Appendix 2

Management Requirements and Design Criteria

The measures identified in the following table serve to further reduce impacts to the specific resources identified. Most are considered design criteria and are included in all action alternatives.

Several abbreviations are used in the responsibility section of Table A2-1. The following explains those abbreviations:

DR	District Ranger	BT	Botanist
SA	Sale Administrator	TMC	Timber Marking Crew
SP	Sale Prep	NWM	Noxious Weed Manager
WB	Wildlife Biologist	LEO	Law Enforcement Officer
FMO	Fire Management Officer	IDT	Interdisciplinary Team Members
ENG	Engineer	ARCH	Archaeologist
SILV	Silviculturist	HYD	Hydrologist
DRC	District Road Coordinator	TP	Timber Sale Purchaser
RF	Resource Forester	RA	Range Administrator
FAFMO	Fuels Assistant Fire Management Officer	SS	Soils Scientist
FISH	Fisheries Biologist		

TABLE 2-1.
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
Grizzly Bear Security and SVGBCA Compliance	Comply with Swan Valley Grizzly Bear Conservation Agreement (SVGBCA). The Hemlock Elk Subunit is active from 2009 through 2011. Commercial use, defined as major forest management activities (including road construction and timber harvest), is not permitted in an Inactive subunit except during the denning period or during a short “window” in the summer. The Hemlock Elk Subunit is Inactive in 2008 and becomes Inactive again in 2012.	WB, SA, SP	Pre - & Post - Sale
Grizzly Bear Security	Comply with SVGBCA rotation schedule. Implementation (sale layout and preparation) of the Hemlock Elk Project is expected to begin in 2008. Harvest operations are expected to begin in 2009 and are anticipated to be completed within a 3-year time frame. If contract extensions result in sale activities extending beyond 3 years, into the time period when the grizzly bear subunit is Inactive, then standards and guidelines for an Inactive grizzly bear subunit will be followed (as per SVGBCA).	WB, SA, SP	Pre & Post - Sale

TABLE 2-1.
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
Grizzly Bear Security	In order to avoid the potential disturbance of grizzly bear in important Spring Habitat, management activities that are planned in Spring Habitat, which is defined as areas within designated Linkage Zones, below 5,200 feet, will not occur within the Spring Period (April 1 through June 15). This timing restriction would apply to the following treatment units: Units 1, 20, 21, 22, 23, 25, 27, and 28.	SP, SA, TMC, WB	Pre & Post - Sale
Grizzly Bear Security	Lay out Seed Tree Units and Clearcut with Reserve units so that no point in the unit is more than 600 feet from cover; in other words, a bear in the unit would be able to find cover, anywhere in the unit, within 600 feet or less.	SP, WB	Pre & Post - Sale
Wildlife Security	Where it exists, leave visual screening adjacent to open roads in proposed cutting units.	SP, SA, TMC, WB	Pre - & Post - Sale
Wildlife – TES Species	Include provisions in the contract to cease activity or otherwise protect populations and individuals of threatened, endangered, or sensitive species. This allows for modification of the project should an unforeseen issue(s) be identified during operations. Standard contractual requirements used in all contracts provide for modification or termination of the contract to avoid impacts and protect TES species.	WB, SA, SILV	Contract Prep & During Harvest Activities
Wildlife – T&E Species	Public motorized access would be restricted on temporary and forwarder roads and roads normally closed to use.	WB, SA, DRC	Pre - & Post - Sale & During Harvest Activities
Wildlife– T&E Species	Contractors working under contract would be prohibited from carrying firearms on normally closed roads within the Project Area on NFS lands, PCTC lands, or State lands (SVGBCA).	SA, LEO, WB	Pre & Post Sale, During Harvest
Wildlife – T&E Species	All temporary and forwarder roads constructed on NFS lands will be reclaimed after use.	SA, DRC, WB	Post Sale
Wildlife - Security	Vegetation and/or rock barriers will be retained around berms and gates, where needed, to maintain closure effectiveness.	DRC, SA, WB	Pre & Post - Sale, During Harvest Activities
Wildlife – Security	If berms are removed for access to treatment units, temporary gates will be installed. Berms will be reinstalled when sale activities are complete.	SB, SA, DRC	Pre & Post - Sale, During Harvest
Public Safety	Contracts will require the contractor to clearly post signs warning the public of nearby activities and truck hauling traffic associated with the treatments.	SA, DRM	Pre & Post - Sale, During Harvest Activities
Public Safety	The District Assistant Fire Management Officer (Fuels) or designated liaison will notify nearby landowners prior to fuel reduction activities commencing on NFS lands that are adjacent to their properties.	FAFMO	Pre - Sale, During Harvest Activities
Special Use Permits	All permitted improvements, including power and phone service lines and water transmission lines (authorized by special use permits) will be clearly marked and protected during project implementation.	SA, TMC, IF, FMO, SP, RF	Pre & Post - Sale
Protect Site and Soil Productivity	Reuse existing skid trails where practical. Carefully select trails for the least environmental degradation and optimal efficiency.	SA, SP, SS	Pre & Post - Sale, During Harvest Activities

