

California Regional Water Quality Control Board
North Coast Region

Monitoring and Reporting Program No. R1-2010-0029
(Revised March 21, 2012)

For

Categorical Waiver of Waste Discharge Requirements For
Nonpoint Source Discharges Related to
Certain Federal Land Management Activities
On National Forest System Lands
In the
North Coast Region

This Monitoring and Reporting Program (MRP) is issued pursuant to California Water Code section 13267(b) and is associated with the Categorical Waiver of Waste Discharge Requirements for Nonpoint Source Discharges Related to Certain Federal Land Management Activities on National Forest System Lands Order Number R1-2010-0029 (hereinafter referred to as “the Order” or “Waiver”). The reasons for requiring the Discharger to provide this information, and the evidence supporting this need, can be found in the Order. The Regional Water Quality Control Board has delegated its authority to the Executive Officer to revise, modify, and reissue the MRP.

Under the authority of the California Water Code section 13267(b), the Discharger named above is required to comply with the following:

Monitoring and Reporting Program

The current United States Forest Service (USFS or National Forest) Best Management Practices Evaluation Program (BMPEP) satisfies some Waiver monitoring elements, however additional monitoring is needed, particularly for Category B projects. Monitoring shall be conducted at a minimum level for all projects and activities, as described in section 1 below. This level of monitoring includes checklists for implementation of on-the-ground prescriptions to protect water quality, BMPEP evaluations for randomly selected current and recent projects, and inspections and patrols of roads and trails to prevent water-quality problems during storms. Additional monitoring will use either a watershed approach (i.e., Baseline In-Channel Monitoring, see section 2 below) or a project level approach (Project-triggered Monitoring, see section 3 below). Range allotments have specific monitoring requirements (see section 4 below).

The Klamath National Forest sediment and water temperature monitoring plan, *Klamath National Forest Sediment and Temperature Monitoring Plan and Quality Assurance Plan (KNF MRP)*, will be used to address the monitoring needs for this Waiver and TMDLs, as appropriate and to the extent those requirements overlap for the portions of the Klamath National Forest in the Scott, Shasta, Salmon, and Klamath River watersheds, unless additional monitoring is required by the Executive Officer. Monitoring efforts such as the use of checklists and implementation monitoring that are not specifically included in the KNF MRP but are required under this MRP shall also be required on Category B projects conducted on the Klamath National Forest.

This monitoring program relies on existing, well-documented monitoring methods. Monitoring for management activities will use BMPEP protocols (USFS 2001¹). In-channel monitoring will follow Stream Condition Inventory (SCI) protocols (USFS 2005) as the default monitoring methods. In addition, the State Board Surface Water Ambient Monitoring Program (SWAMP) protocols will also be consulted and incorporated, as appropriate. However, equivalent methods that are standardized and provide relevant information on water temperature, and sediment, and channel form will be considered by Regional Water Board staff, and may be used upon concurrence by the Executive Officer.

Unless otherwise stated, details regarding criteria and methods for decisions about sample site location, numbers of sites, sample pool selection for retrospective monitoring, and all other monitoring related items will be developed by USFS staff, in collaboration with Regional Water Board staff, prior to initiation of the monitoring program.

1. Monitoring for All Projects

A. Implementation Monitoring/Audit

Implementation monitoring will be conducted for all projects using a “checklist” approach and serving as an audit. Implementation monitoring will be the primary systematic means for early detection of potential water-quality problems stemming from failure to fully or properly implement all of the proposed measures for a particular project and will be conducted in the following manner:

1. Checklists will be developed by USFS project staff (timber, range, recreation, engineering, etc.) based on BMPs and their on-the-ground prescriptions identified in National Environmental Policy Act (NEPA) documents for each project during the project design phase and will be submitted with the project enrollment package for Regional Water Board staff review. All on-the-ground prescriptions for the project will be included in the checklist to ensure that all proposed measures in a project were actually implemented.
2. Checklists will be completed during field evaluations by USFS project staff and will be coordinated and reviewed by the Forest Hydrologists to ensure that any deviations from the project BMPs or on-the-ground prescriptions are corrected effectively.
3. Implementation monitoring will be completed early enough to allow corrective actions to be taken, if needed, prior to the release of contractors or the onset of the first winter after initiating project implementation.

