

Appendix E: Best Management Practices

The use of the following mitigation measures and recommendations will enable the implementation of the proposed action or action alternatives in and around Riparian Reserves and prevent negative impacts to Riparian Reserves. All mitigation measures and recommendations are presented within the context of Best Management Practices.

Best Management Practices (BMPs) should be applied for all activities occurring in the Pilgrim Vegetation Management Project Area. A complete description of each best management practice is provided in the publication 'Water Quality Management for National Forest System Lands in California' (USDA, 2000). While all applicable BMPs should be applied to each proposed activity, the following BMPs are emphasized in order to protect aquatic and riparian resources in and adjacent to Riparian Reserves.

Timber Harvest BMPs

1-1: Timber sale planning process. The objective of Practice 1-1 is to incorporate water quality and hydrologic considerations into the timber sale planning process. This BMP is addressed by including a soil scientist, botanist and hydrologist on the ID Team for the Pilgrim Vegetation Management Project. This report documents water quality and hydrologic considerations as identified by the resource specialists, Pilgrim Vegetation Management ID Team, and public scoping.

1-2: Timber harvest unit design. The objective of Practice 1-2 is to ensure that timber harvest unit design will secure favorable conditions of water quality and quantity while maintaining desirable stream channel characteristics and watershed conditions. This practice was implemented by ground verifying hydrologic conditions for all units that were in close proximity to or within Riparian Reserves.

1-3: Determination of surface erosion hazard for timber harvest unit design. The objective of Practice 1-3 is to identify high erosion hazard areas in order to adjust treatment measures to prevent downstream water quality degradation. The erosion hazard for soils in the *Pilgrim* Project Area was assessed by a soil scientist using the Soil Resource Inventory for the project area. This survey is used to determine the soil mapping unit for each of the proposed management areas. The interpretations listed in the soil map unit description include an assessment of the Erosion Hazard Rating (EHR). This rating was made using the USDA Forest Service Soil and Water Conservation Handbook (FSH 2509.22), Computation of Erosion Hazard Rating (2/90).

1-4: Use of sale area maps (SAM) and/or project maps for designating water quality protection needs. The objective of Practice 1-4 is to ensure recognition and protection of areas related to water quality protection delineated on a SAM or Project Map. This practice will be accomplished by displaying all stream channels located adjacent to or within the units on the Sale Area Map and the Project Map for Timber Sale Contract.

1-5: Limiting the operating period (LOP) of timber sale activities. The objective of Practice 1-5 is to ensure that the purchasers conduct their operations, including erosion control work and road

maintenance in a timely manner and within the timeframe specified in the timber sale contract. The extent of the wet weather and snowmelt season in Northern California can be very unpredictable, therefore a fixed LOP for wet weather conditions will not be set for any of the proposed actions described in the Pilgrim EIS. Timber sale contract provision B6.6 can be used to close down operations because of wet weather, high water, or other considerations in order to protect resources. The spring snowmelt period (April-May) is the time when the potential for erosion impacts are greatest. The sale administrator will be responsible for ensuring that timber harvest activities will not degrade the soil and water resource¹.

1-8: Streamside management zone designation. The objective of Practice 1-8 is to designate a zone along riparian areas, streams and wetlands that will minimize potential for adverse effects from adjacent management activities. Field verifying all units for Riparian Reserves, excluding sensitive areas from proposed units and identifying those portions of Riparian Reserves where thinning activities could be accomplished without negatively impacting the soil and water resource, met the objectives of practice 1-8. Riparian Reserves occurring adjacent to units will be identified on sale area maps and the prescriptions for treating these Riparian Reserves will be included on the stand record cards.

1-9: Determining tractor loggable ground. The objective of Practice 1-9 is to minimize erosion and sedimentation resulting from ground disturbance of tractor logging systems. As a general guideline tractor logging should not occur on slopes greater than 35 percent. This objective was accomplished by ground verifying each unit for slope considerations during prescription development for the proposed action.

1-10: Tractor skidding design. The objective of Practice 1-10 is to design skidding patterns to best fit the terrain, the volume, velocity, concentration, and direction of runoff water in order to minimize erosion and sedimentation. As a general guideline the skid trail network cannot exceed 15% of the area in each treatment unit. The sale administrator will accomplish this practice by reviewing and approving by agreement the skid trail design as provided by the purchaser. No skid trails should be located within Riparian Reserves.

1-12: Log landing location. The objective of Practice 1-12 is to locate new landings in such a way as to avoid watershed impacts and associated water quality degradation. This objective will be accomplished by following guidelines for proper landing locations as described on page 35 of Water Quality Management for National Forest System Lands in California (2000). All landings will be either designated in advance or approved by the sale administrator by agreement based on the guidelines. No landings will be located within Riparian Reserves.

1-13: Erosion prevention and control measures during timber sale operations. The objective of Practice 1-13 is to ensure that the purchaser's operations will be conducted reasonably to minimize soil

¹ A limited operating period (LOP) is in effect for all portions of units located within ½ mile of nesting and roosting habitat for the Northern Goshawk. The LOP prohibits ground disturbing activities from February 1st through August 15th. In addition to benefiting wildlife the LOP will prevent timber harvest activities from occurring during spring snowmelt when soils are saturated, the ground is most sensitive to disturbance, and runoff is at its peak.

erosion. Drainage and erosion control work on temporary roads, skid trails, and permanent roads should be kept current during harvest activities. Equipment shall not be operated when ground conditions are such that excessive damage will result. The timber sale administrator will implement this practice through regular site visits and inspections.