TABLE 2-1.
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
Protect Site and Soil Productivity	Select appropriate logging contractors for the task at hand. Invest some time instructing contractors new to light-on-the land and soil restoration techniques.	SA, SP, SS	During Harvest Activities
Protect Site and Soil Productivity	Limit ground-based equipment to slopes of 35 percent or less. Yarding and forwarding on short pitches (maximum 100 feet) over 35 percent slope is allowed; however, ground-based equipment should cable yard accessible steep slopes.	SA, SP, SS	During Harvest Activities
Protect Site and Soil Productivity	Use cable harvesting systems on steep slopes (greater than 35 percent). Maintain corridors as far apart as feasible. Cable systems are highly effective when employed correctly. Specifically, this system drastically reduces compaction and soil displacement.	SA, SP, SS	During Harvest Activities
Protect Site and Soil Productivity	Skidder/forwarder trails should be no fewer than **100 feet** apart except where converging at junctions or landings. Maintain narrow trails.	SA, SP, SS	Pre & Post - Sale, During Harvest Activities
Protect Site and Soil Productivity	Leave as much slash as is feasible under fuel hazard guidelines. Organic matter will ameliorate past and present soil impacts. Where feasible, an average of 8 tons per acre of coarse woody debris would be left on treatment units within the WUI; 8 to 21 tons per acres of coarse woody debris would be left in treatment units outside the WUI.	SA, SP, SS	During Harvest Activities
Protect Site and Soil Productivity	All equipment should stay on designated skid routes, or as designated by the Sale Administrator, with the exception of feller-bunchers and harvesters.	SA, SP, SS	Pre & Post - Sale, During Harvest Activities
Protect Site and Soil Productivity	Minimize harvester trips off main trails to three passes.	SA, SP, SS	Pre & Post - Sale, During Harvest Activities
Protect Site and Soil Productivity	Where feasible, timber harvesters should place slash in front of the vehicle and work on a slash mat.	SA, SP, SS	During Harvest Activities
Protect Site and Soil Productivity	Work only when soil is dry, frozen, or snow-packed. Stop work when trenching or mud is detected. If a fairly strong clod can be formed with the soil in the topmost 6 inches, then the site is too moist for work. For snow or frozen soil: 0 inches of frozen soil – need 10 inches of machine packed snow; 2 inches of frozen soil – need 6 inches of machine packed snow; 4 inches of frozen soil – no snow cover necessary.	SA, SP, SS	During Harvest Activities
Protect Site and Soil Productivity	If necessary, pre-pack snow on designated routes before work commences. This allows soil to freeze and the snow to solidify.	SA, SP, SS	Pre & Post - Sale, During Harvest Activities

