

# **APPENDIX D**

## **BEST MANAGEMENT PRACTICES (BMPs)**



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BMP's and Timber Sale Contract "C" clauses will be included to insure minimal ground disturbance and to provide adequate mitigation. Effectiveness/implementation monitoring will be performed by TMA/resource personnel (the presale technician will assure BMPs are met during sale preparation and the sale administrator will assure BMPs are met during timber sale operations. Regional standards require that C clause C6.6# be included to prevent adverse cumulative soil impacts (<15%) and protect soils.

Specific resource protection measures and mitigation's listed below would be implemented in any action alternative. These resource protection measures and mitigation measures are consistent with Umatilla National Forest Land and Resource Management Plan (Forest Plan) standards and guidelines. The general discussion of Best Management Practices (BMP's) are found in the General Water Quality Best Management Practices, Pacific N.W. Region, 1988. BMP's and resource protection measures are identified below, as well as an estimation of the ability to implement BMPS's, their anticipated effectiveness, timing and responsibility for monitoring.

1. Follow PACFISH standards and guidelines. Timber Management, Roads Management, and Fire/Fuels Management standards and guides apply to this project.
2. Ephemeral stream channels should have protections to minimize equipment disturbance of duff and soil, and should not be used as skid trails, landing sites, or as road locations. Ephemeral draws, not within RHCAs, are to meet the following down wood requirements to reduce risk of upward migration and channel initiation: retain all wood embedded in the soil; retain at least 5 pieces of wood >12" diameter and >20' in length per 1000' of draw bottom (average 1 piece per 200'); retain at least 20 pieces of wood >6" diameter and >10' in length per 1000' of draw bottom (average 1 piece per 50'). Ephemeral draws with a gradient of 5% or more will need to be visited by the hydrologist to determine if any additional site specific mitigation is required.
3. All temporary roads and landings shall be obliterated at the completion of their intended use (see BMP R-23) - NFMA requires that all temporary roads be returned to resource production within 10 years. Reclose all roads, with sufficient drainage structures, which are opened for project activities. For all temporary roads:
  - obliterate as soon as feasible after use
  - season of use shall be specified to minimize rutting, erosion, sedimentation, and water concentrations
  - plan, locate, design, and construct temporary roads with ease of obliteration as a priority - stockpile topsoil and duff for re-shaping after use or obliteration
  - horizontal and vertical alignments should conform to the natural contour as closely as possible - outsloped rolls in the grade effectively break up water concentrations during use and can be crafted into silt traps and planting pockets during obliteration

4. The following BMP's are identified for the timber sale portion of the project, along with an estimation of the ability to implement them, as well as their anticipated effectiveness, timing and responsibility for monitoring.

T-1 - Timber Sale Planning Process

Estimates will be made on the potential changes to water quality and instream beneficial uses.

Responsibility: Hydrologist and Fisheries Biologist

Timing: Prior to activity

Ability to Implement: High

Effectiveness: High

T-2 - Timber Harvest Unit Design

Unit design will ensure favorable conditions of water flow, water quality, and fish habitat through PACFISH RHCAs.

Responsibility: Hydrologist and Fisheries Biologist

Timing: Prior to activity

Ability to Implement: High

Effectiveness: High

T-4 - Use of Sale Area Maps for Designating Water Quality Protection Needs

The Sale Area Map will include locations of streams to be protected and the required harvest method (ephemeral draws would be protected during forwarder route design, but not under the protected stream course provision).

Responsibility: Presale Technician

Timing: Prior to activity

Ability to Implement: High

Effectiveness: High

T-10 - Log Landing Location

Harvest plans will include proposed landing locations. Landing locations and size will be approved by the Forest Service in advance.

Responsibility: Presale Technician and Sale Administrator

Timing: Prior to and during activity

Ability to Implement: High

Effectiveness: High

T-11 - Yarding and Skidding Trail Location and Design

Harvest plans will include proposed yarding patterns. Trails will be approved in advance by Forest Service personnel.

Responsibility: Presale Technician and Sale Administrator

Timing: Prior to and during activity

Ability to Implement: High

Effectiveness: High

T-12 - Suspended Log Yarding in Timber Harvesting

Full suspension will occur where forwarder and helicopter logging is required and partial suspension will occur where skyline logging is required so as to create minimal soil disturbance.

Responsibility: Presale Technician and Sale Administrator

Timing: Prior to and during activity

Ability to Implement: High

Effectiveness: High

T-13 - Erosion Prevention Measures During Timber Sale Operations

Equipment shall not operate when ground conditions are susceptible to detrimental soil disturbances (not more than 15% of the logged area is permitted to have detrimental soil disturbance). Erosion control work will be kept current.

Responsibility: Sale Administrator

Timing: During activity

Ability to Implement: High

Effectiveness: High

T-15 - Log Landing Erosion Prevention and Control

The Forest Service will designate areas for landing scarification and erosion control seeding as well as any necessary water bars or other drainage structures.

