

Appendix B-1: Project Design Criteria

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Project Design Criteria (By Resource Area)	Description of Project Design Criteria
Fuels	
FU-1	Use of prescribed fire is a “gradual” re-introduction of fire into the ecosystem. During this initial phase, it should be considered in 2 stages, i.e. at 2 different times with 2 different burning prescriptions.
FU-2	Need adequate clearance of fuels around residual trees prior to prescribed burning. This can occur during the time of thinning treatment through directional falling or some pull-back/scattering by the person doing the thinning, or a different crew that comes in after the thinning treatment can do it.
FU-3	Soil moisture at 15-20% at the time of prescribed burning in order not to consume all the duff and/or microorganisms in the soil.
FU-4	If fuel loading is too heavy following the thinning treatments for prescribed fire use within acceptable mortality objectives, consider some concentration piling with low-ground pressure equipment such as a grapple/excavator. Mechanical piling by this means also significantly lessens damage to residual trees. In addition, partially decomposed woody material can easily be left on the site and not be included in piles for burning.
FU-5	For a natural landscape appearance and for long-term soil productivity leave partially decomposed woody material and solid larger size bolewood on-site as specified by the BLM Resource Management Plan or South Dakota Best Management Practices.
FU-6	Leave an occasional “cluster” of pine trees, to help maintain some diversity and develop a mosaic pattern across the landscape. A cluster is defined as 3-5 larger size diameter dominant/co-dominate, ponderosa pine trees, within a 12-15 foot radius. An average of one every 50 – 75 feet can be used as a guideline. In most mid-age pine stands assessed in this project area, “clusters” are present throughout.
FU-7	Leave occasional small “patches” of regeneration. Patches are anticipated not to be more than ¼ - ½ acre in size, spaced on an average of 100 yards throughout a mid to older age Ponderosa pine stand.
FU-8	For a natural landscape appearance leave a minimum number (2-5 per acre) of existing snags that are 10-inch diameter and greater.
Silviculture	
SV-1	Slash-creating activities should be limited to July through December. Slash created during this time period is likely to dry sufficiently by spring to be unsuitable <i>lps</i> habitat. Creation of green slash between January and June should be minimized or prohibited.
SV-2	An alternative to this method is the creation of very large slash piles in the spring before initial beetle flight. If piles are big enough so that interior pieces do not dry before beetles from the initial generation emerge, new beetles are attracted deeper into the pile, keeping them out of standing trees. Piles should be about 20 feet wide and 10 feet deep, and distributed throughout the treated area.
SV-3	Leave pockets of trees where spruce is the dominant overstory tree (up to 5 acres)

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Mine Hazards	
MHAZ-1	<ol style="list-style-type: none"> 1. Do not enter any mine adits or openings. 2. Keep heavy equipment away from the vicinity of mine openings and areas that show signs of subsidence 3. Keep people and equipment off of any barren or poorly vegetated areas downslope from mine openings.
Watershed/Soils	
WS-1	All applicable South Dakota Best Management Practices for timber projects and road use will be adopted.
WS-2	Within the burned WUI treatment areas, Leave 15 – 20 tons per/acre of Coarse Woody Debris (CWD) (woody organic material which is 3 inches in diameter and greater) In all other areas leave 10 – 15 tons/acre. Approximately half of that amount (where available) should be in a large size class (12 inches diameter and 8 feet long minimum to count for a large piece).
WS-3	Leave 50-foot stream buffers on all channels that have a bed or bank. Thinning activities on trees which do not influence streambank stability would be allowed within this zone, but ground disturbing yarding activities would not be permitted, i.e. full suspension yarding of logs could be applied, but end-lining logs without suspension would not be allowed.
WS-4	<u>Tractor Skidding Location and Design</u> The location of skidtrails in the treatment areas will be located and/or approved by the project manager. Equipment restrictions will be observed for designated features. This will effectively keep skid trails out of ephemeral drainage bottoms, riparian, or wet areas.
WS-5	<u>Log Landing Location and Design</u> It is important to locate landings so as to prevent deleterious watershed conditions. The location of the clearing limits for all landings must be agreed upon by the implementing parties prior to construction. The following criteria will be used to evaluate landing location and design: <ol style="list-style-type: none"> 1. Cleared or excavated site shall be no larger than needed for safety 2. Where a choice exists, sites are selected for the least amount of excavation and erosion potential. 3. If possible, landings are located near the points of ridges to concentrate skidding away from channels and streamside zones. Landings will be located at least 150 feet away from designated watershed features, unless assessed individually by the appropriate specialists. 4. Landings are located where the least number of skid roads are needed and side cast won't enter drainages or other sensitive watershed areas. 5. Where practical, landings are positioned for level skid road approach. 6. There will be no more than four skid roads entering a landing. 7. Landings will be shaped to drain in a planned direction and manner to minimize erosion and sediment delivery to watercourses. 8. Erosion control measures will be implemented during and after use of the landing.

