

Appendix B: Design Criteria for the South Project

The following design criteria are listed by resource area and do not suggest any particular order of priority. All activities proposed in this project, including post-sale activities and monitoring, require use of the design criteria.

Heritage

There are forty-seven eligible and fifty-eight unevaluated sites within the South project area. All of these sites require protection. Concurrence was received from the South Dakota State Historic Preservation Office on management recommendations for these sites. In most cases, the recommendation was to avoid the site during any ground-disturbing activities, including prescribed burning. More specific information on each site is available in the South project file. Site locations are protected information and not available for release under the Freedom of Information Act.

- An archeologist must be consulted during project layout for all ground-disturbing activities to insure these sites are protected.
- If, during the course of any ground disturbance related to this project, any bones, artifacts, foundations, or other indications of past human occupation of the area were discovered, work would stop and the district archaeologist would be contacted. The archaeologist would determine if additional consultation with the State Historic Preservation Office and applicable Native American Tribes would be required before work continued.

Hydrology and Soils

Utilize the most current State BMPs and Watershed Conservation Practices (WCPs). The following is a subset of management direction and does not preclude the need to meet all other BMPs and WCPs.

- Manage land treatments to limit the sum of severely burned, detrimentally compacted, eroded, and displaced land to no more than 15 percent of any land unit.
- Conduct prescribed fires to minimize the residence time on the soil while meeting the burn objectives. This is usually done when the soil and duff are moist.
- 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; or, when soil is not dry, frozen or covered by compacted snow, confine skidding to approved skid trails averaging 100 feet apart center to center. Track-mounted felling equipment may work off approved skid trails. Bunch trees to allow skidders to access them from approved skid trails. See Table 3.
- On soils with severe erosion potential or with high mass-wasting potential and slopes steeper than 40 percent, avoid ground-skidding.

- On soils with severe erosion potential or with high mass-wasting potential and slopes between 20 and 40 percent, restrict machinery operations to dry or frozen soil conditions. See Table 3.
- On soils with low organic matter, retain 50% or more slash after each shelterwood and group-selection harvest. If whole tree yarded, return required slash to unit following harvest. See Table 2.
- To minimize soil disturbance and erosion, limit roads and other disturbed sites to the minimum feasible number, width, and total length consistent with the purpose of specific operations, local topography and climate.
- Stabilize and maintain roads and other disturbed sites during and after construction to control erosion.
- Reclaim roads and other disturbed sites when use ends, as needed, to prevent resource damage. To reclaim is to re-seed/re-vegetate road to minimize erosion and reduce invasion by weeds. Scarify roads if necessary to create a seed bed.
- Initiate re-vegetation as soon as practical (preferably not to exceed 6 months) after termination of ground-disturbing activities.
- Construct roads and other disturbed sites to minimize sediment discharge into streams, lakes and wetlands.
- Avoid crossing perennial and intermittent streams to the extent practical. When necessary to cross a stream, a Forest Service representative will designate crossings.
- Avoid creating low-water crossings or 'fords' of streams.

WIZ Design Criteria by Site and Location

Protected stream courses have a Water Influence Zone (WIZ) which is 100 feet on either side of a stream (200 feet plus stream width). Activities can occur within most WIZ areas with the exception of the following:

- No activity is allowed within the WIZ adjacent to the following sites; 31010-7 and 38; 31003-12, 19, 20, and 25. The purpose of this restriction is to protect a riparian area.

Design criteria for activities within the WIZ include:

- limiting the amount of skid trails within the WIZ
- designating any necessary skid trails within the WIZ
- no mechanical site preparation within the WIZ

Sites in Table 1 contain a WIZ, therefore the above design criteria would apply.

