

## State WQMP Adaptive Management System – DRAFT

4/22/2010

### I. Purpose and Partner Commitment to Collaboration

#### 1. Purpose & Scope

Adaptive management is a “systematic approach to improving the management process and accommodating change by learning from the outcomes of a set of environmental management policies and practices” (Gregory et al., 2006). An adaptive approach is necessary for water quality management, given that the conceptual models underlying most resource management decisions rely on an imperfect understanding of the cause-and-effect relationships between land use activities and water quality response. This imperfect knowledge can increase the risk of a management activity on the resource of concern, and can potentially result in unintended consequences to these resources. Adaptive management is considered an effective process for dealing with this type of uncertainty and risk (Ralph and Poole, 2002).

The purpose of this adaptive management system (AMS) is to provide the information needed for the USFS, the State and Regional Water Boards, and stakeholders to ensure that the implementation of activities in the National Forestlands of California occur in a manner that maintains, protects, and restores water quality and the beneficial uses of water, and complies with federal water quality statutes and regulations (i.e., the Clean Water Act), in addition to California water quality requirements (i.e., Porter-Cologne Water Quality Control Act). The primary mechanism for achieving this goal is through the implementation of Best Management Practices (BMPs). The Water Quality Management Plan (WQMP) defines the overall goal and general objectives for water quality management on National Forestlands, describes BMPs, and outlines the processes for implementing BMPs. Explicit in the WQMP is the acknowledgement that there is still uncertainty regarding how well BMPs are implemented, and how effective BMPs are in achieving objectives across time and space. As such, the WQMP recognizes that an adaptive approach is necessary to optimize the implementation and effectiveness of BMPs on National Forestlands.

By designing and implementing an adaptive management system developed cooperatively between the USFS and State Water Board, the process can achieve the following desirable outcomes.

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- Certainty of change as needed to achieve the goals and objectives of the WQMP;
- NPS pollution is addressed in a manner that maintains, protects, and restores water quality and the beneficial uses of water on National Forest Lands
- Sufficient feedback mechanisms are in place so that the State Water Board, USFS, and the public can determine whether the program is achieving its stated objectives
- Predictability in the process of change so that regulators, stakeholders, and members of the public can prepare for this change.
- Application of quality controls to scientific study design, project execution, and interpretation of results;
- A hierarchical (i.e., nested) approach to monitoring that can elucidate “patterns and process across spatial scales and link to the scale at which outcomes of management decisions are expressed” (Ralph and Poole, 2002).
- A systematic approach to improving the management process through coordinated learning at all organizational scales (i.e., from the bottom-up to the top-down).
- Increased clarity, transparency, and accountability in management and decision making processes.

The USFS and Water Board have committed to collaborate through the State MAA, and will work cooperatively in the implementation of this AMS.

## 2. Procedures & Requirement

Adaptive management utilizes a multi-stage process for improving management actions. Most adaptive management processes are more explicit variations of the Plan-Do-Check-Act model (PDCA) common in most Environmental Management Systems (EMS) (Box 2). I agree with the observation that Michael Hogan made at the Adaptive Management Working Group meeting on April 22, that the Plan-Do-Check-Act model leaves out a very important part of the adaptive management process – identifying the knowns and unknowns. Including this step will provide the opportunity to investigate the operation of the current MAA process to try and understand what worked, what didn't work and why. I recommend that we replace the Plan-Do-Check-Act model with the adaptive management model that the group selected in our first adaptive management meeting.

**Comment [TU1]:** It is not clear what is meant by this statement.

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**Comment [TU2]:** Recommend including in employee's Performance Evaluations

**Comment [TU3]:** At some point in development of the AMS the specific Job Position should be identified

**Comment [TU4]:** Position?

**Comment [TU5]:** Position

**Deleted: 2. Responsibilities¶**  
**Agency Executives:** Approve and sign State WQMP, which will include this AMS. Provide internal resources to support agencies' roles and responsibilities under the WQMP and management system. Direct actions and decisions based on recommendations provided in monitoring reports produced by staff and/or by the Joint USFS/Waterboard Science/Policy Team. ¶

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 USFS Regional Office Staff: Coordinate ongoing communication between USFS and Waterboard staff at Regional level. Coordinate synthesis of monitoring information collected and reported at the Forest level, to develop regional reporting of monitoring and research results. Coordinate annual reporting of region wide results, along with an annual training and workshop on monitoring techniques and results. Coordinate periodic (4 year intervals) comprehensive review of monitoring research results to inform and recommend modifications to either technical guidance documents (ie. BMP manuals), or the AMS monitoring and research program. ¶

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 USFS Forest Staff: Implement Forest level monitoring as described in S(... [1]

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**Box 2. A description of the Plan-Do-Check-Act model commonly used for designing environmental management systems (taken from Sokulsky and Beierle, 2007).**

**Plan** - Identify the goal(s) to be achieved, define how potential management actions relate to the goal; develop and document explicit objectives and action plans, define areas of uncertainty to investigate, and allocate funding;

**Do** - Implement and document actions, perform research and monitoring to test hypotheses and reduce uncertainty;

**Check** - Track, monitor, and evaluate the results of the actions implemented; and synthesize information to be useful for policy makers;

**Act** - Adopt and adjust future goals and actions in light of reduced uncertainty and feedback on performance of planned actions.