¹ USDA Forest Service, 2001. Investigating Water Quality in the Pacific Southwest Region, Best Management Practices Evaluation Program: A User's Guide. USDA Forest Service, Pacific Southwest Region, Vallejo, CA.

4. Checklists may need to be completed several times during the life of most projects if the project contains multiple phases over a period of years.
5. The implementation monitoring will occur prior to ground-disturbing activities for planning phase BMPs, prior to winter periods following project implementation, and at the completion of the project.

B. Monitoring of current management activities and corrective actions

1. Best Management Practice Evaluation Program (BMPEP) Monitoring
 - a. 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 USFS lands at the hillslope scale. Corrective actions will be taken in response to recommendations made in the previous year's BMP monitoring report by the National Forests to address water-quality protection, and these actions will be documented in annual BMPEP reports. Follow-up monitoring will be conducted for sites that were not rated as fully effective the previous year, corrective actions will be implemented and documented, and results will be presented in annual BMPEP reports. National Forests will enter BMPEP results annually into the Regional BMPEP data base.
 - b. Random 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 staff resources to be used for non-random BMP evaluations and in-channel monitoring. Any alterations to monitoring of the BMPEP protocols will first be discussed and agreed upon by the USFS staff, the Regional Office, and Regional Water Board staff.

C. Road and trail patrols and inspections

The National Forests will develop road and trail patrol protocols that describe conditions under which road and trail patrols are appropriate, and include safety precautions, procedures for monitoring-including definitions of triggering events and other relevant criteria, corrective actions, and reporting. Use of existing protocols is acceptable given all relevant criteria are clearly defined within those protocols.

1. Each National Forest will develop road patrol protocols and do the following:
 - a. Develop a Forest specific road patrol plan using the protocols.
 - b. In accordance with the relevant protocols, the National Forests will conduct road patrols to the extent allowed by weather, safety, and road conditions along National Forest Transportation System (NFTS) roads

before, during and after major storms to prevent and repair damage to roads that may adversely affect water quality, OR to detect and correct road drainage problems that could affect water quality.

- c. Prepare reports for each storm or series of storms that involves a road-patrol response. Reports will be posted to the USFS water-quality web site and made available to the Regional Water Board upon request.
2. Where applicable, each National Forest will conduct Green-Yellow-Red (G-Y-R) Trail Condition Monitoring as described in *Revised OHV Trail Monitoring Form (GYR Form) and Training Guide*, USDA-Forest Service, Pacific SW Region, July 30, 2004, for the following purposes:
 - a. To identify OHV routes in need of maintenance and to prioritize maintenance activities. National Forests will schedule G-Y-R Trail Condition Monitoring so high-risk and high-maintenance routes are monitored annually. Monitoring of stable routes will be scheduled less frequently, but not more than every three years.
 - b. To identify and assess newly created unauthorized OHV use, and schedule restoration treatments for routes causing water quality impacts. The periodic inspections will be conducted within a 3-5 year time frame focusing on periods following large magnitude or duration (triggering) events. Monitoring time frames and definitions of triggering events shall be defined in the road and trail monitoring protocols.

D. Retrospective Hillslope Monitoring of Past Management Activities

The purpose of retrospective hillslope monitoring of past management activities is to evaluate the effectiveness of BMPs after they have been in place for 3 to 5 years. A subset of timber, engineering, and grazing projects completed in the past 5 years that were rated as effective as part of the initial random BMPEP monitoring will be selected for retrospective BMPEP effectiveness evaluations. Retrospective monitoring results will be compared to original BMPEP effectiveness scores to determine if BMPs remained effective over a period of years. Effectiveness will be evaluated in the following manner:

1. A sample pool of projects will be developed annually to evaluate projects where the BMPs were evaluated in the previous 3 to 5 years and that were rated as effective, and sites will be selected randomly from this pool for retrospective BMPEP effectiveness evaluations.
2. Retrospective BMPEP evaluations will follow the standard BMPEP protocols. If protocols change between the time of the original evaluation and the retrospective evaluation, the current protocol will be used.

3. Results of retrospective monitoring will be compared to original BMPEP effectiveness scores to determine if BMPs remained effective over a period of 3 to 5 years.
4. The recurrence interval (RI) for the highest rainfall (based on design storm criteria) during the period between the original and retrospective evaluations will be estimated for the rain gage nearest the site of the evaluation. Recurrence interval estimates will be compared to long-term effectiveness in national forest and regional BMPEP reports.