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WS-6	<p><u>Log Landing Erosion Prevention and Control</u> Landings associated with the timber treatment units will be ditched and/or sloped to permit drainage and dispersion of water during and after use. Provisions also should be made for revegetation. This may include seeding, and where needed, mulching landings after use. The seed mix should be a sterile annual type, which will die out as local native vegetation replaces it. Other seed may be used if coordinated with the appropriate BLM resource specialists. Provisions will also be used to slope and remove overhangs on cut and fill banks around landings. Provisions to scarify, construct drainage ditches, and prevention of water running off roads from reaching a landing will be used on a site-specific basis depending on actual ground conditions. No landings will be allowed in critical watershed or soil areas, riparian or springs areas, or protected watercourses. The specific work needed on each landing depends on the actual on the ground conditions at the time. The provisions will be written into any implementation documents. The location and size of landings must be agreed upon prior to clearing and construction.</p> <p>Restoration activities will include: All skid road water bars in the vicinity of the landing will be drained so that water will not enter the landing. Banks (cut and fill) surrounding the landings will be sloped, overhangs removed, seeded with specified seeds, and mulched where needed. Any temporary roads including skid roads leading to landings will be water barred into stable areas so that drainage will not go onto landings.</p>
WS-7	<p><u>Erosion Prevention and Control Measures During Timber Treatment Operations</u> Erosion control work will be kept current preceding expected seasonal periods of precipitation and/or runoff. Erosion control consists of waterbars, drainage ditches, silt fence, and other practices where determined needed by the project manager to prevent erosion and soil loss.</p>
WS-8	<p><u>Erosion Control on Skid Trails</u> Construct waterbars on skid trails soon (within 2 days) after use of a any skid trail is no longer needed. Waterbars should be constructed only as large as necessary to divert water off of the skid trail. Water bars should be inspected soon after rainfall events to ensure proper function and remedial actions should be taken on those structures that have failed or are not working. After activities have stopped, the skid trails would be decompacted where needed and seeded.</p>
WS-9	<p><u>Timing of Construction Activities</u> Equipment will not be allowed to operate when ground conditions are such that damage will result. The project manager and/or appropriate specialist identify these conditions. The following guidelines will be used:</p> <ol style="list-style-type: none"> 1. Erosion control work will be kept current throughout the implementation period. 2. Construction of road drainage and other erosion control measures will be carried out as soon as possible. 3. Operator will limit the amount of area being disturbed at a site at any one time and will minimize the time an area is laid bare.