TABLE 2-1.
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
Protect Site and Soil Productivity	In regeneration harvest units, for biomass removal, leave green slash on the forest floor for at least one wet season to allow nutrients to leach out of the foliage and into the soil. Leave the appropriate amount of coarse woody debris. A forwarder will be required in regeneration harvest units.	SA, SP, SS	Post – Sale During Harvest Activities
Protect Site and Soil Productivity	All temporary and forwarder roads constructed for this project that utilize existing road templates would be reclaimed by removing any installed culverts or temporary bridges, by placing large woody material on the template (where material is available), and by seeding exposed soils with the native plant mix as specified by the Forest Botanist. In addition, all newly constructed temporary and forwarder roads would be reclaimed after use, as soon as logistically practicable. The reclaiming of new temporary and forwarder roads would include re-contouring the entire road template to natural ground contour, and to the extent feasible, placing the top soil back on the soil surface.	SA, SS	During Harvest Activities, Post-Sale
Water Quality	All drainage features will be put in place and functioning before, during, and after activities.	HYD, SA, SP, DRM	Pre - & Post - Harvest, During Harvest Activities
Water Quality	If activities carry over into another operating season or are delayed because of incumbent weather, all "jump ups""or other temporary transportation features would be cleared from roadside ditches to prevent damage to the roads.	HYD, SA, SP, DRM	Pre - & Post - Harvest, During Harvest Activities
Water Quality	All activities will meet Montana Best Management Practices and the State Streamside Management Zone Law, and, therefore, will comply with State Water Quality Laws and Federal Soil and Water Quality Handbook.	HYD, SA, SP	Pre - & Post - Harvest, During Harvest Activities
Protect Fisheries Habitat	No vegetation management would be conducted within INFISH Riparian Habitat Conservation Areas (RHCA's) except as specifically designed within Unit 1 (See Fisheries Report). No activity would occur within 300 feet of any fish-bearing stream, or 150 feet of any perennial non-fish bearing stream, or 100 feet from any intermittent stream in Glacier Creek. Designate the following RHCA buffers for treatment units: Unit 3a - 100 feet from small Cold Creek tributary and wetland on eastern edge Unit 5b - On both east and west sides – 150 feet from all wetlands and 100 feet from streams that connect the wetlands; no stream upstream (south) of the eastern wetland, no buffer needed there, (i.e., southeast corner of unit needs no buffer) Unit 9 - 100 feet from tributary on south border Unit 10 - 100 feet from each tributary on north border and center of unit and west border Unit 17 - 300 feet from Elk Creek; 150 feet from wetland near sharp turn on Road 9587 and 100 feet from wetland just north of that	SA, SP, FMO, FAFMO, FISH	Pre - & Post - Harvest, During Harvest Activities

TABLE 2-1.
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
	Unit 20 - 300 feet from Elk Creek; three wetlands on eastern edge need 150 feet; small wetland at extreme SW corner needs 100 feet Unit 21 - 300 feet from Elk Creek; 150 feet from tributary along SW edge; 100 feet from wetland at confluence of Units 21, 22, and 23 Unit 22 - 100 feet from wetland of confluence of Units 21, 22, 23 Unit 23 - 300 feet from Elk Creek; 150 feet from all the wetlands and lakes within or near the unit except the following two: a 300-foot buffer is needed for both wetlands right beside each other in SE corner of Section 16; a 100-foot buffer is needed for small wetland in center of unit Unit 25 - 300 feet from Windfall Creek; 150 feet from tributary stream along NE edge of unit; 150 feet from all wetlands in a string on SE edge of unit Unit 27 - 150 feet from wetlands on eastern border		
Protect Fisheries Habitat	In Unit 1, no harvest will be allowed within 150 feet of the stream or the top of the topographic break, whichever is greater. No mechanized equipment will be allowed between a 300 foot setback and the 150 foot topographic break. Yarding of trees will occur with a ground lead system between the 300 foot setback and the 150 foot topographic break. A 50 foot no treatment buffer will occur along an intermittent stream in the northern portion of the unit. Tractor harvest will occur in the remainder of the unit.	SA, SP, FMO, FAFMO, FISH	Pre - & Post - Harvest, During Harvest Activities
Protect Groundwater Quality	No activity within 50 feet of any wetland less than 1 acre or 150 feet of any wetland greater than 1 acre would be conducted.	SA, SP, FMO, FAFMO, FISH	Pre - & Post - Harvest, During Harvest Activities
Protect Fisheries Resource	The following treatment units require NO RHCA buffer: Units 11, 12, 13, 15, and 28.	SA, SP, FMO, FAFMO, FISH	Pre - & Post - Harvest, During Harvest Activities
Minimize Sedimentation	During removal of old bridge abutments on Cold Creek and Kraft Creek, heavy equipment would be restricted to just one crossing of the stream. Wash the equipment prior to implementation to minimize sediments entering the channel.	FISH, HYD	During Implementation
Minimize Disturbance to Bull Trout	During all culvert replacements/removals and the bridge abutment removal in Cold Creek Watershed, restrict activity to a period between July 15 and August 31. No activity would take place at night.	ENG, FISH	During Implementation
Forest Vegetation	Prepare detailed site specific silvicultural prescription for all treatment areas requiring vegetation manipulation.	SILV	Prior to presale activities
Forest Vegetation	Consult with Project Silviculturist where treatment deviations are required during contract execution, as a result of changed or unidentified conditions that materially affect the intended treatment as described in the	SILV, TSA, SP, FMO	Pre, During, and Post Harvest Activities