2. Baseline In-Channel Monitoring

In collaboration with the Regional Water Board, each National Forest will establish a network of baseline in-channel monitoring sites at the 5th field hydrologic unit watershed scale (as defined in National Resources Conservation Service (NRCS) 2007²). Establishment of this network eliminates the need for project-level monitoring within the monitored watersheds. Projects in watersheds that do not have baseline in-channel monitoring sites will be required to conduct project-level monitoring (described below under Item 3).

The purpose of in-channel monitoring of beneficial uses is to determine whether USFS BMPs collectively are effective in protecting and improving water quality at the watershed scale. BMP effectiveness will be assessed by monitoring trends in channel characteristics that affect beneficial uses, and by comparing measures of central tendency for channel characteristics of streams downstream of managed areas with those in reference watersheds (i.e. the paired watershed approach). Reference watersheds will be defined using the State Board SWAMP criteria (Ode, 2009). Managed watersheds are those that do not meet criteria for reference watersheds, and may include watersheds with 303(d) listed waters.

In-channel monitoring will follow the Stream Condition Inventory (SCI) Version 5.0 (USDA Forest Service Pacific Southwest Region, 2005) protocols. Alternative approaches that provide information on long-term channel geomorphic stability, quality of aquatic habitat, riparian shading, and bed substrate may be substituted for SCI protocols with the approval of the appropriate Regional Board Executive Officer. National Forests will enter in-channel monitoring results annually into the USFS NRM AQS data base, and the results will be made available to the Regional Water Board.

Representative in-channel monitoring sites will be selected for 5th field hydrologic units (a.k.a. watersheds), which are generally between 20 and 200 square miles in area. Each watershed in the baseline monitoring network will have one site representative of reference conditions and one site representative of managed

² Natural Resource Conservation Service, 2007. Watersheds, Hydrologic Units, Hydrologic Unit Codes, Watershed Approach, and Rapid Watershed Assessments. June 2007: 2pp.
http://www.nrcs.usda.gov/programs/rwa/Watershed_HU_HUC_WatershedApproach_defined_6-18-07.pdf

conditions. Fixed long-term monitoring locations will be selected by National Forest and Regional Office aquatic ecologists, fisheries biologists, soil scientists, and hydrologists in cooperation with the Regional Water Board staff to represent areas of similar landform, geology, climate, and vegetation. Monitoring sites will be carefully selected to represent large landscapes within the national forest system. Detecting downstream channel changes related to upstream activities in large watersheds is problematic (MacDonald and Coe 2006³), so monitoring sites will be located on smaller headwaters streams (6th or 7th field Hydrologic Units, also known as subwatersheds). Paired headwater monitoring sites (managed and reference) will be selected to have similar valley segment and stream reach characteristics (Bisson et al 2006⁴).

In-channel monitoring will be done as follows:

- A. Each National Forest shall conduct annual SCI surveys, with the goal of monitoring each 5th field watershed at least once every 5 years and as soon as possible following major (Recurrence Interval (RI) >10 year) floods. Roughly 20% of the watersheds will be surveyed each year, on average. Survey locations will be rotated among all 5th field watersheds within each 4th field watersheds. For repeat surveys, the recurrence interval of the highest peak flow between consecutive surveys will be estimated and reported.
- B. SCI sites will be selected to minimize variability in channel type both within and between 5th field watersheds.
- C. For watersheds that are 303(d) listed for pollutants other than sediment and water temperature, additional parameters may be monitored to assess progress in reducing pollutant loads. Examples include nutrients and bacteria. Monitoring frequency and protocols for this additional monitoring will be determined on a case by case basis. [note: SCI includes Solar Pathfinder and water temperature monitoring]
- D. Forests shall use SCI monitoring results for reference watersheds to develop reference conditions for channel geomorphology, aquatic habitat, bed substrate and water temperature and shading. Results from managed sites will be analyzed by the Forests in collaboration with the Regional Water Board to determine if they differ significantly from results from reference sites, and if so, whether beneficial uses are being adversely affected. Results will be used to prioritize watersheds for restoration activities (refer to Order R1-2010-0029 Items 3 and 6.)

³ MacDonald, L.H., and Coe, D., 2006. Influence of headwater streams on downstream reaches in forested areas. USDA, Forest Science, 53(2): 148-168.