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<p>WS-10</p>	<p><u>Surface Erosion Control and Stabilization of Slopes</u> Vegetative material from clearing can be placed on top of the toe of fill slopes and/or piled on the downhill side of the right-of-way, but not incorporated into the fill. Clearing should be done immediately in advance of construction. If excavation is done first or in conjunction, slash often becomes mixed with soil and contributes sediment rather than filtering it. Drainage structures such as waterbars and culverts would be cleaned, rebuilt, or placed as needed on the treatment areas as road reconstruction progresses. They would be spaced to conform to the natural drains in the topography. Any watercourse that could foreseeably carry water would have some sort of drainage structure on it. This would vary from a culvert, ford, cross drain, or dip in the road depending on the site characteristics. In addition to controlling water in the natural drains, water from precipitation falling and running off on the road surface must be directed so that erosion would not result. This would be accomplished with improved road surfacing, road sloping, and cross drains.</p> <p>Due to surface erosion on road fill and cut slopes, it is necessary to have slope stabilization work completed by the first winter season when erosion potential is most severe. This would be accomplished using revegetation, mulches, and filter windrows on the timber treatment areas should an action alternative be selected. If needed, fill and cut slopes would be stabilized.</p>
<p>WS-11</p>	<p><u>Control of Sidecast Material</u> Do not sidecast road surface materials from the road. Preserve roadside vegetation in ditches, cutbanks, and fillslopes to help stabilize road materials.</p>
<p>WS-12</p>	<p><u>Servicing and Refueling of Equipment</u> The project manager will designate refueling locations within the project activity areas. These sites will be located well away (150 feet or more) from any stream courses or spring. A containment structure such as a berm will be constructed around any large (500 gallons or more) refueling sites. A spill plan should be onsite that outlines the actions needed to be taken in the event of a spill.</p>
<p>WS-13</p>	<p><u>Maintenance of Roads: <i>Project Activities:</i></u></p> <ol style="list-style-type: none"> 1) Removal of road debris, fallen timber, boulders, and overhanging brush that obstructs safe sight distance. Brush removal would be done in such a manner that would preserve the vitality of roadside vegetation. Debris would be disposed of in approved locations. 2) Blading and shaping of the road surface and ditches to maintain the original cross sections. Banks would not be undercut. Gravel or other road surfacing material would not be bladed off the road surface. Mud and other debris would not be incorporated into the road surfacing material. 3) Ditches, culverts, and other drainage features would be kept clear of earth, slash, and other debris to maintain their efficient functioning during and immediately after periods of road use. 4) Road fills that wash or settle would be corrected quickly to prevent additional erosion and road damage. No earth, rocks, or other debris would be deposited upon roadside slope stabilization structures or features. 5) If needed, snow would be removed during operations by plowing it from the roadway so the road surface, road drainage, and adjacent resources are protected. 6) Preventative maintenance would be performed before and during seasonal periods of precipitation and/or runoff and before acceptance. This would include waterbarring, insloping, outsloping, and closing roads.

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WS-14	<p><u>Road Surface Treatment to Prevent Loss of Materials</u> Erosion from road surfaces as a result of runoff and use would be addressed by grading the road as often as necessary to retain the original road surface drainage during timber operations. During wet periods, the road surface would be carefully watched and the road closed if necessary to avoid undue damage. During dry weather, road surface treatment would be needed to prevent dust from entering the air and adjacent water and lands. Water would be applied to the road surface by water trucks as often as necessary.</p>
WS-15	<p><u>Snow Removal Controls to Avoid Resource Damage</u></p> <ol style="list-style-type: none"> 1. During snow removal operations, banks would not be undercut. Gravel or other road surface material would not be bladed off the roadway surface. 2. Ditches, culverts, waterbars, and other drainage structures would be kept functional during and following roadway use. 3. Snow berms would be managed to avoid accumulation or channelization of melt water on roads, fill slopes, and bare soils. At the end of winter operations, these berms would be removed and/or drainage holes created before the end of operations. 4. Snow would not be accumulated in piles on slopes greater than 10 percent or above critical watershed areas identified in the specialist's report..
WS-16	To minimize soil disturbance and compaction, existing landings and skidtrails would be used whenever possible. All landings, skidtrails, and roads must be approved before felling operations begin. Skidtrail patterns, landing locations, and temporary roads will be planned to access the area with the least amount of soil or residual tree disturbance. Soil displacement will be monitored during ground-based logging and machine slash disposal operations.
WS-17	On slopes greater than 15 percent, skidtrails should run up and down the slope. Excavated skidtrails will not be permitted.
WS-18	Skidtrails will average at least 125 feet apart and will be no more than 14 feet wide.
WS-19	Landing size will be kept to 1/4 to 1/3 acre when possible. Safety and the amount of logging slash accumulated at the landings will determine size.
WS-20	Machinery will be no larger than is necessary to complete the goals of the project prescription.
WS-21	Landings, temporary roads, and skidtrails will not be located in wet areas or draws, basins, and etc., where water concentrates. Existing landing, temporary roads, and trails in these areas will not be used without consulting the administrative office.
WS-22	Trees will be directional felled to lead to the skidtrails.
Wildlife	
WL-1	A 100' no-activity protection buffer around open mine shafts or cave entrances to protect potential habitat for Townsend's big-eared bat.
WL-2	Leave 5-acre blocks untreated and scattered throughout the Grizzly Fire burned area WUI's (10% of the treatment areas in Deadwood South, Peedee Gulch, and Grizzly Gulch WUI's). This would provide habitat in the treatment units for two species of woodpeckers designated as sensitive.
WL-3	All slash piles that remain after April 1 will be left until the next burning period to provide potential wild turkey nesting habitat.
Lands	
LA-1	If treatments are within an authorized tight of way, coordinate the treatment activity with the right of way holder
LA-2	If work is being done where a right of way user could be in danger, the use of signs or flags will be used to assure the safety of right of way users.