Table 1 – Sites containing a Water Influence Zone (WIZ)

South WIZ Sites					
Location	Site	Site Acres	Wiz Acres	Prescription	% of Site
030910	12	158.37	2.94	CT	2
030910	9	27.18	1.17	GSH	4
030910	11	50.88	3.54	CT	7
030910	14	20.51	1.55	CT	8
030910	17	25.63	1.26	PE	5
030910	23	6.39	0.88	CT	14
030911	6	105.93	4.88	CT	5
031003	36	34.17	1.23	CT	4
031003	38	37.08	1.10	CT	3
031003	27	6.47	1.33	CT	21
031004	126	51.93	1.28	CT	2
031009	1	7.29	1.67	PE	23
031009	10	16.18	0.76	PE	5
031009	68	65.93	3.82	GSH	6
031009	84	71.94	1.19	SC	2
031009	207	7.10	3.35	PE	47
031009	152	32.49	2.98	SC	9
031010	29	1.80	1.00	PE	55
031103	16	25.39	1.16	PE	5
031103	38	15.59	1.59	PE	10
031110	48	37.02	1.09	PE	3
031112	18	143.38	1.41	PE	1
031210	28	6.65	1.17	PE	18

Low Organic Matter Design Criteria

Soils that have low organic material in the top soil require the following design criteria to maintain long-term soil productivity:

- *Retain 50% or more of the slash (less than three (3) inches in diameter) after each shelterwood and group-selection harvest. See Table 2 for a list of sites where this applies. Exception will be made in sites adjacent to arterial and collector roads and private land.*

Table 2 – Low Organic Matter Design Criteria

Low Organic Matter Design Criteria				
Location	Site	Site Acres	Low Organic Acres	% of Site
031402	29	30	5	16
031404	10	32	8	24
031404	40	6	1	18
031405	12	85	22	26
031406	16	80	23	29

Other Soil Design Criteria (see Table 3 for site list):

“No Activity” - Soils with a Very High Erosion Hazard Rating (VHEHR), or soils with a high mass-wasting potential on slopes greater than 40%.

- No machinery operations will be allowed on slopes greater than 40%.

“Dry or Frozen” - Soils with a Very High Erosion Hazard Rating (VHEHR), or soils with a high mass-wasting potential on slopes 20 to 40%.

- Machinery operations only permitted during dry or frozen conditions. Mechanical site preparation must be restricted to dry soil conditions.

“Dry, Frozen or Low Impact” - Soils that are subject to compaction when wet

- Machinery operations only permitted during dry or frozen conditions, or using low-impact equipment (such as cut-to-length systems). Equipment operating on slash may be used with close monitoring. Mechanical site preparation must be restricted to dry soil conditions; OR, when soil is not dry, frozen or covered by compacted snow, skidders will remain on approved skid trails. Skid trails will average 100 feet apart center to center. Track-mounted felling equipment will be allowed to work off of approved skid trails. Trees will be “bunched” to allow skidders to reach them from approved skid trails.

Table 3: Design Criteria for “No Activity”, “Dry or Frozen”, or “Dry, Frozen or Low Impact”

Location	Site	Site Acres	No Activity acres Alts 2&3	No Activity acres Alt 2 Only	Dry or Frozen Acres Alts 2&3	Dry or Frozen Acres Alt 2 only	Dry, Frozen or Low Impact acres Alts 2&3	Dry, Frozen or Low Impact acres Alt 2 only	Dry, Frozen or Low Impact acres Alt 3 only
030807	1	73					46		
030807	11	38					31		
030807	13	15					8		
030807	17	41					26		
030807	18	43					41		
030807	19	27					22		
030807	22	43					34		
030807	26	16					10		
030807	29	28					24		
030807	31	7					7		
030807	54	23					8		
030807	55	27					22		
030807	57	82					75		
030807	60	48					36		
030808	3	19	4		5		8		
030808	6	47	25		10		10		
030808	7	89					69		
030808	9	199	43						
030808	12	107	32						
030808	17	133			66				
030808	26	146			31		85		
030808	28	25					21		
030808	29	52			13		37		
030808	30	9					9		
030808	31	20					19		
030809	1	77					36		

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030809	2	20			13				
030809	3	21			8		10		
030809	5	37					37		
030809	6	76			16		51		
030809	7	42			13		24		
030809	8	42	7		10		23		
030809	9	25	6		5		14		
030809	10	14					13		
030809	12	107	32				61		
030809	14	137	29		28		30		
030809	17	243			53				
030809	19	32			10		8		
030809	21	23			6				
030809	30	50					31		
030809	35	44					43		
030809	36	15			5		8		
030809	37	31					16		
030809	39	18			9				
030809	42	75					36		
030809	43	102					64		
030809	44	21					18		
030811	31	22			4				
030811	32	21			9				
030908	12	3			1				
030908	19	10			6				
030909	1	91					16		
030909	38	1					1		
030910	1	39					14		
030910	2	59					14		
030910	3	10					7		
030910	4	112					63		
030910	9	27					11		
030910	15	49						40	
030910	18	7					5		
030910	26	20			5		9		
030910	27	30					24		
030911	1	39					28		
030911	2	106					48		
030911	4	24					24		
030911	5	108					26		
030911	6	47					16		
030911	8	35					15		
030911	16	30					18		
030911	18	19					4		
030912	2	421					87		
030912	4	17					8		
030912	5	16			3				
030912	8	48			15				
030912	9	16			8				
030913	7	90					50		
030913	10	11					10		