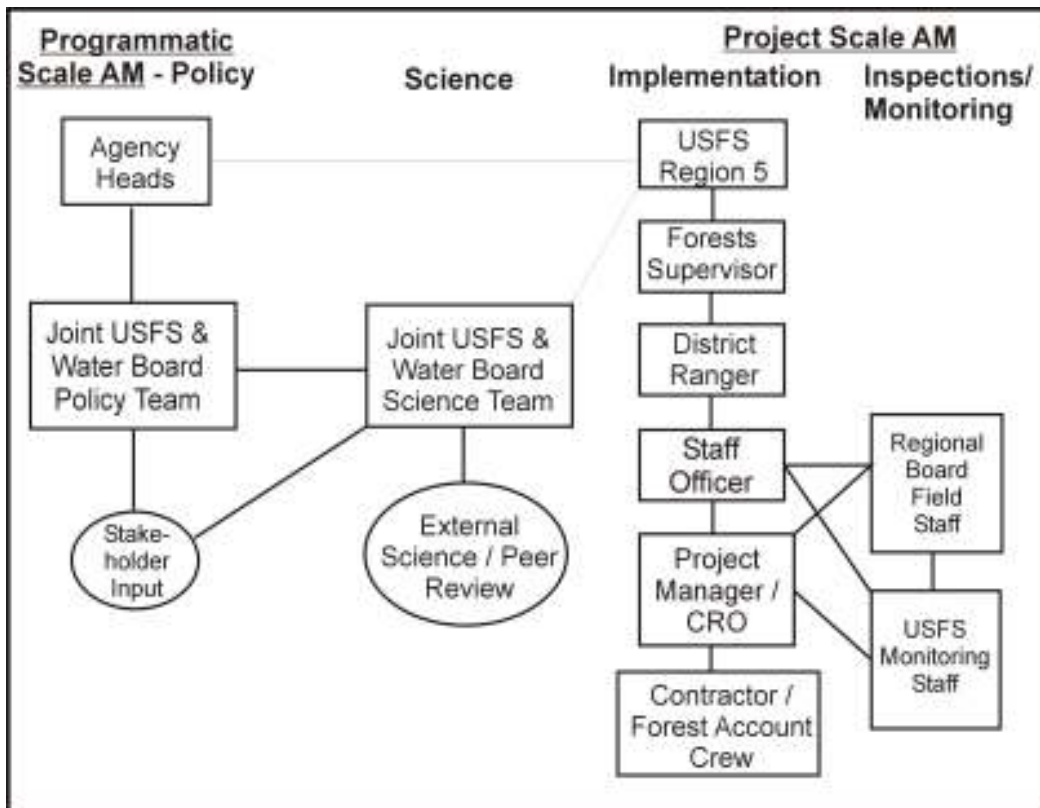
## II. Roles and Responsibilities

Roles and responsibilities are described below. The implementation of this AMS will be a cooperative effort between the USFS and Water Boards. The USFS will conduct most of the monitoring program and reporting, and will collaborate with SWRCB staff in interpretation of results, and recommendations for adapting either management actions or the monitoring approach. Figure II.A shows the organizational relationship between the primary groups and individuals.

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Stakeholders will provide review and perspective/input to design of AMS, monitoring strategies, monitoring reports, and management recommendations.

