

## Appendix B: Bugtown Gulch Mountain Pine Beetle and Fuels Project Design Criteria

### Soil and Water

- Manage land treatments to limit the sum of severely burned and detrimentally compacted, eroded, and displaced land to no more than 15 percent of any land unit.
- On soils subject to compaction when wet, machinery operations must be restricted to dry or frozen soil conditions. Low impact equipment or equipment operating on slash may be used with close monitoring. See following tables for specific site locations.
- On soils with severe erosion potential or with high mass wasting potential and slopes steeper than 40 percent, ground skidding must be avoided.
- On soils with severe erosion potential or with high mass wasting potential and slopes between 20 and 40 percent, machinery operations must be restricted to dry or frozen soil conditions. See following tables for specific site locations.
- Where harvest occurs within the WIZ, require cut-to-length harvest systems.
- No temp roads will be utilized within the WIZ.

### No Activity Design Criteria

The following sites are areas with slopes greater than 40 percent with very high erosion hazard or high mass wasting. Machinery operations are not permitted on these areas.

No Activity Design Criteria				
Location	Site	Site Acres	No Activity Acres	% of Site
030603	2	128	6	5
030603	6	19	4	21
030603	23	3	2	70
030604	12	172	8	5
030604	15	64	3	5
030804	11	29	5	17
030804	12	22	5	22
030805	1	28	2	7
030805	2	80	5	6
030805	8	52	2	4
030805	11	113	4	4
030805	12	195	10	5

No Activity Design Criteria				
Location	Site	Site Acres	No Activity Acres	% of Site
030807	6	38	2	5
030807	9	125	5	4
030807	28	219	2	1
030901	13	12	8	67
030902	5	30	2	7
030902	6	6	2	31
030902	9	55	2	4
030905	3	100	11	11
030905	7	41	4	10
030905	17	67	9	13
030908	6	47	2	4

**Dry or Frozen Design Criteria**

These sites have slopes 20 to 40 percent with very high erosion hazard or high mass wasting. Machinery operations must be restricted to dry or frozen soil conditions.

<b>Dry or Frozen Design Criteria</b>				
<b>Location</b>	<b>Site</b>	<b>Site Acres</b>	<b>Dry or Frozen Acres</b>	<b>% of Site</b>
030905	7	41	13	32
030905	15	27	14	53
030905	17	67	13	19
030908	6	47	9	19

<b>Dry or Frozen Design Criteria</b>				
<b>Location</b>	<b>Site</b>	<b>Site Acres</b>	<b>Dry or Frozen Acres</b>	<b>% of Site</b>
030601	18	31	8	26
030601	50	19	4	21
030603	4	22	5	22
030603	6	19	6	31
030604	4	10	3	29
030804	11	29	5	17
030804	12	22	4	18
030805	1	28	7	25
030805	2	80	40	50
030805	4	16	7	44
030805	12	195	37	19
030807	5	48	19	40
030807	6	38	20	52
030807	9	125	38	30
030807	28	219	41	19
030901	10	29	9	31
030901	11	21	5	23
030901	13	12	3	25
030901	25	10	5	50
030901	26	14	9	64
030901	27	15	4	27
030902	4	34	6	18
030902	5	30	8	27
030902	6	6	3	47
030902	7	66	11	17
030902	10	58	29	50
030905	3	100	21	21
030905	5	23	9	39



### Compaction Design Criteria

These sites have soils that are subject to compaction when wet. Machinery operations must be restricted to dry or frozen soil conditions. Low impact equipment or equipment operating on slash may be used with close monitoring.

