

Monitoring

Monitoring is critical component of each of the action alternatives. Specific resource monitoring includes the following types of monitoring:

Implementation Monitoring

Implementation monitoring includes a combination of administrative controls on project preparation, review of completed plans, and inspections during operation to ensure that project activities are accomplished consistent with any decision associated with this analysis. Administrative controls include having qualified staff prepare contracts and plans to implement the actions. Those plans are reviewed by higher level staff or Line Officers to ensure the plans include required resource protections measures. Project implementation is overseen by qualified staff with the delegated authority to make sure the project is implemented according to the approved plans, and to take corrective action during project implementation if actions are not in compliance with the approved plans.

Effectiveness Monitoring

Effectiveness monitoring includes site review after treatments to determine if the required measures achieved the intended results. Examples include post burn surveys to determine if adequate ground cover remains after treatment. The protocols associated with the Best Management Practices Evaluation Program (BMPEP) will be applied concurrently with treatments to provide “real time” monitoring of the effectiveness of water quality protection measures.

Vegetation

Determine changes in canopy cover, stand density and tree numbers, stocking of plantations and survival in plantations. In addition, areas scored as potential fisher rest sites using the habitat score cards during marking will be revisited for monitoring. This monitoring will allow comparison of stand structure following treatments and objectives in the FEIS.

Direct effects to canopy cover, stand density and tree numbers will be measured using a variable radius plot to measure trees larger than 5” in diameter. Plots will be placed using a randomly grid over 25 percent of the stands. Ten percent of the plots will be placed in stands that receive a thinning from below treatment (CA Spotted Owl Study) and the remainder will be in stands that receive the uneven-aged treatment. Plots will be located outside of plantations or shelterwood plant aggregations. Variable structure plots will be taken within 3-years after the three major phases of activity are completed in stands (mechanical treatments and prescribed fire).

In addition, plots will be placed within planted areas to determine survival and stocking in compliance with NFMA. Plots will use the regional standard staked tree plots.

- 1-years after planting.
- 3-years after planting
- 5-years after planting

Twenty five percent of areas identified by score cards will be visited to determine if they remained intact following treatments. A variable plot will be placed in the center of the score card site and the DBH of trees over 5” in diameter will be measured. Score card plots will be taken within 3-years after the three major phases of activity are completed in stands (mechanical treatments and prescribed fire).

BMP evaluations T01: Streamside Management Zones; T02: Skid Trails; T04: Landings; T06; Special Erosion Control and Revegetation; and T07: Meadow Protection will be conducted on selected treatment units following the R5 Best Management Practices Evaluation Program (BMPEP). Where herbicides are used for silvicultural purposes, evaluation V28: Vegetation Manipulation will be conducted in selected units. See the description of watershed monitoring for more information.

Transportation

Monitoring includes review of road contract packages and maintenance standards to insure that mitigation and design measures are implemented. Road projects are supervised by qualified inspectors to ensure that measures are implemented and corrective action is taken if those measures are not implemented correctly.

BMPEP evaluations E08: Road Surface, Drainage, and Slope Protection; E09: Stream Crossings; E11: Control of Sidecast Material; and E13: In-Channel Construction Practices will be conducted on selected road segments where road reconstruction or maintenance occurs. See the description of watershed monitoring for more information.

Fuels – Prescribed Fire Monitoring

Direct and indirect effects of prescribed burns will be monitored using a modified National Park Service format. Monitoring plots will be initiated for all prescribed burn units using the Browns Planar Intercept method to collect pre- and post- burn dead and down fuel loading, and duff and litter consumption, and to inventory overstory and understory vegetation, brush, and down logs, soil hydrophobicity, and post burn severity. Plots are permanent and are re-monitored immediately post burn (as conditions warrant), and at one, three and five years post burn. Plots are reset prior to second entry burns. Monitoring will not be done on pile burn projects.

BMPEP evaluation F25: Prescribed Fire will be conducted in selected burn units. Evaluation V28: Vegetation Manipulation will be conducted in selected treatment units to evaluate tractor piling, mastication, and other mechanical treatments. See the description of watershed monitoring for more information.

Botany/Noxious Weeds – Plant Species Composition and Invasive Plant Monitoring

The objectives of plant community monitoring will be to detect changes in percent cover of invasive weeds in relation to native and desirable non-native plant species. Sampling will be conducted in the spring, prior to flowering of yellow starthistle or other species of concern, and annually thereafter. A simple but effective permanent transect configuration will be used, whereby a baseline transect is laid out in an area selected to represent a dense infestation, and four transects are placed perpendicular to the baseline. Point intercept is recorded along each of the four transects: species encountered at each 0.5 m or 1 m points along each transect are recorded. Transect locations will be permanently marked, and photographs will be taken at of each of the four transects. Three such sets of transects will be placed in each infestation of one acre or greater.

Wildlife

Wildlife monitoring is tied to the Adaptive Management program outlined in the Chapter 2.

Soils

Monitoring of soil conditions will be conducted on a selection of activity areas to determine if soil standard and guidelines are being met for the project. Monitoring will be done in accordance to the regional protocol that has been developed for the Sierra Nevada Framework (TenPas 2005). Soil monitoring will be conducted along transects according to the protocol before and after the proposed treatments. Soil monitoring will be designed to determine the extent of detrimental soil compaction from mechanical treatments and soil cover should be determined from both mechanical treatment and prescribed fire. During the implementation of the proposed action pre-treatment soil transects should be established in activity areas that will be implemented during the next year and post-treatment soil transects should be repeated along the same transect that was established for the pre-treatment soil transect. Timing for conducting post-treatment soil transects is important to determine soil cover after prescribed fire, especially soil cover condition going into the following winter. Thirty five pre-treatment soil transects have been established in the El-o-win, Providence 1, Providence 4 and Bear_fen project areas to determine the existing soil condition (Alvarado and Gallegos 2005). These same soil transects will be repeated after treatment is implemented. If soils transect data finds that soil compaction is exceeding regional standard and guidelines, then additional sub-soiling will be conducted through the timber sale contract to meet regional standards and guidelines. If soil cover guidelines are not being met, then modifications to the implementation of mechanical treatment and or prescribed fire will be established to meet regional standards and guidelines.