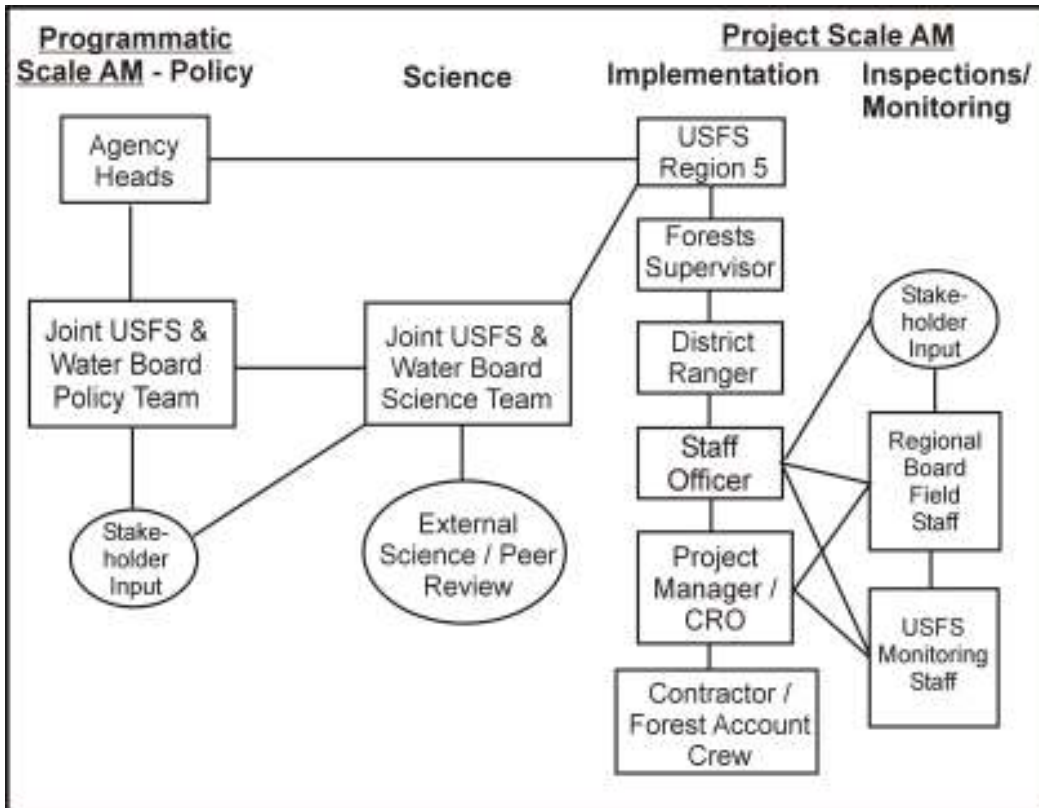


Figure IIA. Organizational Relationship between USFS and Waterboard Staff

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**Agency Executives:** Approve and sign State WQMP, which will include this AMS. Provide internal resources to support agencies' roles and responsibilities under the WQMP and management system. Direct actions and decisions based on recommendations provided in monitoring reports produced by staff and/or by the Joint USFS/Waterboard Science/Policy Team.

Comment [TU7]: Recommend identifying a specific position e.g., Deputy Regional Forester

**USFS Regional Office Staff:** Coordinate ongoing communication between USFS and Water Board staff at Regional level. Coordinate synthesis of monitoring information collected and reported at the Forest level, to develop regional reporting of monitoring and research results. Coordinate annual reporting of region wide results, along with an annual training and workshop on monitoring techniques and results. Coordinate periodic (3 year intervals) comprehensive review of monitoring research results to inform and recommend modifications to either technical guidance documents (ie. BMP manuals), or the AMS monitoring and research program.

Comment [TU8]: Recommend displaying the specific responsibilities of the responsible Staff in a bullet format.

Comment [TU9]: Recommend identifying a specific Job Position

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**USFS Forest Staff:** Implement Forest level monitoring as described in Section V. Use monitoring data collected during project to immediately inform and adapt project implementation to correct deficiencies and prevent harm to soil and water resources and

Comment [TU10]: Specific Position

beneficial uses. Report monitoring data to RWQCB and Region 5 as described in Section VI. Use annual reporting to share lessons learned, and recommend to line officers modifications to design features/BMPs, and administrative processes at the Forest level to improve planning, contracting, and implementation of Forest management activities.

Water board Staff: Provide immediate feedback to USFS Forest Staff regarding Water Board's independent monitoring inspections. Periodically attend BMPEP inspections and/or training to increase calibration among agencies. Review annual reports and provide feedback to USFS regarding report adequacy and implications. Meet annually to potentially revise structural and analytical elements of the adaptive management system. Make clear, in advance, the potential consequences for failure to achieve an NPS control implementation program's stated objectives.

**Comment [TU11]:** Specific Position

Stakeholders : This process will be open to the stakeholder community who will review and comment on all aspects of the AMS program, including the monitoring strategies, monitoring reports, and management recommendations. Stakeholders may provide endorsement of State WQMP and AMS if they support the approach.

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### III. PLAN - Goals and Objectives of State WQMP

The overall goal of the WQMP is to maintain, protect, and restore water quality and the beneficial uses of water on National Forest Lands. Under this broad goal the WQMP lists the following general objectives:

1. To ensure that, on NFS lands in California, the quality and beneficial uses of water are maintained where they are in good condition, consistent with federal and State anti-degradation/non-degradation policies, and the principles of conservation biology.
2. To ensure that, on NFS lands in California, the quality and beneficial uses of water are protected from further degradation and restored to a good condition where they are declining toward being listed as water quality limited pursuant to Clean Water Act Section 303 (d).
3. To make substantial progress toward eventual delisting of water body segments that have been listed pursuant to Clean Water Act Section 303(d) and that are located on, or receiving contributing pollutant discharges from, NFS lands.
4. To remediate legacy sources of pollution on NFS lands in California within 10 years of initiation of revised WQMP.
5. To ensure compliance with water quality goals and legal requirements in the most efficient manner.
6. To provide sufficient feedback mechanisms so that the State Water Board, USFS, and the public can determine whether the program is achieving its stated goal
7. To consolidate direction applicable to BMP use for NPS pollution control on NFS lands in California for the maintenance, protection, and recovery of beneficial uses of water.
8. To establish a uniform process of BMP implementation that will meet the intent of: 1) the Federal and State water quality laws, executive orders, and the United States Department of Agriculture (USDA) directives, and 2) Water Board water quality standards, plans and policies that are applicable to activities on NFS lands in California.