<b>Compaction Design Criteria</b>				
<b>Location</b>	<b>Site</b>	<b>Site Acres</b>	<b>Com-paction Acres</b>	<b>% of Site</b>
030601	1	67	66	98
030601	2	8	8	100
030601	3	14	14	100
030601	4	14	14	97
030601	6	116	79	68
030601	7	34	34	100
030601	8	68	68	100
030601	9	15	14	93
030601	12	21	20	96
030601	13	2	2	100
030601	14	47	47	100
030601	16	9	9	98
030601	17	60	46	76
030601	18	31	18	58
030601	19	110	101	92
030601	21	23	23	100
030601	22	13	4	32
030601	24	10	8	83
030601	25	44	44	100
030601	30	51	27	53
030601	34	71	63	88
030601	35	29	25	86
030601	36	20	19	97
030601	38	53	53	100
030601	39	5	5	100
030601	40	11	11	100
030601	41	9	9	100
030601	42	19	18	97
030601	43	13	13	100
030601	49	4	3	68
030601	50	19	13	70
030601	51	3	3	100
030601	52	11	10	93
030602	2	52	52	100
030602	3	50	49	99
030602	6	13	13	98
030602	7	45	45	99
030602	8	87	87	100

<b>Compaction Design Criteria</b>				
<b>Location</b>	<b>Site</b>	<b>Site Acres</b>	<b>Com-paction Acres</b>	<b>% of Site</b>
030602	10	89	89	100
030602	11	18	18	100
030602	13	32	32	100
030602	14	39	39	100
030602	15	12	12	99
030602	16	21	21	98
030602	17	58	58	100
030602	18	40	40	99
030602	19	15	15	98
030602	20	66	66	99
030602	21	20	20	100
030602	23	15	15	100
030602	25	12	12	100
030602	26	15	15	97
030602	28	27	27	100
030602	30	13	13	100
030602	31	29	29	100
030602	32	77	77	100
030602	33	5	5	91
030602	36	3	3	96
030603	1	158	155	98
030603	2	128	109	85
030603	3	21	21	99
030603	4	22	16	72
030603	5	13	3	22
030603	6	19	4	21
030603	7	84	66	79
030603	9	14	14	98
030603	11	29	12	41
030603	14	23	23	100
030603	16	11	11	100
030603	17	2	2	80
030603	18	6	4	66
030603	19	34	34	99
030603	20	40	34	84
030603	21	48	42	87
030603	34	8	7	91
030603	35	8	8	96
030603	37	3	3	98
030603	38	4	2	46
030603	40	7	7	96
030604	1	55	55	100
030604	2	25	24	97
030604	3	34	34	100
030604	4	10	6	59

<b>Compaction Design Criteria</b>				
<b>Location</b>	<b>Site</b>	<b>Site Acres</b>	<b>Com-paction Acres</b>	<b>% of Site</b>
030604	5	134	134	100
030604	6	28	28	100
030604	7	31	31	99
030604	9	49	48	99
030604	10	33	29	87
030604	12	172	136	79
030604	15	64	51	79
030604	16	41	28	69
030604	17	48	44	92
030604	18	21	21	100
030604	19	10	2	20
030604	22	11	11	96
030604	24	2	2	100
030604	27	40	40	100
030605	4	92	82	89
030605	5	14	3	22
030605	7	266	49	18
030605	15	12	12	99
030605	28	7	3	44
030606	3	91	91	99
030606	5	46	44	96
030606	6	118	46	39
030606	7	31	14	46
030606	8	96	51	53
030606	11	106	45	42
030606	12	96	27	28
030606	13	36	8	22
030606	14	70	39	56
030606	15	67	18	27
030606	18	36	36	100
030606	24	38	34	91
030606	26	6	5	78
030606	27	9	9	100
030607	1	19	8	42
030607	7	82	22	27
030607	9	12	12	100
030607	10	290	127	44
030701	4	40	37	92
030701	13	3	3	100
030803	2	92	92	100
030803	8	20	20	98
030803	9	11	11	98
030803	16	8	8	100
030803	18	74	74	100
030803	19	10	10	96