⁴ 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: 23-49.

Sites will be removed from or added to the sample pool as needed by agreement with the Regional Office, the affected National Forest, and the Regional Water Board staff. In the event that suitable reference or managed sites cannot be identified, the National Forest will work with the Regional Water Board staff to identify suitable alternatives.

3. Project-triggered Monitoring

Category B projects that are located within 5th-field watersheds where the Baseline In-Channel Monitoring is not being conducted (as described in section 2 above) will have the following project-triggered monitoring⁵:

A. Project level in-channel beneficial use monitoring

Conduct in-channel monitoring as described in section 2 above at a sampling site selected at or near the downstream end of the project. If a suitable location cannot be cited downstream of the project area, an alternative location or watershed scale may be proposed as appropriate and must be jointly agreed upon by the USFS and Regional Water Board staff. Conduct monitoring once before any ground-disturbing project activities and once within one year after the end of ground-disturbing project activities.

1. For watersheds that are 303(d) listed for pollutants other than sediment, nutrient, and temperature additional parameters may be monitored to assess progress in reducing loads. Examples include stream temperature, nutrients, and bacteria. Monitoring frequency and protocols for this additional monitoring will be determined on a case by case basis. Temperature monitoring will include, but not limited to, water temperature for at least one full snow-free season and measures of effective shade using Solar Pathfinders.
2. SCI sites will be selected to match as closely as possible the channel characteristics of baseline SCI monitoring sites described in item 2 above.
3. If SCI results indicate adverse impacts to channels from project activities, restoration plans will be developed and implemented before waiver enrollment is terminated. Adverse impacts will be determined by comparison of pre-project to post-project SCI results.

B. Non-random BMPEP evaluation of high-risk activities

1. Projects will have non-random BMPEP evaluations for all high-risk activities at least once for each activity during the waiver enrollment. High-risk activities include road construction or reconstruction, construction, repair, or

⁵ The Executive Officer may consider reduction or modification of project-triggered monitoring for specific projects depending on site specific characteristics of the project and/or its location.

removal of road-stream crossings, and all activities, including livestock grazing, within designated riparian protection zones (riparian reserves, Riparian Conservation Areas, streamside management zones).

2. Follow-up BMPEP monitoring for sites that were evaluated and rated as "not effective" the previous year will be conducted to determine if corrective actions have been taken.

4. Range Allotment Monitoring

The USFS will conduct in-stream monitoring for fecal indicator bacteria (FIB) in selected representative high-use recreation sites. In addition, the USFS will conduct annual and long-term monitoring of key riparian areas within range allotments.

A. Fecal indicator bacteria (FIB) monitoring in high-use recreation areas in or downstream of active range allotments will be conducted in the following manner:

1. The USFS and the Regional Water Board staff will collaborate to identify and prioritize designated high-use water-contact recreation sites that are within or immediately downstream of active grazing allotments with recently developed BMPs.
2. A minimum of one such site within the North Coast Region will be monitored annually.
3. Suitable sites may be substituted from year to year as agreed upon by the National Forests and Regional Water Board.
4. At each FIB monitoring site, USFS will collect samples for fecal indicator bacteria analyses within the high-use recreation area water during the grazing season at intervals sufficient to determine compliance with basin plan objectives. Standard sampling methods and commercial labs will be used.
5. If Basin Plan Objectives are exceeded, USFS will collect additional samples upstream and downstream of the high-use recreation area to isolate influences of humans, livestock, and other possible sources.
6. The results will be reported at least annually to the Regional Water Board.

In addition:

7. FIB monitoring will be conducted on one "best" USFS grazing allotment in the North Coast Region to verify the "best-case" performance of the USFS BMPs and their implementation

8. The FIB monitoring results will be compared with results of USFS annual vegetative monitoring of range allotments to see if there is a good correlation that would allow extrapolation of vegetative monitoring to estimate FIB concentrations within allotments that are not monitored for FIB.