**Comment [TU12]:** This should be defined.

**Comment [TU13]:** Provide examples

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9. To incorporate water quality maintenance, protection, and improvement considerations into the site-specific planning process.
10. To employ a nested monitoring strategy involving different type of monitoring at different geographic scales
11. To ensure that this WQMP and the implementation thereof are effective in achieving these objectives, and desired conditions for soil, water, and aquatic resources as described in individual Forest Plans, on NFS lands in California, and where they are not, that the practices and/or implementation processes are refined and adapted as appropriate
12. To ensure that the Forest Service achieves these objectives to avoid serious consequences imposed by the State Water Board for failure to comply with water quality statues and regulations.
13. To enhance Forest Service performance as a water quality management agency, and increase and improve its responsibility, transparency and accountability in its relationships with the RWQCB and State Water Board.

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## IV. PLAN – Conceptual Model and Key Monitoring Questions

The conceptual model in Figure IV.A describes the information needed to determine whether we are achieving the goals and objectives described in Section III.

From this conceptual model, the following describes the key questions for evaluation by the monitoring program, that will provide the information needed to determine whether we are meeting the general objectives described in Section III.

### BMP Implementation and effectiveness (Objectives 6,7,8):

1) Is the Regional BMP Handbook being effectively and consistently utilized to assure BMPs are being designed appropriately in USFS planning and contracting processes at the Forest scale? What improvement can be made to increase utility of guidance provided in BMP handbook?

2) Are BMPs to protect soil, water, and aquatic resources described in NEPA/CEQA analysis and decision being implemented as designed, and what are causes of implementation deficiencies.

#### **Methods**

Project Scale: BMP Implementation checklists  
Forest and Region Programmatic Scale: BMPEP

(target: 95% success across forest or region)

3) Are BMPs to protect soil, water, and aquatic resources implemented as part of USFS management practices effective at preventing adverse impacts to these resources, and what are the causes of effectiveness deficiencies?

#### **Methods**

Project Scale: Daily diaries kept by project managers during storm events. Temporary BMP Monitoring-(LTBMU only).  
Forest/Region Programmatic Scale: BMPEP

Quantitative BMP effectiveness studies and research would also be utilized as it becomes available.

(target: 95% success across forest or region).

**Comment [TU14]:** As recommended by Michael Hogan, there should be an analysis of the success of the current MAA. Where has it been successful? Where has there been problems achieving goals? Why are BMPs not being implemented. Why has there been inadequate enforcement of standards? Is the BMPEP providing accurate information? What are potential weaknesses of BMPEP? An analysis of the current process could provide insight into development of the implementation program. For example, there may be institutional circumstances that have contributed to relatively low BMP implementation on certain BMPs that a checklist will not remedy.

**Comment [TU15]:** After an initial analysis of the current system, additional methods may be identified.

**Comment [TU16]:** It seems like we should strive for 100% implementation. Meeting the implementation requirement should be easier to control than the BMPs effectiveness.