Responsibility: Sale Administrator

Timing: During activity

Ability to Implement: High

Effectiveness: High

T-18 - Erosion Control Structure Maintenance

The Purchaser will provide maintenance of soil erosion control structures as required in the TSC.

Responsibility: Sale Administrator

Timing: During activity

Ability to Implement: Moderate

Effectiveness: High

T-19 - Acceptance of Timber Sale Erosion Control Measures Before Sale Closure

The effectiveness of erosion control measures will be evaluated periodically during the life of the sale.

Responsibility: Sale Administrator and Hydrologist

Timing: During activity

Ability to Implement: High

Effectiveness: High

T-20 - Reforestation

Suitable land will be reforested within five years of harvest.

Responsibility: Reforestation Technician

Timing: Prior to activity

Ability to Implement: High

Effectiveness: High

T-21 - Servicing and Refueling of Equipment

The Forest Service will designate refueling and servicing areas. A Spill Prevention Control and Countermeasures Plan is required if on site fuel storage exceeds 660 gallons in a single container or if total storage exceeds 1320 gallons.

Responsibility: Sale Administrator

Timing: During activity

Ability to Implement: High

Effectiveness: High

R-1 - General Guidelines for the Location and Design of Roads

Road reconstruction will assure design creates minimal resource damage.

Responsibility: Engineering Technician

Timing: Prior to activity

Ability to Implement: High

Effectiveness: High

R-2 - Erosion Control Plan

Limit erosion and sedimentation through effective planning and contract administration.

Responsibility: Engineering Technician

Timing: Prior to and during activity

Ability to Implement: High

Effectiveness: Moderate

R-3 - Timing of Construction Activities

Road reconstruction will occur during minimal runoff periods to minimize erosion

Responsibility: Engineering Technician

Timing: During activity

Ability to Implement: High

Effectiveness: Moderate

R-18 - Maintenance of Roads

Ditches and culverts will be kept open and ruts repaired.

Responsibility: Sale Administrator

Timing: During activity

Ability to Implement: High

Effectiveness: High

R-20 - Traffic Control During Wet Periods

Haul and other associated traffic will be controlled when road damage is likely to occur due to road/weather conditions.

Responsibility: Sale Administrator

Timing: During activity

Ability to Implement: High

Effectiveness: High

R-21 - Snow Removal Controls to Avoid Resource Damage

Snow removal will assure water can drain from road prism before it develops enough energy to erode road surface or fill slopes.

Responsibility: Sale Administrator

Timing: During activity

Ability to Implement: High

Effectiveness: High

R-22 - Restoration of Borrow Pits and Quarries

Borrow Pits will be stabilized such that banks are stable and access road provides necessary drainage.

Responsibility: Engineering Technician

Timing: During activity

Ability to Implement: High

Effectiveness: High

#### R-23 - Obliteration of temporary roads and landings

Temporary roads and landings will be obliterated at the completion of their intended use to reduce chronic sediment sources and restore productivity. Effective obliteration is generally achieved through a combination of the following measures: temporary culverts and bridges removed and natural drainage configuration reestablished, road surface ripped, sideslopes reshaped and stabilized, road effectively drained and blocked, road returned to resource production through revegetation (grass, browse, or trees).

Responsibility: Sale Administrator, with advice from hydrologist

Timing: At the completion of activity

Ability to Implement: High

Effectiveness: High

#### F-1 - Fire and Fuel Management Activities

Activity related fuel will be managed to assure the risk of wildfire is not increased. The timber sale contract will be utilized to ensure that LRMP standards and guidelines for down woody material are met without necessitating additional impacts due to use of machinery. Some slash should be retained on the forwarder trails to reduce the chances of erosion, to trap sediment, and to provide nutrients to the soils for productivity.

Responsibility: Fire Management Officer

Timing: During activity

Ability to Implement: High

Effectiveness: High

#### F-2 - Consideration of Water Quality in Formulating Prescribed Fire Prescriptions

The prescribed fire plan will be developed to assure fire mortality does not exceed 10% of the tree canopy or remove effective ground cover from more than 20% of the burn area. Fire ignitions will not occur within RHCAs.

Responsibility: Fire Management Officer

Timing: Prior to activity

Ability to Implement: High

Effectiveness: High

#### F-3 - Protection of Water Quality During Prescribed Fire Operations

The prescribed fire will follow the burn plan. Adjustments will be made during firing operations if objectives are not being met.

Responsibility: Fire Management Officer

Timing: Prior to and during activity

Ability to Implement: High

Effectiveness: High

#### W-5 - Cumulative Watershed Effects

To ensure that the additional effects of the proposed management activities, when added to the existing conditions, do not exceed thresholds of concern or result in adverse (degraded) water quality or channel/fish habitat conditions.

Responsibility: Hydrologist

Timing: Prior to activity

Ability to Implement: High

Effectiveness: High