<b>Compaction Design Criteria</b>				
<b>Location</b>	<b>Site</b>	<b>Site Acres</b>	<b>Com-paction Acres</b>	<b>% of Site</b>
030803	20	36	34	95
030803	21	62	61	98
030803	22	53	53	100
030803	31	2	2	98
030804	2	18	8	45
030804	6	124	58	47
030804	7	6	6	99
030804	8	108	46	42
030804	10	231	129	56
030804	11	29	17	59
030804	12	22	13	58
030804	21	2	2	97
030804	22	14	4	29
030805	1	28	15	53
030805	2	80	21	26
030805	3	20	20	100
030805	4	16	5	32
030805	5	81	79	97
030805	7	141	81	57
030805	8	52	41	79
030805	11	113	78	69
030805	12	195	141	72
030805	13	27	25	93
030805	15	6	5	83
030807	5	48	10	21
030807	6	38	15	39
030807	7	54	46	84
030807	8	84	62	74
030807	9	125	55	44
030807	21	49	42	87
030807	23	104	41	40
030807	25	79	53	67
030807	28	219	136	62
030807	30	17	17	98
030905	6	20	8	40
030905	19	57	15	27
030908	7	24	14	60
030908	18	120	22	18
030908	24	18	15	82

## Recreation

- Remove hazardous trees along the snowmobile trail location.
- Affected Bear Mountain Ski Area trails will be signed and advertised as closed during harvest activities.
- Re-locate snowmobile trail during harvest operations.
- Sale contract specs will specify, in addition to any timing restrictions, that the snowmobile system trails and the Bear Mountain Ski Trails will be left clear of debris at the close of the unit.
- For safety concerns, adequate road signing should warn the public of logging activity including trucks hauling, closed roads, or other items associated with harvesting.

## Fuels

- Slash pile burning should be accomplished when air quality would be least affected.
- Activity fuels will be removed, lopped, scattered, or piled for later burning. Slash piles, other than those created for wildlife habitat, should be burned within one year if conditions allow.

## Timber

- The practices outlined in “Best Management Practices for the control of Non-Point Pollution from Silvicultural and Related Road Activities” will be followed.

## Visual Quality

- The most current Black Hills NF “Visual Marking Guides & Map” at the time of project will be followed for layout and marking implementation.
- Visual marking will be used within site distance of arterial and collector roads and private land with dwellings.
- Implement fuels projects to clean woody debris left from sale harvesting as early as possible to leave an open, park like setting for the recreation visitor. Mechanical chipping and shredding will be preferred over large piling of slash, especially in high visibility public areas such as along main roads for aesthetic reasons.
- Slash will be cleaned up to natural levels within 300 feet of these travel corridors. This could be accomplished by whole tree yarding so the slash is not placed on the ground or slash is cleaned up (chipping, mulching, piling & burning, underburning) after logging.
- Along Roads (FDR) 284, 285, 286, 287, 288, 291, 292, and County Road T317 :
  1. Clean up log decks within 300 feet of travel corridors by returning to original contours, scarify to eliminate compaction as necessary, and plant with native grass seed.
  2. Skid trails will generally be utilized during dry or frozen conditions to minimize soil disturbance. Where soil is displaced, the area will be re-contoured to the adjacent slope, and seeded with native grasses.
  3. Slash, once placed on the ground, will be treated in accordance with Forest Plan **Guideline 5606**. (Where the SIO criterion is High or Moderate, meet the criterion within one full growing season after completion of a project. Where it is Low or Very Low, meet the criterion within three full growing seasons after completion of a project.)

4. Treatments around private lands, in forested areas, should blend with the current condition on those lands, where possible. Strong lines between private and Forest Service boundaries will be avoided. The transition zone width will be dependent upon management and use of private lands, the slope, and the variety of vegetation. A feathered horizontal transition zone of 1.5 times the height of the overstory is recommended. Units that create an obviously un-natural vegetative pattern will draw attention to it and not meet LRMP, or national handbook direction. Particular locations where this is evident are:
  - a. Unit 030606-11, in Section 25 & 30 near Loues Creek (northeast portion of the planning area); the north border runs straight along the section line.
  - b. Unit 030606-16, in the same location.
  - c. Unit 030604-7, section 28; the western border (southern end) is on steep side slope parallel to the contours, private land appears very dense.
  