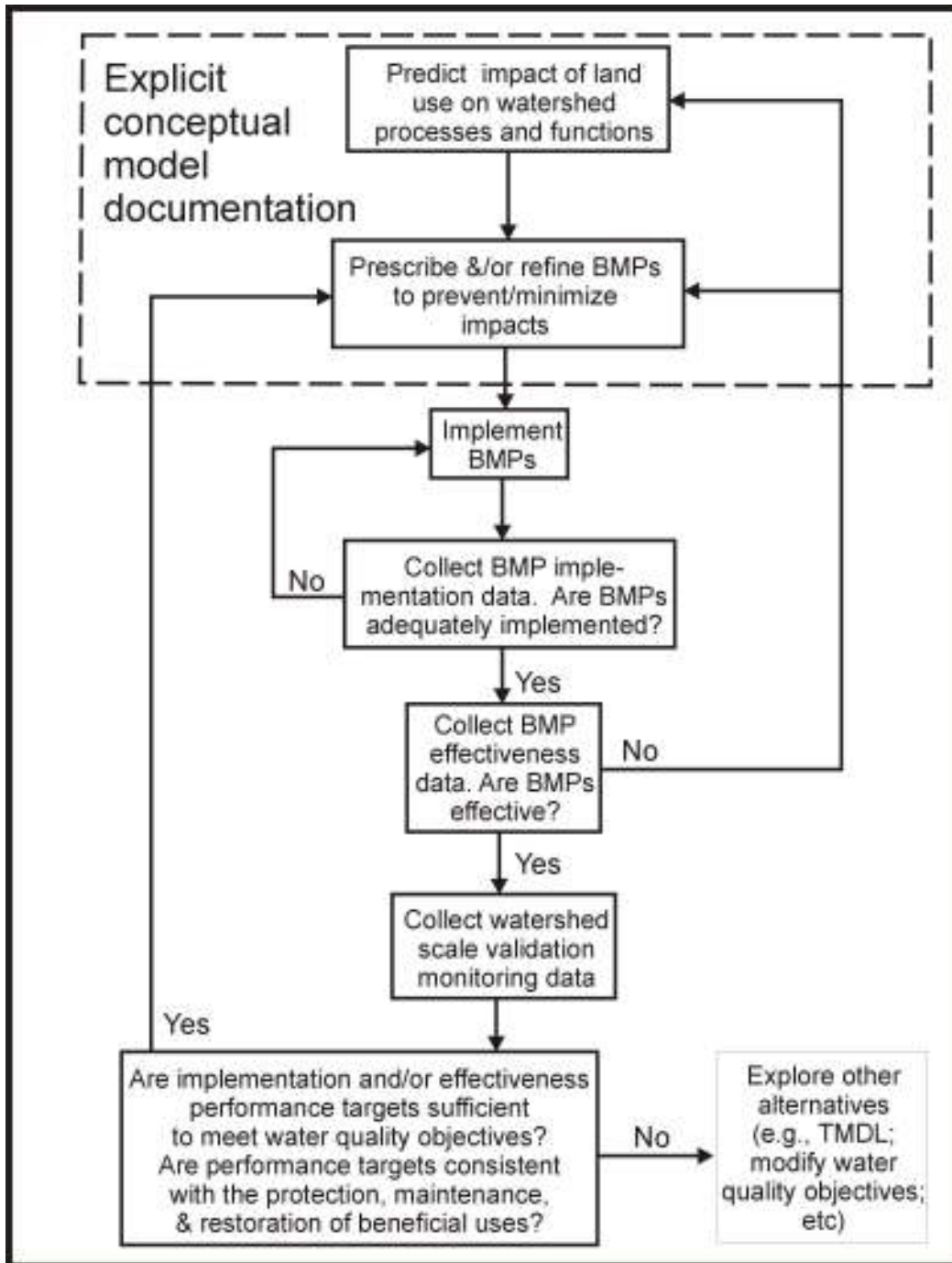


Figure IIIA. State WQMP Conceptual Model

Effectiveness and Validation Monitoring at the Watershed Scale (Objectives 1,2,3)

4) Are BMPs effective in meeting water quality objectives at the watershed scale? Are implementation and/or effectiveness performance targets sufficient to meet water quality objectives? Are performance targets consistent with the protection, maintenance, and restoration of beneficial uses? These activities include the application of best management practices (BMPs) as described in the Regional BMP Handbook, as well as the restoration of legacy sites.

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**Methods**

Forest/Region programmatic: Focused watershed monitoring utilizing USFS Stream Channel Condition Inventories.

Comment [TU17]: There may be other methods that could be included and tested through the AMS

(Targets: ?% of streams within reference conditions (SCI), ?# of streams delisted every 5 years, no increase in listed streams as a result of mgt activities)

A description of the methods utilized to evaluate attainment of specific monitoring objectives and targets is presented in Section VI below.

**V. DO – Implement the BMPs and Water Quality Management Program**

This work will involve implementing the BMPs and other prescribed water quality protection practices during all project planning and implementation activities, including the restoration of legacy sites. Methods used will be the current practices and procedures as prescribed in prevailing BMPs, Forest Plan Standards and Guidelines, and other relevant documents.

**VI. Check – Implementation, Effectiveness, and Validation Monitoring Strategy**

A comprehensive and regionally consistent water-quality monitoring program is needed to guide water-quality protection programs on national forests in the Pacific Southwest Region. The program described below is intended to meet the needs of the Region as well as the State Water Resources Control Board and the Regional Water Quality Control Boards for water-quality information. The program described below includes procedures for evaluating if the practices for protecting water quality were implemented as prescribed (implementation (or compliance) monitoring). The program also assesses whether current practices are effective and whether the performance targets are adequate for accomplishing the intended water quality goal.

Comment [TU18]: Incomplete sentence?

Criteria

The program is designed to include the following:

1. A scientifically valid approach to data collection and analysis.
2. Early detection of water-quality problems associated with current management activities.

3. Follow-up monitoring to ensure correction of known deficiencies and to evaluate long-term effectiveness of water-quality protection measures.
4. Clear consequences for failure to correct deficiencies resulting in degradation of water quality.
5. Conjunctive hillslope and in-channel monitoring (“nested” monitoring) to evaluate linkages between BMP effectiveness and effects on beneficial uses.
6. Evaluation of trends in beneficial uses in receiving waters downstream of forest management activities, including waters listed as impaired under section 303(d).
7. Assessments of water quality in relatively pristine reference streams for comparison with listed and potentially listed impaired waters.
8. Targeted monitoring of high-risk projects.
9. Flexibility in program scope to ensure that the program can be accomplished with available Forest Service resources.

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Comment [TU19]: Implementation of a project should be contingent on adequate funding to support long-term monitoring and necessary maintenance.