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Project Design Criteria (By Resource Area)	Description of Project Design Criteria
LA -3	Implement dust abatement procedures where project treatments would create a dust problem for the right of way users.
Archeology	
AR-1	<p>All activity fuels will be piled outside the perimeter of all heritage sites. No mechanized equipment will be allowed to operate within the heritage site boundaries unless specifically allowed by the prescribed site treatment.</p> <p>For the six newly recorded sites and the seven previously recorded sites that may be or are eligible to the National Register of Historic Places, there will be a 100 foot buffer flagged around the currently know site extent. A qualified archaeologist will flag this boundary. Site-specific treatments for this project will be written by the Bureau of Land Management Archaeologist to avoid any actions that will disturb these sites. A qualified archaeologist will monitor any activities that may disturb Heritage Resources.</p>
AR-2	<p>Implementation crews will be informed of the presents and likelihood of encountering archaeological and historical resources by a qualified archaeologist before work begins.</p> <p>Thinning crews should inspect each location for any evidence of historic or prehistoric cultural activity, including structures, mines, aspen art, historic graffiti and blazes, cultural peeling, wickiups, and tree scaffolds, prior to cutting, and avoid taking action at any location that has any indication of historic or prehistoric cultural modification. Some archaeological sites may not be recognized by non-archaeologists, but those site types are less likely to be impacted by these minor actions.</p>
AR-3	The BLM Archaeologist will be contacted immediately if any Historic Resources are identified during implementation. Any Historic Resources located during the implementation will be avoided until assessment and evaluation can occur. Further consultation with SD SHPO may be necessary.
AR-4	<p>All persons associated with operations under this authorization must be informed that any objects or sites of cultural, paleontological, or scientific value such as historic or prehistoric resources, graves or grave markers, human remains, ruins, cabins, rock art, fossils, or artifacts shall not be damaged, destroyed, removed, moved, or disturbed. If in connection with operations under this authorization any of the above resources are encountered, the proponent shall immediately suspend all activities in the immediate vicinity of the discovery that might further disturb such materials and notify the Bureau of Land Management authorized officer of the findings. The discovery must be protected until notified in writing to proceed by the authorized officer (36 CFR 800.110 & 112, 43 CFR 10.4).</p> <p>Actions need only be stopped in the general vicinity of the heritage resource find. Actions may continue elsewhere in the project area.</p>
Noxious Weeds	
NX-1	Noxious weed populations will be controlled through aggressive treatments using Integrated Pest Management practices when found.
NX-2	All off-road commercial harvest and road building equipment will be cleaned (washed) prior to coming on to the project area.
NX-3	Seed, straw, and other materials for rehabilitation will be certified noxious weed free.

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Project Design Criteria (By Resource Area)	Description of Project Design Criteria
NX-4	All disturbed soils resulting from ground-based yarding, skid-trails, temporary roads, and road maintenance or road reconstruction will be seeded with an approved noxious weed-free grass mix.
Visual Resource	
VR-1	Avoid tractor yarding over the existing road banks; restore all contours from landing or decking areas to natural shape, and revegetated disturbed areas with native vegetation. Yarding corridors next to roads would be located to avoid converging into large cleared areas.
VR-2	Use of irregular edges, openings, and clumps (1-5 trees of existing clumps, as cited in the treatment description) are recommended to further the visual diversity in these areas.
VR-3	For areas treated as Fire Containment Zones, the use of cutting; scalloping and feathering along landscape edge is required to vary the visual effect, and avoid unnatural straight lines. Maintain free-form shapes and edges that reflect natural open-space patterns in the landscape. The shapes should relate to the topographic form of the land to flow with the contours, following natural lines of hills, ridges, drainages, and rock outcrops. The feathering of edges should include undulating edges horizontally and diverse heights of leave trees vertically.
VR-4	Cut angles of stumps should face away from the primary view. Cut all stumps to one foot or less; except in highway corridor cut to 6" or less. The face-cut of stumps would be directed away from roads and developments, wherever possible
VR-5	Overall, it is important in all the above treatments to avoid straight lines and even spacing of leave trees both green and snags. This is especially important within 500' of the highway, roads, and private properties. Islands of trees and shrubs should be left wherever possible and their size, shape, and distance apart should vary.
VR-6	The treatment of residue will be important in all the areas and consideration should be given to completing this as soon as possible to reduce the time of visual intrusion. Another consideration regards piles for burning slash; they produce visually objectionable patterns if placed in uniformly or in rows. Diverse layout out in size and location of piles will result a more natural pattern of coloration and texture. Slash piles should be pulled away from edges, islands and individual trees to avoid accidental burning of vegetation intended to remain
VR-7	Some logging slash can be crushed and spread so that it appears like natural ground cover. Scatter small slash and pile and burn larger material in small piles.
VR-8	Piles would be placed in areas that provide natural screening in the immediate foreground. Slash piles are to be burned during the first available burning window the same year. Piles created in the immediate foreground would be burned to achieve 95% or more consumption, and following burning, unconsumed slash will be scattered and the scorched ground will be seeded with the approved seed mixture for this area.
Recreation	
RE-1	Schedule timing and location of treatment activity to occur when it has the least effect on the snowmobile and Mickelson Trail recreation resource. Keep access and use open during annual events and tours such as the Annual Mickelson Trail Ride (3 rd weekend in September each year). Schedule treatments during "shoulder seasons" when the recreation use levels are normally lower. Early morning may have less use than afternoons.
RE-2	Minimize use of skidders, caterpillars, or other heavy equipment on the Mickelson Trail.
RE-3	If treatments are within the snowmobile trails or the Mickelson Trail right of way, coordinate the treatment activity with the Black Hills Trail Office of the Division of Parks and Recreation.