TABLE 2-1.
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
	detailed site specific silvicultural prescription. As needed, the silvicultural prescription will be modified and re-approved by a Certified Silviculturist.		
Forest Vegetation (Leave Tree Protection)	Contractor will take all reasonable care to avoid damage to the roots, bole, and crown of trees to be reserved from cutting. No more than 5 percent of the trees designated to be reserved should be damaged beyond recovery by the Contractor's operations. Any tree damaged beyond recovery, (will die within 1 year due to damage), can be removed or otherwise treated by the Contractor as instructed by the Forest Service.	TP, TSA, SILV	Pre, During, and Post Harvest Activities
Forest Vegetation (Leave Tree Protection)	All hardwood trees will be reserved where feasible.	SILV, SA, TP, SP	Pre, During, and Post-harvest Activities
Forest Vegetation (Leave Tree Protection)	In Unit 11, Seed Tree with Reserves at least 15 to 20 trees per acre will be retained.	SILV, SA, TP, SP	Pre, During, and Post-harvest Activities
Forest Vegetation (Down Woody Material)	In treatment units, the minimum retention for down woody material shall be consistent with Forest Plan direction as outlined by potential vegetation groups where available and will be averaged across unit acres. An average of 8 tons per acre of coarse woody debris would be left on treatment units within the WUI; 8 to 21 tons per acres of coarse woody debris would be left in treatment units outside the WUI. Where available, 32 pieces average per acre 9 to 20-inches diameter and 15 pieces average per acre greater than 20-inches diameter would be left. This amount of down woody material can be converted to tons per acre. Generally, down woody material to be left would be further than 150 feet from private land boundaries.	SILV, SA, TP, SP	Pre, During, and Post Harvest Activities
Forest Vegetation (Snag Retention)	In treatment units, where available, a minimum average of 6 snags per acre that are 12 to 20 inches DBH would be left and all snags greater than 20 inches would be left. If existing snag densities are below these densities, substitute live trees would be left. All standing dead cull western larch, ponderosa pine, and Douglas-fir trees 16 inches DBH or greater may be retained. Generally, snags to be left would be further than 150 feet from open roads and private land boundaries. Snags that pose a safety hazard to the Contractor's operation would be removed.	SILV, SA, TP, SP	Pre, During, and Post Harvest Activities
Preserve TES Plant Populations and Their Habitats	Sensitive plant surveys were partially completed during the 2007 field season. If new occurrences of sensitive or threatened plant species are discovered during activities or surveys conducted prior to ground disturbance, contractual requirements provide for modification of the contract to avoid impacts and protect their habitat. Special treatment zones would be created or unit boundaries would be relocated to avoid negative impacts. Avoid disturbance of sensitive plant populations observed during sale activities through cooperation between Sale Administrators and loggers. Any sensitive plant species observed during sale activity would be given protective measures as afforded by standard contract clause CT6251.	BT, SA, SP, FMO	Pre- & Post Sale & during Harvest Activities