### Program Management

1. The monitoring program is a regional program coordinated by the Regional Office and conducted by the national forest staffs.
2. Monitoring targets are made in consultation with the RWQCB and based on regional priorities, rather than being evenly distributed among forests, and meet a statistically significant sample size.
3. Annual targets for all monitoring activities are set by the Regional Office and communicated to the State and Regional Boards. Targets are changed as necessary to reflect changes in funding and staffing but will always meet the minimum sample size necessary to achieve statistical significance.
4. Funding to support monitoring is allocated based on assigned targets
5. Funding for Projects will include adequate resources to cover long-term monitoring
6. National Forest watershed staff is used to conduct monitoring to the extent possible, but monitoring may also be conducted by other trained USFS personnel.
7. Each national forest will submit an annual monitoring report to the State Water Board and the appropriate Regional Boards. The USFS Regional Office will submit an annual summary of monitoring results for all forests in the Pacific Southwest Region, and will compile a more detailed analysis of monitoring results every 3 years.

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### Monitoring Plan

This plan relies on existing well-documented monitoring methods. Hillslope monitoring for management activities use Best Management Practice Evaluation Program (BMPEP, U.S. Forest Service, Pacific Southwest Region, 2002) protocols. In-channel monitoring follows Stream Condition Inventory (SCI, U.S. Forest Service, Pacific Southwest Region, 2005) protocols.

1. Hillslope monitoring of current management activities and corrective actions
  - a. All projects will have administrative implementation monitoring using a “checklist” approach. This monitoring will be conducted by USFS project staff (timber, range, recreation, etc.) and will be coordinated and reviewed by the Forest Hydrologists. Administrative implementation monitoring is the primary systematic means for early

detection of potential water-quality problems, and will be completed early enough to allow corrective actions to be taken, if needed, prior to the onset of the first winter after project implementation.

- b. The BMPEP, with random site selection, will continue to be the primary means of assessing the effectiveness of water-quality protection for current projects on NFS lands at the hillslope scale.
- c. Effectiveness monitoring for BMPEP protocols that have consistently scored 95% or higher for 5 consecutive years at the Regional level will be reduced to allow efforts to focus on implementation, retrospective, and beneficial-use monitoring.
- d. Corrective actions will be taken in response to recommendations made the previous year to address water-quality protection, and these actions will be documented in annual BMPEP reports and made available to the RWQCB and the public,
- e. Follow-up monitoring for sites that were not rated as fully implemented or effective the previous year will be conducted, and results will be presented in annual BMPEP reports and made available RWQCB and to the public,
- f. Selected “high risk” projects in watersheds that are at or above thresholds of concern for cumulative watershed effects, as determined by the Equivalent Roaded Area model, or in watersheds with 303(d) listed impaired waters, will have non-random BMPEP effectiveness monitoring and these actions will be documented in annual BMPEP reports and made available to the RWQCB and the public,
- g. National forests will conduct and document the results of road patrols to the extent allowed by weather, safety, and road conditions during and after major storms (patrol minimum ?? mileage during wet season) to detect and correct road drainage problems that could affect water quality.

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## 2. Retrospective hillslope monitoring of past management activities

- a. Sample pools will be developed for timber, engineering, and grazing projects completed in the past 5 years that were rated as effective as part of the random BMPEP monitoring.
- b. Projects will be selected randomly for retrospective BMPEP effectiveness evaluations.
- c. Results of retrospective monitoring will be compared to original BMPEP effectiveness scores to determine if BMPs remained effective over a period of years and these actions will be documented in annual BMPEP reports and made available to the RWQCB and the public,

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## 3. Representative in-channel beneficial-use monitoring

The purpose of in-channel monitoring of beneficial uses is to determine whether BMPs collectively are effective in protecting water quality at the watershed scale. Effectiveness will be assessed by monitoring trends in channel characteristics that affect beneficial uses and by comparing channel characteristics of streams downstream of intensively managed areas with those in relatively pristine reference watersheds (the paired watershed approach). The State Board SWAMP program criteria will be used to determine which streams will be considered reference streams.

Because USFS resources are limited, monitoring will be restricted to a relatively small number of sites. Therefore, monitoring sites will need to be carefully selected to represent

large landscapes within the national forest system. Detecting downstream channel changes related to upstream activities is problematic (MacDonald and Coe, 2006), so monitoring sites will be located on headwaters streams. Paired monitoring sites (intensively managed and reference) will be selected to have similar valley segment and stream reach characteristics (Bisson and others, 2006).

- a. Fixed long-term locations for SCI surveys will be selected by the forest hydrologists and Regional Office in cooperation with the State and Regional Board staffs to represent areas of similar landform, geology, climate, and vegetation. SCI sites will be selected to minimize variability in channel type.
- b. SCI survey locations will be paired, with one reference watershed and one intensively managed watershed in each pair.
- c. SCI surveys will be made at least once every 5 years and as soon as possible following major (RI>10 year) floods. Roughly 20% of the watersheds will be surveyed each year, on average.
- d. Adverse impacts in intensively managed watersheds will be inferred by comparison of SCI results with SCI results for reference watersheds.
- e. Non-random “nested” BMPEP evaluations for all current management activities will be conducted within the selected intensively-managed watersheds. Implementation and effectiveness results will be compared to SCI results.
- f. For watersheds 303(d) listed for water temperature, SCI water-temperature monitoring will be conducted for at least one full snow-free season. In addition, effective shade will be monitored using Solar Pathfinders.
- g. Sites will be removed from or added to the sample pool as needed by the Regional Office in consultation with the State and Regional Boards.