Watershed

BMPEP evaluation T05: Timber Sale Administration will be conducted to evaluate the effectiveness of the TSA in enforcing the Timber Sale Contract. All other BMP monitoring will be coordinated and facilitated by Watershed staff.

The SNF conducts BMP evaluations on sites randomly selected from all recent vegetation management projects and road work performed on the Forest in order to provide data suitable for Region-wide interpretation, as described in the Best Management Practices Evaluation Program (BMPEP) User's Guide (USDA 2002). Sites in this project may or may not be randomly selected. However, since this project represents a large proportion of the Forest's active timber, fuels, and road reconstruction programs, the chance of KRP activities being randomly selected is good.

Additional non-random BMP monitoring will also occur, in accordance with the requirements of the Central Valley Regional Water Quality Control Board's Waiver of Discharge Requirements for Discharges Related to Timber Harvest Activities (Resolution No. R5-2005-0052). In selecting additional sites, emphasis will be placed on activities in sub-watersheds with CWE concerns. One of the areas of focus should be at road stream crossings.

BMP monitoring may be performed by employees in Resources, Engineering, or Timber, or by a small interdisciplinary group. Annual training in BMP monitoring will be provided by qualified Resources staff for all employees participating in data collection. Quality control will be provided by Resources, and will consist of revisiting a sample of monitored sites to ensure consistency with protocols.

The 2004 BMPEP Monitoring Results Report (USDA 2004) found that SMZs had the lowest implementation and effectiveness ratings of any timber management BMP monitored under the program. In accordance with the action plan presented in that report, SMZ implementation and effectiveness monitoring will be an emphasis for this project.

Watershed effectiveness monitoring is tied to the Adaptive Management Plan outlined in Chapter 2.

Results will be summarized annually and reported to the District Ranger, the Forest Watershed Staff Officer, the Regional Hydrologist, and the Central Valley Regional Water Quality Control Board.

Aquatics

Stream habitats for resident trout species and western pond turtles – see Adaptive Management Section in Chapter 2 for stream channel condition monitoring

Population inventory and subsequent monitoring for relictual slender salamander, resident trout species and western pond turtle viability will need to occur prior to project implementation and every three to five years afterward for the life of the Kings River Project.

Yosemite toad population and habitat monitoring – see Adaptive Management Section in Chapter 2 for Yosemite toad

Inventory and monitoring of stream crossings that impede aquatic species passage will be evaluated using the protocols and information provide by the Region 5 Aquatic Passage Cadre.

Annually monitor water temperature and water quality within each of the management and control units for the life of the Kings River Project.

Heritage

According to the Regional Programmatic Agreement (PA), the Forest shall conduct monitoring to ensure the effectiveness of the standard protection measures (IV.A.), or to prevent the loss of unidentified heritage resources (IV.D.). Heritage Resource Managers will determine the schedule and requirement for any monitoring based on the timing of project implementation, the type of project activity, and the locations of known cultural resources. Monitoring results will be documented in the Forest's annual report on Regional PA accomplishments.

Human Health for Glyphosate and R-11 Application

Herbicide use is proposed for the Kings River Project area in selected areas. There is little chance glyphosate or the surfactant R11 will reach waterways, following application by ground spraying; however in response to concerns by Californians for Alternatives to Toxics, the District plans to carry out monitoring to test for glyphosate and R11 in waterways.

Sample Collection: Background data for this project will be collected prior to application. When a perennial stream is adjacent to an application area, one sample will be gathered from the stream above and below the application area prior to spraying glyphosate and R-11. Sample collection will be accomplished according to Standard Methods. (Standard Methods, 20th edition, page 1-27, 1-28)

Sample bottles will be obtained from a certified water quality laboratory. Bottles will be prepared by the laboratory in accordance with standard methods for the detection of glyphosate. (page 6-114). Sample bottles for R-11 only need to be one liter plastic or glass. Samples will be collected for analysis of both glyphosate and R11.

1. Samples will be collected the day prior to the application.
2. The day of the application, samples will be collected immediately following application of the chemicals.
3. Additional samples will be collected daily during project implementation.

Additional sampling at the same locations in perennial streams adjacent to application areas will be collected following a significant rain event within 90 days of application. Significant means a rain that result in overland runoff.

Quality Control:

1. A blank sample of distilled water in a similar container for each chemical will be included with the transported samples for quality control. It will be labeled similarly to the other bottles. It should not be labeled as Distilled Water.
2. Individual(s) collecting the samples will not be allowed to come in contact with any spray apparatus, or bulk containers of glyphosate or R-11. Samplers will not ride in vehicles with people doing the application or come in contact with them during or after application or mixing of chemicals.
3. A spiked sample containing the chemicals may be used as a test for the laboratory accuracy.

Transportation and Storage: All samples will be iced to 2° C, kept away from light and transported to the laboratory the same day of sampling or the following Monday if a weekend (samples may be safely stored up to 2 weeks under these conditions (pg 6-114, B, 2))

Chain of custody procedures will be followed using the laboratory's forms. (pg 1-30)