5. In the following units, boundary lines run straight up a slope, creating a very un-natural appearing transition. Efforts to avoid creating an obvious edge between the treated and un-treated areas will be implemented. At a minimum, a feathered horizontal transition zone of 1.5 times the height of the overstory is recommended. In addition, areas with higher and lower tree basal areas could be located in this area to further break up this transition zone and create a more natural appearance. These units are:
  - a. Unit 030807-28, in Section 22 (northwest corner of the planning area); the south border of the unit runs straight up the slope for 2,000 feet in elevation.
  - b. Unit 030605-18, in NW corner of Section 26 (south of the Custer – Pennington County border); the western border of the unit goes straight up the slope for 2,000+ feet in elevation.
  - c. Unit 030603-14, in Section 27 & 28 (south of the Custer – Pennington County border), the southern border of the unit goes straight up the slope for 1,300+ feet in elevation.
  - d. Units 030804-10 and 030804-10 in Section 3 (south of the headwaters of the Middle Fork of French Creek); the western border of the unit goes straight up the slope for 3,600+ feet in elevation.
  - e. Units 030803-16 in Section 3 (south of the headwaters of the Middle Fork of French Creek); the northern border of the unit goes straight up the slope for 1,600+ feet in elevation.
  - f. Units 030807-28 in Section 22 (in the south west corner of the planning area); the southern border of the unit goes straight up the slope for 2,000+ feet in elevation.

### **Noxious Weeds**

- Noxious weed control as proposed in identified post harvest (kv) projects is essential, as is monitoring the effectiveness of the noxious weed control and the effects of the noxious weed control on sensitive plant species.

### **Botany**

- The known South Dakota state listed plant occurrences will be identified on the map sensitive areas. These areas will also be flagged for avoidance.

- Meadows should be left undisturbed as much as possible; no skid trails, temporary roads, landings or burn piles should be allowed in meadows.
- Areas of riparian vegetation and those with a white spruce overstory may be habitat for R2 sensitive plant species. These areas will be left undisturbed as much as possible. No roads, skid trails, landings or burn piles will be constructed in these communities. Follow all Forest Plan Objectives, Standards, and Guidelines relating to R2 sensitive species, weed control, and revegetation.

## Wildlife

- In commercial thinning units, a minimum of 5 to 8 green trees per acre (5 on south aspects and 8 on north aspects) of the largest size class available will be retained for future snag recruitment as well as meeting other silvicultural objectives.
- In ponderosa pine sites, retain the following minimum densities of hard snags, unless snags are a safety hazard: (1) Retain (leave tree) a minimum of four snags per acre, in the largest size classes available in all harvest units. The hard snags need to be a minimum of 10 inches dbh and at least 25 feet in height, collectively 25 percent of which must be greater than 20 inches dbh. If 20 inches dbh or 25 feet high snags are not available, snags in the largest size class available would be retained (Standard 2301). These snags could be clumped but should also be well distributed (Guideline 2303).
- Retain all existing snags greater than 18 inches dbh within harvest units. Snags that must be felled because they are a safety hazard should be left in place for down woody material. All snags greater than 10 inches dbh are important in continuing to meet FP Standards, over time. Existing snags should be protected during fuels treatments, and other projects where feasibility and safety permits. (**Guideline 2305**- All soft snags should be retained unless they are a safety hazard.)
- Minimize the reconstruction standards of existing primitive roads needed for this project. Close temporary roads and (non-system user created roads/trails where possible) as soon as possible following timber harvest or other management activities.
- Existing mapped screening cover (3203 Guideline) would be protected by deferring all fuels treatments in these areas. Sanitation and commercial thinning treatments should protect pine regeneration (1 to 3 inches dbh) where it exists along arterial and collector roads (see map in project file).
- If trees greater than 20 inches dbh are present, at least one per acre must be left. These retention trees need not be in addition to the proposed stand density (40 basal area). These larger diameter green trees could be left in clumps that serve as turkey roost trees, or individually. This is intentionally designed to provide additional future vegetation management opportunities and wildlife habitat- and is in addition to Guideline 2306. (**Guideline 2306**- During vegetation management activities in ponderosa pine, retain a sufficient number of green trees greater than 20 inches dbh or from the largest diameter class available, to move towards or maintain an average minimum density of one large green tree per acre within the associated watershed, for the purpose of recruitment of snags and large diameter woody material.)
- **Guideline 3205 (Treated as Standard)** At least two to six turkey-roost sites would be provided per section, consisting of mature trees with an average dbh of 10 to 14 inches,

