State Water Resources Control Board

Monitoring and Reporting Program No. WQ 2011-XXXX

For

Waiver of Waste Discharge Requirements for
Nonpoint Source Discharges Related to
Certain Activities on National Forest System Lands in California

This Monitoring and Reporting Program (MRP) is issued pursuant to California Water Code sections 13267(b) and 13269(a)(2) and is associated with Order No, WQ 2011-XXXX the Waiver of Waste Discharge Requirements for Nonpoint Source Discharges Related to Certain Activities on National Forest System Lands in California (hereinafter referred to as "the Order"). The reasons for requiring the U.S. Department of Agriculture, Forest Service (USFS) to provide this information, and the evidence supporting this need, can be found in the Order.

This MRP does not supersede other more specific monitoring agreements that individual Water Board Regions and National Forests may execute, nor does it preclude the Executive Officer of an affected Regional Water Board from, where warranted in specific cases, imposing requirements more stringent than set forth herein. The Executive Director of the State Water Board may revise, modify, and reissue the MRP.

Under the authority of the California Water Code sections 13267(b) and 13269(a)(2), USFS is required to comply with the following:

Monitoring and Reporting Program

The current USFS 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).

This monitoring program relies on existing, well-documented monitoring methods. Monitoring for management activities will use BMPEP protocols (USFS 2001[1]). 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 State Water Board staff, and may be used upon concurrence by the Executive Director.

[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.

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 State and 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 will serve as an audit that project-specific on-the-ground prescriptions to address potentially significant environmental impacts are instituted as proposed and approved. 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. Following guidance provided by the USFS Regional Office, National Forest project staff (timber, range, recreation, engineering, etc.) will develop project-specific checklists based on BMPs and the on-the-ground prescriptions identified in National Environmental Policy Act (NEPA) and other project documents for each project during the project design phase.

2. Each National Forest shall do the following:

    a. Include in the checklist all on-the-ground prescriptions for the project to ensure that all proposed measures in a project were actually implemented.
    b. Complete the checklists during field evaluations by project staff.
    c. Coordinate review with the Forest Hydrologists to ensure that any deviations from the project BMPs or on-the-ground prescriptions are corrected effectively.
    d. Complete implementation monitoring 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.
    e. Perform implementation monitoring prior to ground-disturbing activities for planning phase BMPs, prior to winter periods following project implementation, and at the completion of the project.
    f. Submit the checklist with the project enrollment package for Regional Water Board staff review of Category B activities.

3. A National Forest may need to complete checklists several times during the life of most projects if the project contains multiple phases over a period of years.

B. Monitoring of Current Management Activities and Corrective Actions

1. Best Management Practice Evaluation Program (BMPEP) monitoring

The BMPEP, with random site selection, will continue to be the primary means of programmatically assessing the implementation and effectiveness of water quality protection for current projects on USFS lands at the hillslope scale.

a. Each National Forest shall do the following:

1) Implement the BMPEP program and enter its BMPEP results, including recommendations for corrective actions to protect water quality, annually into the Regional BMPEP data base;
2) Conduct follow-up monitoring at sites where BMPs were rated as not fully effective the previous year;
3) At such sites, and at sites where corrective actions were recommended the previous year, carry out necessary corrective actions and document such actions in its annual BMPEP reports.

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 staffs of the National Forest, the Regional Office, and the State Water Board.

C. Road and Trail Patrols and Inspections

The purpose of road and trail patrols and inspections is to detect and correct damage on roads and off-highway vehicle (OHV) trails that may adversely affect water quality in a timely manner in order to avoid or minimize such effects.

1. Each National Forest will develop appropriate protocols and plans for patrolling and inspecting both National Forest Transportation System (NFTS) roads and OHV routes and trails. Use of existing protocols is acceptable given all relevant criteria are clearly defined within those protocols. Protocols will address factors such as weather, safety, and road conditions. Road patrol plans will describe conditions under which road patrols are appropriate, and include safety precautions, and procedures for monitoring, corrective actions, and reporting.

2. For roads, each National Forest will do the following:

   a. In accordance with the relevant protocols and plans, conduct road patrols to the along before, during and after major storms to prevent and repair road damage to detect and correct road drainage problems that could affect water quality.
   b. 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.

3. For OHV trails, each National Forest will do the following:

   a. Where applicable, conduct Green-Yellow-Red (G-Y-R) Trail Condition Monitoring[2] to identify OHV routes in need of maintenance and to prioritize maintenance activities.
   b. 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.

[2] As described in Revised OHV Trail Monitoring Form (GYR Form) and Training Guide, USDA-Forest Service, Pacific SW Region, July 30, 2004

c. Conduct periodic inspections of OHV routes 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 monitoring protocols.

C. 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. Retrospective monitoring will be conducted on a subset of projects completed in the past 5 years for which the BMPs were initially rated as effective. Retrospective monitoring results will be compared to original BMPEP effectiveness scores to determine if BMPs remained effective over a period of years.

1. Each National Forest will do the following:

   a. Annually develop a sample pool of timber, engineering, and grazing projects in the project subwatershed (6^{th} field scale) where the BMPs were evaluated in the and were rated as effective the initial random BMPEP monitoring conducted during the previous 3 to 5 years
   b. Randomly select sites from this pool for retrospective BMPEP effectiveness evaluations.
   c. Follow the standard BMPEP protocols during these retrospective BMPEP evaluations. If protocols change between the time of the original evaluation and the retrospective evaluation, the current protocol will be used.
   d. Compare results of retrospective monitoring to original BMPEP effectiveness scores to determine if BMPs remained effective over a period of 3 to 5 years.
   e. Estimate the recurrence interval (RI) for the highest rainfall (based on design storm criteria) during the period between the original and retrospective evaluations from the rain gage nearest the site of the evaluation.