References Cited:

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Bisson, P.A., Buffington, J.M., and Montgomery, D.R., 2006, Valley segments, stream reaches, and channel units: Chapter 2 in Methods in Stream Ecology, Elsevier Publishing, p. 23-49.

Frazier J.W., Roby, K.B., Boberg, J.A., Kenfield, K., Reiner, J.B., Azuma, D.L., Furnish, J.L., Staab, B.P., and Grant, S.L., 2005, Stream Condition Inventory Technical Guide Version 5.0: USDA Forest Service, Pacific Southwest Region - Ecosystem Conservation Staff, Vallejo, California, 111 pp.

MacDonald, L.H., and Coe, D., 2006, Influence of headwater streams on downstream reaches in forested areas: *Forest Science* 53(2):148-168.

USDA Forest Service, 2002, Investigating water quality in the Pacific Southwest Region, Best Management Practices Evaluation Program: A User’s Guide: USDA Forest Service, Pacific Southwest Region, Vallejo, California.

**ACT - Short Term Corrective Actions, Reporting, and Recommendations/Decisions for Programmatic Change**

Adaptive management as used in this plan means adjusting preventive and restorative methods to improve water-quality protection based on monitoring results. The general approach is to:

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1. Identify problems through systematic monitoring (see Monitoring section above);
2. Identify appropriate corrective actions;
3. Verify implementation of corrective actions;
4. Document implementation of corrective actions;
5. Report discrepancies and corrective actions in annual reports to State and Regional Boards.

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#### Response procedures for monitoring program components

##### 1. Annual BMP implementation checklist discrepancies

District and forest hydrologists will:

- a. Check with project administrator to verify discrepancies;
- b. Identify corrective actions in cooperation with project administrator;
- c. Conduct follow-up inspections to verify corrective actions;
- d. Document corrective actions in project file;
- e. Describe discrepancies and corrective actions in annual reports.

##### 2. Annual random BMPEP monitoring implementation failures

District and forest hydrologists will:

- a. Discuss failure with project administrator;
- b. Identify corrective actions;
- c. Conduct follow-up inspections to verify corrective actions;
- d. Document corrective actions in project file;
- e. Describe discrepancies and corrective actions in annual reports.

##### 3. Annual random BMPEP effectiveness failures

District and forest hydrologists will:

- a. Evaluate hydrologic conditions at the time of failure;
- b. Conduct field visit to determine causes of failure;
- c. Identify corrective actions;
- d. Verify implementation of corrective actions during the following year;
- e. Recommend measures to improve BMP effectiveness to the regional hydrologist;
- f. Document findings in project file and in annual report.

##### 4. Retrospective BMPEP effectiveness failures

District and forest hydrologists will:

- a. Evaluate hydrologic conditions most likely to have contributed to failure;
- b. Conduct field visit to determine causes of failure;
- c. Identify corrective actions;
- d. Verify implementation of corrective actions during the following year;
- e. Recommend measures to improve BMP effectiveness to the regional hydrologist;
- f. Document findings in project file and in annual report.

#### 5. In-channel monitoring (SCI)

- a. Annual results will be reviewed by the forest hydrologist to identify any current conditions or trends that indicate potential cumulative watershed effects.
- b. Forest watershed staff will identify preventive or restoration actions needed to improve channel conditions.
- c. Results of monitoring and a description of corrective actions will be included in annual reports.

#### 6. Field observations independent of systematic monitoring programs

- a. All USFS staff will report observations of existing or potential water-quality impairments immediately to the local line officer and forest hydrologist.
- b. Line officers will determine appropriate corrective actions.
- c. Forest hydrologists will report violations of basin plans to regional board staff.
- d. All water-quality impairments requiring corrective actions will be documented in annual reports.

#### 7. Storm patrols

- a. USFS staff assigned to storm patrol duties will be qualified to use the necessary tools to make emergency repairs to road drainage facilities.
- b. Road patrol teams will document locations of problems with GPS units and provide information on problem locations to the district or forest hydrologist.
- c. District and forest hydrologists will work with Engineering staff to prevent future recurrences.

#### Reporting

Each national forest will submit an annual **draft** monitoring report to the State [Water Board](#) and the appropriate Regional Boards [and make available to the public](#). The USFS Regional Office will submit an **draft** annual summary of monitoring results [to the State Water Board, appropriate Regional Boards and make available to the public](#) for all forests in the Pacific Southwest Region, and will compile a **draft** report containing a more detailed analysis and synthesis of monitoring results every 3 years.

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After submission of **draft** annual reports the USFS and water board staffs will meet each year, both at the forest level and the regional level, to review annual findings and finalize any recommendations for immediate change in the final report. Recommendations will include both those related to management activities as well as the monitoring program. It is expected that the scale of recommended change would be fairly limited during the annual reporting cycle, and primarily address change at the Forest level.