B. The following monitoring activities will be conducted on all covered allotments:

1. Assessments of rangeland condition and trend shall be performed once every five years on selected allotments in key areas to track the ecological trend of upland and meadow vegetation. Assessments will include monitoring of rooted frequency, riparian greenline width, and streambank stability.
2. Allotment inspections shall be performed to ensure stocking rates, season of use, allotment boundaries, and range improvement terms are within the terms and conditions of grazing permits.
3. Utilization monitoring shall be performed at a minimum at the end of the grazing season to ensure compliance with forage utilization limits and other requirements included in the terms and conditions of the permit.
4. BMPEP shall be performed annually for randomly selected allotments to assess implementation and effectiveness of BMPs identified in Water Quality Management for Forest System Lands in California, Best Management Practices (USFS, Pacific Southwest Region, 2000 or as updated and amended). This monitoring will assess whether site-specific BMPs have been developed and implemented, as well as vegetation and riparian condition.

5. Reporting

Each National Forest shall prepare reports discussing the evaluations and observations resulting from the various monitoring efforts required pursuant to this Order. In addition to the Discharge Notifications (DNs) required under General Condition 38 of the Waiver, the following reports are required to be submitted to the Regional Water Board:

- A. An annual report summarizing and discussing the results of the monitoring efforts required by this Order. These reports shall be submitted to the Regional Board by March 15 of each year following the monitoring. Annual reports shall contain sufficient information that Regional Water Board staff can clearly identify the types of monitoring that was conducted through out the project area and key results, findings, problems encounters, and corrective actions taken. The reports shall also include, but may not be limited to:
 1. Maps of the National Forest showing the project areas and sites where monitoring, including baseline in-channel and project-level monitoring, was conducted;

2. The type of monitoring that was conducted at each location, including a reference to the required monitoring section;
3. Findings and analysis of the collected data;
4. Information pertinent to any corrective actions that have been or need to be taken to ensure adequate water quality protection.

Regional Board staff will review the reports and provide each Forest with comments, as necessary. The comments will be discussed with each Forest, and any agreed-to changes will be incorporated into the next year's monitoring.

- B. Field data sheets, including completed implementation checklists, and any other relevant information related to monitoring such as but not necessarily limited to any water quality sample results will be made available to the Regional Water Board upon request.
- C. By no later than March 15, 2014⁶, each National Forest shall prepare and submit a detailed report summarizing the results of the various monitoring efforts and hydrologic conditions over the monitoring period. Report content and details will be developed in consultation with Regional Water Board staff such that the report can be utilized to evaluate the Waiver and inform possible revisions to the Waiver.

5. Quality Assurance and Quality Control Project Plan (QAPP)

Each National Forest is engaged in a variety of activities and projects. The type of monitoring appropriate for each project will vary according to the activities associated with each project. Therefore, it is necessary to prepare and submit a Quality Assurance and Quality Control Project Plan (QAPP) prior to the initiation of any monitoring activity.

- A. Within one year or before any monitoring component is initiated, whichever comes first, the USFS shall develop, in consultation with Regional Water Board staff, a comprehensive QAPP for the monitoring and reporting activities to be implemented. The QAPP shall address all aspects of the monitoring program and shall contain, at a minimum, but not be limited to:
 1. Standard procedures for the establishment of repeatable sampling locations;
 2. Standard operating procedures for each field method and piece of field equipment used;
 3. Standard operating procedures for each laboratory method and piece of laboratory equipment used;

⁶ Note this is eighteen months prior to the expiration of Order R1-2010-0029,

4. Standard reporting procedures;
 5. Measures for quality assurance associated with monitoring and reporting procedures;
 6. Measures for quality control associated with monitoring and reporting procedures;
 7. A training program for personnel conducting monitoring activities; and,
 8. Measures for adapting the QAPP, when necessary. The USFS may propose to use an existing QAPP for these measurements as long as it addresses the above list of elements.
- B. Following implementation of the approved QAPP, the USFS may propose changes to the procedures and control measures specified in the QAPP as necessary, in consultation with Regional Water Board staff for input. Following approval of changes to the QAPP, the USFS shall document such changes and implement the new procedures and control measures immediately.

6. Request for Extensions

Requests for extensions to required time lines specified within this Monitoring and Reporting Program shall be submitted, in writing, at least 10 working days prior to the due date. Requests for extension must provide a reason or reasons for the request. Approval of any request for an extension of time to comply with required deadlines is subject to the approval of the Regional Water Board's Executive Officer. If written approval is not received, it should not be assumed that the due dates are extended indefinitely or have been approved. USFS shall be accountable for all due dates set out in this Plan in the absence of written approval from the Executive Officer.

Ordered by: _____
Catherine Kuhlman
Executive Officer

Date: March 21, 2012