2. Recurrence interval estimates will be compared to long-term effectiveness in National Forest and Regional Office BMPEP reports.

2. Baseline In-Channel Monitoring

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[3].

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 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. Sites will be removed from or added to the sample pool as needed by agreement with the Regional Office, the Forest, and the Regional Board staff.

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 2006[4]), 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, 2006[5]).

In addition, each National Forest shall do the following in collaboration with each affected Regional Water Board:

A. Establish a network of baseline in-channel monitoring sites at the 5th field hydrologic unit watershed scale[6]. SCI sites will be selected to minimize variability in channel type both within and between 5th field watersheds.

B. In the event that suitable reference or managed sites cannot be identified, work to identify suitable alternative sites.

C. 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

[3] For watersheds that are 303(d) listed for pollutants other than sediment and water temperature (e.g., nutrients and bacteria), additional parameters may be monitored to assess progress in reducing pollutant loads. 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.

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

[5] 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.

[6] As defined in 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

field watersheds. For repeat surveys, the recurrence interval of the highest peak flow between consecutive surveys will be estimated and reported.

D. Enter in-channel monitoring results annually into the USFS NRM AQS data base, and make them available to each affected Regional Water Board.

E. Use SCI monitoring results for reference watersheds to: 1) develop reference conditions for channel geomorphology, aquatic habitat, bed substrate and water temperature and shading and 2) prioritize watersheds for restoration activities (WQMH Chapter 5, Waiver findings 5.b.3), 11.c., 46, and 48; Waiver statewide general conditions 2 and 18).

F. Analyze results from managed sites to determine if they differ significantly from results from reference sites, and if so, whether beneficial uses are being adversely affected.

G. If monitoring results indicate adverse impacts to beneficial uses, the watershed will be considered during annual prioritization for restoration.

Establishment of this network eliminates the need for project-level monitoring within the monitored watersheds. Category B 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).

3. Project-triggered Monitoring for Category B Projects

USFS will conduct the following monitoring for Category B projects that are located within NFS 5th-field watersheds where the Baseline In-Channel Monitoring is not being conducted (as described in section 2 above) and where cumulative watershed effects equal or exceed thresholds of concern (FSH 2509.22 Soil and Water Conservation):

A. Project-level In-channel Beneficial Use Monitoring

Each National Forest shall do the following:

1. Select SCI sampling sites above and at or near the downstream end of the project and closely matching the channel characteristics of baseline SCI monitoring sites described in item 2 above. 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 Regional Water Board staff.
2. Once before any ground-disturbing project activities and once again within one year after the end of ground-disturbing project activities, conduct in-channel monitoring (as described in section 2 and footnote 3 above) at the selected sampling sites.
3. If SCI results indicate adverse impacts to channels from project activities, develop and implement restoration plans 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. Each National Forest shall use BMPEP protocols to evaluate 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 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. Each National Forest shall conduct follow-up BMPEP monitoring for sites that were evaluated and rated as “not effective” the previous year 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

1. The USFS and each affected Regional Board 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 will be monitored annually in each of the following water quality Regions: North Coast, Central Valley and Lahontan.
3. Suitable sites may be substituted from year to year as agreed upon by each National Forest and each affected 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 violated, 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. USFS will report results at least annually to the State and Regional Water Boards.

B. Other FIB Monitoring and Use

1. USFS will conduct FIB monitoring on one "best" USFS grazing allotment in the state to verify the "best-case" performance of the USFS BMPs and their implementation.
2. USFS will compare the FIB monitoring results 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.

C. Monitoring on All Covered Grazing Allotments

Each National Forest shall do the following:

1. Assess rangeland condition and trend 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. Inspect allotments to ensure stocking rates, season of use, allotment boundaries, and range improvement are within the terms and conditions of grazing permits.

3. Monitor range utilization monitoring 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. Perform BMPEP monitoring annually for randomly selected allotments to assess implementation and effectiveness of the WQMH BMPs. This monitoring will also assess vegetation and riparian condition.

5. Reporting

Each National Forest shall prepare reports discussing the evaluations and observations and corrective actions resulting from the various monitoring efforts required pursuant to this Order. In addition to the discharge notifications required under the Waiver's statewide general condition 28, the following reports are required to be submitted to the State Water Board and affected Regional Water Boards:

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 project area identifying the entire project showing the watersheds and site 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 Water Board staff will review the reports and provide each National 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 an affected Regional Water Board upon request.

By no later than June 6, 2015[7], USFS shall prepare and submit a detailed report summarizing the results of the various monitoring efforts, any resulting corrective actions, and changes in hydrologic conditions over the monitoring period. Report content and details will be developed in consultation with State Water Board staff such that the report can be utilized to evaluate the Waiver and inform possible revisions to the Waiver.

[7] Note this is eighteen months prior to the expiration of Order ------.

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

USFS 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, USFS shall develop, in consultation with State 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;
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, USFS may propose changes to the procedures and control measures specified in the QAPP as necessary, in consultation with State Water Board staff for input. Following approval of changes to the QAPP, USFS shall document such changes and implement the new procedures and control measures immediately.

7. 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 State Water Board's Executive Director. 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 Director.

Ordered by:

Date

Tom Howard
Executive Director