widely spaced horizontal branches, and a basal areas at least 90 square feet per acre. Sites should be at least ¼ acre in size and not isolated from adjacent forested stands. Emphasis should be on the upper 1/3 of east-facing slopes if available.

- The following RIS sites are listed to aid pre-sale crews in selecting roost trees sites.

<b>Location- Possible Turkey Roost Tree Sites</b>
030601-01,06,17,19,30,31,49,
030602- 7,14,32,
030603- 2,7,13,
030604-12,
030605-4,9,
030606-9,10,27,
030607-3,4,10
030803-20
030805-8,
030807-9,22,28,
030901-9,10,12,22,24
030902-9,10,23,26,
030905-3,8,17,19,
030908-8,13,

- Presale crews will use reasonable judgment in selecting more appropriate areas but roost sites must be selected on the following characteristics:
  - larger diameter (yellow-bark) pine- exceeding 10 inches dbh
  - located roost trees in clumps (sites 1/4 acre or greater in size) with at least 90 BA, where possible.
  - trees should have widely spaced horizontal branches
  - location emphasis is on upper 1/3 of east facing slopes (if available). Use other aspects west, south, and north as necessary to meet the Standard.
- During fuels treatment, activities will remove only those standing dead trees (greater than 10 inches dbh) which pose a definite safety hazard.
- Where slash piles are created, two to three piles per 10 acres of treatment area would be retained, except within 200 feet of private lands and 300 feet of travel corridors.
- Protect existing squirrel caches, and all existing large down logs (greater than 10 inches dbh) should be protected or left on site.
- Prescriptions should be designed so that large woody debris is left on harvested or thinned sites to help retain moisture, trap soil movement, provide micro-sites for establishment of forbs, grasses, shrubs, and trees, and provide habitat for wildlife.
- Whole-tree harvesting will not be used in sites designated for late succession management to benefit marten (transient individuals) by creating near-ground structure for prey species and protection from predators.
- Follow **Standard 3117** by not whole tree harvesting in the following sites:  
**030905-20, 04, 07, 15, 05, 03.**
- Any active raptor nest discovered during sale layout, sale operations, or non-commercial activities will be reported to the District Wildlife Biologist for evaluation. Modifications to Forest Service contracts, and/or mitigation measures such as seasonal/operational restrictions may be used to protect raptor nest sites. (*Guideline 3204* - Protect known current and historic raptor nests (other than goshawks).

- ***Guideline 1401(a)\* (Treated as a Standard)***- Avoid ground disturbance within 500 feet of an opening of a natural cave.
- Avoid ground disturbance around the entrance to abandon mines (adits/shafts) if they are identified as being used by bat species. Notify District minerals specialist, wildlife biologist, or archaeologist of mine locations when found by crews as they can also be safety hazards.

### **Other**

- Keep access open to the private landowners
- Dust abatement should be used on roads used for hauling where they occur next to private living structures