1-16: Log landing erosion control. The objective of Practice 1-16 is to reduce the impacts of erosion and subsequent sedimentation associated with log landings by use of mitigating measures. The timber sale administrator will implement this practice through regular site visits and inspections. No landings will occur in Riparian Reserves in the Pilgrim Vegetation Management Project Area.

1-17: Erosion control on skid trails. The objective of Practice 1-17 is to protect water quality by minimizing erosion and sedimentation derived from skid trails. Skid trail erosion control work should be kept current during implementation. Erosion control and drainage of skid trails should be complete prior to shutting down operations due to wet weather. The timber sale administrator will implement this practice through regular site visits and inspections. No skid trails will occur within Riparian Reserves in the Pilgrim Vegetation Management Project Area.

1-19: Streamcourse and aquatic protection. The objective of Practice 1-19 is to control sediment and other pollutants entering streamcourses. Identifying all intermittent stream Riparian Reserves in the project area and excluding sensitive areas in Riparian Reserves from the proposed units meet the objectives of practice 1-19. A 20-foot skidding equipment exclusion zone extending from the inner gorge or channel bank is specified for units containing Riparian Reserves. Harvesting equipment will be allowed up to the bank and directional felling and minimizing turning of equipment will be required to minimize soil disturbance in the Riparian Reserves.

1-21: Acceptance of timber sale erosion control measures before sale closure. The objective of Practice 1-21 is to ensure adequacy of the required erosion control work on timber sales. The sale administrator will implement this practice. Prior to closure of the sale each unit will be inspected to ensure that skid trails and landings have water-bars in place and/or are properly drained.

Road and Building Site Construction BMPs _____

2-12: Servicing and refueling of equipment. The objective of Practice 2-12 is to prevent pollutants such as fuels, lubricants, bitumens and other harmful materials from being discharged into or near rivers, streams and impoundments, or into natural or man-made channels. Having the sale administrator designate the location, size and allowable uses of service and refueling areas will implement this practice. Due to the close proximity of the project area to McCloud it is not likely that any servicing or fueling areas will be required.

2-22: Maintenance of roads. The objective of Practice 2-22 is to maintain roads in a manner which provides for water quality protection by minimizing rutting, failures, sidecasting and blockage of drainage facilities all of which can cause erosion and sedimentation, and deteriorating watershed conditions. This practice will be accomplished by the purchaser, sale administrator and transportation planner.

2-23: Road surface treatment to prevent loss of materials. The objective of Practice 2-23 is to minimize the erosion of road surface materials and consequently reduce the likelihood of sediment production from those areas. This objective will be accomplished by watering roads for dust abatement during dry periods and spot rocking portions of roads that could be degraded as a result of winter hauling. The transportation planner and/or sale administrator will identify road reaches that need to be stormproofed.

2-24: Traffic control during wet periods. The objective of Practice 2-22 is to reduce road surface disturbance and rutting of roads and to minimize sediment washing from disturbed road surfaces. The sale administrator in conjunction with Practices 1-5, 1-13, 1-16 and 1-17 will implement traffic control during wet periods. A soil scientist or hydrologist will assist in the determination of the need for wet weather restrictions as requested by the sale administrator.

2-26: Obliteration or Decommissioning of Roads. The objective of Practice 2-26 is to reduce sediment generated from temporary roads, unneeded system (classified) and non-system (unclassified) roads by obliterating or decommissioning them at the completion of intended use. This practice will be implemented by specifying in the Timber Sale Contract that all temporary roads will be completely obliterated (ripped and blocked) following the completion of their intended use. Sale area improvement dollars may also be used to complete obliteration of temporary roads.

Vegetative Manipulation BMPs _____

5-2: Slope limitation for mechanical equipment operation. The objective of Practice 5-2 is to decrease sediment production and stream turbidity while mechanically treating slopes. As a general guideline, tractors should not be used on slopes exceeding 35 percent.

5-6: Soil moisture limitations for mechanical equipment operations. The objective of Practice 5-6 is to prevent compaction, rutting, and gulying, with resultant sediment production and turbidity. The sale administrator will implement this practice by notifying the unit soil scientist if ground conditions appear too wet for operations. The soil scientist will ground verify soil moisture conditions in order to determine if operations can proceed.

Fire Suppression and Fuels Management BMPs _____

6-1: Fire suppression and fuels management activities. The objective of Practice 6-1 is to reduce public and private losses and environmental impacts that result from wildfires and/or subsequent flooding and erosion by reducing or managing the frequency, intensity and extent of wildfire. Handpiling of all fuels within 50 feet of all Riparian Reserves is planned for the Pilgrim Vegetation Management Project.

6-2: Consideration of water quality in formulating fire prescriptions. The objective of Practice 6-2 is to provide for water quality protection while achieving the management objectives through the use of prescribed fire. Prescribed burn plans should consider potential water quality impacts that may arise as a result of increased erosion due to increased soil water repellency and loss of vegetative cover. This practice was implemented by incorporating soil and hydrologic input into the prescriptions for each unit during planning for the Pilgrim Vegetation Management Project.