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MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
Preserve TES Plant Populations and Their Habitats	Comply with Forest Plan Amendment 20 (Conservation Measures for the Threatened Plant, Water Howellia) and the Conservation Strategy for *Howellia aquatilis*. If wet areas are identified as "occupied howellia habitat" within treatment units, establish a 300-foot buffer around occupied howellia ponds where no ground disturbance would occur, regardless of activity. The 300-foot buffer begins where riparian vegetation ends.	SA, BT	Pre - & Post Sale & During Harvest Activities
Preserve TES Plant Populations and Their Habitats	Establish a 150-foot buffer zone for potentially unoccupied howellia ponds, where no ground disturbance would occur. If sensitive or threatened plant species are discovered during activities, steps would be taken to minimize impact and protect their habitat.	SA, BT	Pre - & Post Sale & During Harvest Activities
Preserve TES Plant Populations and Their Habitats	Protect occupied howellia ponds 54, 55, 119, and 120 located near haul routes, Roads #561, and 9553. If ground disturbing BMP-related activities occur within 300 feet to the north and south of these ponds, natural filtration zones, sediment retention structures, or straw bales would be applied to ensure limited sediment deposition into these ponds. See Project File Exhibit H-2 for specific locations of ponds.	SP, SA, BT	Pre - & Post Sale & During Harvest Activities
Preserve TES Plant Populations and Their Habitats	Protect unoccupied howellia ponds u-021, u-022, u-049, and u-097 located near haul routes, Roads #9553, 9591, 10257, and 10289. If ground-disturbing BMP activities occur in the vicinity of these ponds, natural filtration zones, sediment retention structures, or straw bales would be applied to ensure limited sediment deposition into these ponds. See Project File Exhibit H-1 for specific locations of ponds.	SP, SA, BT	Pre - & Post Sale & During Harvest Activities
Protect Aspen Clones	Protect aspen clones associated with wetlands in Units 11 and 12 from ground disturbance and noxious weeds. No ground disturbance would occur within 50 feet of wetlands less than 1 acre, and 150 feet for wetlands more than 1 acre. See Resource Enhancement Project description for vegetation management that may occur in these clones.	SA, BT	Pre - & Post Sale & During Harvest Activities
Control Spread of Noxious Weeds	Re-establish vegetation on bare ground created at log landings and roadsides with soil disturbance with a Montana-Certified weed free grass ground cover (seed mix of native plants will be specified by the Forest Botanist), as soon as feasible after disturbance to provide for site protection until native species are established.	SA, BT, DRC	Post - Sale
Control Spread of Noxious Weeds	Off-road equipment use associated with timber harvest and road maintenance would be power scrubbed or steam cleaned on the undercarriage and chassis to remove all soil, plant parts, seeds, vegetative matter, or other debris that could contain or hold seeds before transport to and from the project area. All subsequent move-ins of equipment to the project area would be treated in the same manner as the initial move in. "Off-road equipment" includes all logging and construction machinery, except for log trucks, chip vans, service vehicles, water trucks, pickup trucks, cars, and similar vehicles. During periods of operations with snow cover or frozen ground, washing of equipment as described above is only required upon entering the project area, but not when leaving.	SA, TP	Pre-Harvest
Control Spread of Noxious Weeds	Obliteration and revegetation of new temporary and forwarder roads would occur to discourage future access and create a vegetation community that would resist infestations. When use of the temporary or forwarder road is no longer needed for the project, soil would be pulled back over the road template, recontouring the road prism including all cut and fill slopes to the natural ground contour to the extent feasible. Revegetate with native shrubs or native seed mix (specified by the Forest Botanist) as soon as	SA, TP	Pre - & Post Sale & During Harvest Activities

TABLE 2-1.
MANAGEMENT REQUIREMENTS AND DESIGN CRITERIA

OBJECTIVE	TASK	RESPONSIBILITY	DUE DATE
	feasible after disturbance to provide for site protection until native species are established. The first 100 feet where the temporary and forwarder road meets a traveled road should have heavier placement of slash and large woody debris when practical where these roads meet a road open to public motorized use to discourage the spread of weeds by unauthorized entry. Roads would be obliterated as soon as access is no longer needed.		
Control Spread of Noxious Weeds	Herbicides would be sprayed within the road prism along designated haul routes (Project File Exhibit P-1) before log hauling begins and after all purchaser activities are completed. The road prism is defined as the road and associated toe of the fill to the top of the cut slope, including the running surface and turnouts. However, when a contiguous patch of weeds extends beyond the road prism, it shall be treated (via force account or other means). Treatments would only occur during the periods from June 1 to July 15 or September 1 to September 30. Treatment of invasive plants would be consistent with the strategy outlined in the NIWC and FONSI (May 2001). Specific roads and mileage would be prepared in consultation with the Forest Weeds Coordinator.	SA, NWM	Pre - & Post - Sale
Protect Heritage Resources	Modify contractual requirements to provide for protection of heritage resources and modify the contract to avoid impacts to heritage resource if cultural resources are discovered during ground disturbing activities.	SA, ARCH, SP	Pre & Post Sale, During Harvest Activities
Protect Old Foothills Trail	The Foothills Trail occurring in Units 22 and 23 will not be used as a forwarder trail. Slash will not be placed on it. Forwarder crossing will be designated by the Sale Administrator.	SA	Pre & Post Sale, During Harvest Activities
Preserve Scenic Values	Unit boundaries would be designed so they undulate and/or feather; straight lines are minimized or non-existent.	SA, SILV, TMC	Pre & Post Sale, During Harvest Activities
Preserve Scenic Values	Units would be designed to blend with the characteristic landscape.	SA, SILV, TMC	Pre & Post Sale, During Harvest Activities