The 3 year report will consist of a much more in depth and detailed analysis and synthesis of findings to identify trends and causes for repeated BMP implementation and effectiveness deficiencies, and trends in stream channel conditions. Upon meeting with waterboard staff, this final 3 year report is when a more in-depth analysis of results would be used to develop a larger scope of recommendations related to changes in management direction or the monitoring program would occur. Any new findings from available relevant research would also be integrated into this four year synthesis report.

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Draft reports will be made available to stakeholders to review, to also provide comment and input in preparation of the final report, for the both the annual and 3yr Report.

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The finalized annual report as well as the 3yr report will then be submitted to the executive staff for both the USFS and the SWRCB for the consideration of management decisions as described in Section VII below.

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### Field Reviews

Annually complete a field review to visit and discuss implementation and effectiveness monitoring results. Forest Service and water board staffs should organize this event and locations should change each year. Stakeholders should be invited and may be asked to help select the sites for field visits Results of BMPEP evaluations should be discussed at these events Areas of non-compliance or ineffective BMPs should be included on the field visits. The goal for this work will be review and discuss the program in the field.

### Executive Management Decisions

A synthesis of findings and management recommendations from annual Reports and 3 year reports will presented to appropriate executive staff within the USFS and water boards. Based on this synthesis, Executive staff will initiate actions and appropriate decision documents following their respective agency processes to implement changes to either individual Forest practices, the State WQMP and/or the State WQMP AMS. These actions and decisions will be broadly communicated to agency staffs and stakeholders. Decisions and the rationale for the decisions will be described and documented in a Decision briefing. The Decision briefing will be made available to all interested parties and is intended to inform stakeholders, agency staff and scientists regarding the factors that drive management decisions.

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The following describes the process that will be utilized in case there is a need for dispute resolution, in carryout any phase of this AMS.

Stage 1: The Joint USFS Waterboard Science/Policy Teams must resolve technical issues within 6 to 12 months.

Stage 2: Implement mediation to facilitate consensus or agree to arbitration within 3 months following the initiation of Stage 2.

Stage 3: Submit the dispute to Agency Heads. Agency Heads make decision within 3 months following the initiation of Stage 3.

**Comment [TU20]:** I am not clear on the actual intent of the proposed dispute resolution, however, dispute resolution should not be a substitute for the regulator authority of the State Water Board to take actions to require the FS to meet water quality standards or impose consequences on the FS when they fail to comply with the regulations.



Stage 4: Submit the dispute to State or Regional Board.

### **VIII. Stakeholder and Public Consultation *(to be developed)***

Establish specific procedures and requirements for making information available to and consulting with stakeholders and members of the public.

### **IX. Information System *(to be developed)***

Describe specific requirements and process for using an information system to support information flow amongst and between agencies, as well as making processes and decisions transparent to interested parties.

| [X. Restoration of Legacy Sites \(I recommend adding this section back into the AMS\)](#)

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## 2. Responsibilities<sup>[TU1]</sup>

**Agency Executives:** Approve and sign State WQMP, which will include this AMS. Provide internal resources to support agencies' roles and responsibilities under the WQMP and management system. Direct actions and decisions based on recommendations provided in monitoring reports produced by staff and/or by the Joint USFS/Waterboard Science/Policy Team.

USFS Regional Office Staff<sup>[TU2]</sup>: Coordinate ongoing communication between USFS and Waterboard staff at Regional level. Coordinate synthesis of monitoring information collected and reported at the Forest level, to develop regional reporting of monitoring and research results. Coordinate annual reporting of region wide results, along with an annual training and workshop on monitoring techniques and results. Coordinate periodic (4 year intervals) comprehensive review of monitoring research results to inform and recommend modifications to either technical guidance documents (ie. BMP manuals) , or the AMS monitoring and research program.

USFS Forest Staff<sup>[TU3]</sup>: Implement Forest level monitoring as described in Section V. Use monitoring data collected during project to immediately inform and adapt project implementation to correct deficiencies and prevent harm to soil and water resources and beneficial uses. Report monitoring data to local regional waterboard staff and regional USFS staff as described in Section VI. Use annual reporting to share lessons learned, and recommend to line officers modifications to design features/BMPs, and administrative processes at the Forest level to improve planning, contracting, and implementation of Forest management activities.

Water board Staff: <sup>[TU4]</sup>Provide immediate feedback to USFS Forest Staff regarding Water board's independent monitoring inspections. Periodically attend BMPEP inspections and/or training to increase calibration among agencies. Review annual reports and provide feedback to USFS regarding report adequacy and implications. Meet annually to potentially revise structural and analytical elements of the adaptive management system.

Stakeholders : This process will be open to the stakeholder community who will review and comment on all aspects of the AMS program, including the monitoring strategies, monitoring reports, and management recommendations. Stakeholders may provide endorsement of State WQMP and AMS if they support the approach.