. Existing monitoring and assessment activities proposed are underway by County RCD (largely funded by Regional and State Water Boards) Coastal Conservancy, and Regional Board via TMDLs. The Santa Cruz Mountains have the greatest overlay of watershed assessments and monitoring in the Region.
- Other Regions and State efforts re: monitoring of THPs is variable and still in development. Forest practice rules implementation has yielded reduction in Timber impacts. There is agreement that implementation monitoring is needed by THPs, but lack of agreement on in-stream monitoring by THPs.
- County staff is clear that Forensic monitoring is best bang for the buck. Forensic monitoring needs to be designed with best professional judgment, considering unique criteria or THP log density of roads and watershed uniqueness. Knowledge of

watersheds is constantly evolving. Staff also recognizes the need to determine and apply triggers for increased monitoring levels and when in-stream monitoring at the THP level is meaningful. RB3 is planning watershed monitoring in the Santa Cruz area via the San Lorenzo River Sediment TMDL implementation.

- Staff does not currently propose watershed monitoring for THPs.

SESSION 5:

Summary of Key Information Discussed/Outstanding Questions and Issues

- Summary: Regional Board Staff
- Question and Answer – Board Members, Staff, and Panelists
- Public Forum
- Regional Board Discussion/Direction

Key Points:

Monitoring

1. The natural variability of a system needs to be considered when developing a monitoring program.
2. Monitoring strategies depend on question you need to answer.
3. To design an appropriate monitoring program, you need to develop appropriate questions to be answered. In other words need to define the question and relate to beneficial uses.
4. In-stream monitoring requires a long-term commitment:
    - Pros: cost; repeatable; link to fish; shows long-term trends;
    - Cons: once change detected, the damage is done.
5. There is agreement that implementation monitoring is needed on THPs, but lack of agreement on in-stream monitoring on THPs.
6. Level of monitoring should focus on implementation and corrective action.
7. Monitoring upstream-downstream THP vs. monitoring upstream downstream of management practice. If we need to know how a THP is protecting water quality, choose certain management practices to monitor, not the whole THP.
8. Start with Forensic monitoring. If problems arise, increase monitoring to include water column sampling.
9. Forensic monitoring may identify problems but after it happens or the cause is obliterated, likely to find false negatives or positives.

Management Practices

10. Within timber practices there is variability in impacts and effectiveness of management practice implementation.
11. To prevent or limit impacts to water quality, management practices should be implemented to fully prevent contribution if possible.

12. Water crossings and roads need better implementation requirements.
13. Management practices should be monitored for their effectiveness. If a practice cannot be effectively monitored, then it shouldn't be allowed.
14. County focusing on impacted watersheds more systematically.

Sources of Impacts

15. Multiple and diffuse sources of impacts, not just timber.
16. Rural road development and uncontrolled grading have affected fish in Santa Cruz County.
17. Multiple, and sometimes competing, beneficial uses need to be protected (e.g., more water for humans (MUN) = less water for fish (COLD))
18. Fish barriers are less of problem than sedimentation for fish.

Outstanding Questions and Issues

19. The Santa Cruz Mountains have the greatest overlay of watershed assessments and monitoring in the Central Coast Region.
20. Focus on regulation of individual THPs; can't make individuals responsible for watershed monitoring.
21. 3-acre conversions could be a significant cumulative effect.
22. Questions that remain:
    - What is quality of fish habitat and population in streams?
    - Are high sediment levels causing significant impacts similar to other areas?
    - What type of monitoring must be done to insure the COLD (fish) beneficial use is protected?
    - How do we get a well-funded set of watershed assessments?
23. The Board may need a special presentation on existing rules. Monitoring MOU should be agreed to soon. CDF cannot approve a THP that violates a Basin Plan.

Finally: All the panelists were asked to think about the workshop and prepare a follow up letter that includes their ideas for making progress with the timber monitoring issues discussed during this Workshop. The letters received by staff are attached.