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RE-4	If work is being done where a Mickelson Trail user could be in danger, the use of signs or flaggers will be used to assure the safety of trail users. This would include smoke management.
RE-5	Implement dust abatement procedures where project treatments would create a dust problem for the Mickelson Trail users.
RE-6	Develop a public briefing package on the project treatments and give wide distribution in order to have better community awareness of scheduled activities.
RE-7	Remove and dispose of excess slash adjacent to the Mickelson Trail in a timely manner to reduce the impacts on recreational users.
RE-8	Insure that piles for burning do not interfere with the use of the Mickelson Trail. Place piles a minimum of 50 feet from the trail.
RE-9	In areas where treatment acres are between private property and the Mickelson trail, treatments should include leaving clumps of trees to provide screening.

Appendix B-2: Project Monitoring

Table B-2: Monitoring Activities

Monitoring (By Resource Area)	Description of Monitoring Activity
Watershed/Soils	
WS-m1	BLM field office staff would monitor the activity areas during and after the project implementation to determine whether project design criteria and BMP's were implemented and whether or not they were effective in preventing impacts to soil and water resources. <u>Responsible Staff:</u> BLM Staff specialist or designated contractor
Wildlife	
WL-m1	Field surveys for Townsend's big-eared bats would be conducted in suitable habitat to determine if potential roosting and nursery habitat is being used and location of foraging habitat. <u>Responsible Staff:</u> Staff Wildlife Biologist or designated contractor
Noxious Weeds	
NX-m1	Monitoring for noxious weeds would occur on a yearly basis during the project treatments and for 1-2 years post-project activities. <u>Responsible Staff:</u> Staff range specialist, botanist, or designated contractor.
Lands	
LA-m1	Implementation monitoring: Conduct on-site inspections along right-of-way to verify that project activities are not impeding access, use or damaging the right-of-way. <u>Responsible Staff:</u> BLM Staff specialist or designated contractor
Archeology	
AR-m1	The archaeologist would monitor (on a case by case basis) the sites receiving protective treatments during project implementation and upon completion of the project to assure the preservation and protection of the heritage resources and determine the success of the proposed treatments. <u>Responsible Staff:</u> Staff Archaeologist or designated contractor.
Recreation	
RE-m1	Implementation monitoring: Conduct on-site inspections along snowmobile trails and the Mickelson Trail to verify that project activities are not impeding access, use, or damaging the trail. <u>Responsible Staff:</u> Staff recreation officer or designated contractor and right of way holder (SD Game, Fish and Parks Dept.)
RE-m2	Post-project monitoring: Monitor the recovery of the landscape for scenic viewing and recreation opportunity. User counts on the Mickelson Trail, On-site inspections, and photographs to assess the natural appearance of the project area adjacent to the Mickelson Trail. On-site inspections every year for first two years, then resuming as future maintenance treatments are scheduled and occur. <u>Responsible Staff:</u> Staff recreation officer or designated contractor and right of way holder (SD Game, Fish and Parks Dept.)