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030913	14	9					8		
030913	20	5					3		
031001	1	34					15		
031001	22	110					41		
031001	27	21					8		
031002	3	82					14		
031002	5	28					8		
031002	6	65					29		
031002	7	8			7				
031002	9	15					15		
031002	10	35					29		
031002	11	41					7		
031002	16	24	13		6				
031002	24	6					6		
031002	30	3					3		
031002	32	9					4		
031002	47	3					3		
031002	48	8	2		2				
031002	49	9	5		2				
031003	4	15	11		3				
031003	6	60			12				
031003	9	15		4					
031003	13	27	7		6				
031003	16	25	6		10				
031003	20	28			12				
031003	30	6	3		2				
031003	31	11	6		3				
031003	33	16	11		4				
031003	38	8			7				
031003	39	7	3		3				
031003	40	9			3				
031003	43	38	14		18				
031003	45	52	8						
031003	48	18	6						
031004	7	31			6				
031004	9	75	24						
031004	12	29			5				
031004	16	134					23		
031004	22	13					2		
031004	23	16			9				
031004	24	12			5				
031004	25	19				5			
031004	30	17			5				
031004	32	43					12		
031004	34	21					13		
031004	35	17					13		
031004	37	9	4		2				
031004	38	20					6		
031004	39	18			5				
031004	41	48	8						
031004	43	3					1		

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031005	3	17					3		
031005	7	44					34		
031005	12	6					6		
031005	13	122					30		
031005	15	17					6		
031005	43	47					30		
031006	8	23			7				
031006	9	32					12		
031006	10	43				11			
031006	11	88			24		14		
031006	12	36			9				
031006	14	55			25				
031006	17	20					10		
031006	18	32	15		6				
031006	20	57			23				
031006	21	28			15				
031006	27	54					48		
031006	33	43					22		
031006	38	18					8		
031006	42	106	21		33				
031006	48	24			12				
031006	49	7			4				
031006	50	6	2		4				
031007	4	21			7				
031007	5	41			7				
031007	6	29			8				
031007	8	35			10				
031007	9	26			11				
031007	12	25			5				
031007	13	55			19				
031007	16	4					4		
031007	31	2			1				
031007	37	62				13			
031007	40	14			4				
031007	41	10			2				
031007	43	179					54		
031007	46	9			6				
031008	3	14			3				
031008	9	79			14				
031009	3	11			5				
031009	5	55			34				
031009	6	46			9				
031009	8	28			6				
031009	20	33			7				
031009	34	66			21				
031009	35	53				18			
031009	42	72	19		26				
031009	47	32	5		14				
031009	48	31			9				
031009	49	15			4				
031009	50	22				4			

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031009	51	26			12				
031009	55	36			6				
031009	57	26			6				
031009	67	24			13				
031009	69	7			2				
031009	70	9			7				
031009	76	32	11		13				
031010	1	6			4				
031010	2	40		9		12			
031010	3	64				30			
031010	6	38			15				
031010	9	92			30				
031010	11	46	19						
031010	12	67			24				
031010	15	12			2				
031010	16	70			17				
031010	20	23	5		14				
031010	21	49	8		11				
031010	25	44			17				
031010	28	40				6			
031010	41	26			11				
031010	43	30			19				
031010	47	5			3				
031010	48	5			4				
031101	5	33						10	
031101	22	32						13	
031102	2	74						68	
031102	3	65						61	
031102	5	54						45	
031102	6	5						2	
031102	8	60						38	
031102	9	69						25	
031102	11	27						20	
031102	12	5						3	
031102	35	12						5	
031102	36	13						12	
031102	39	6						6	
031102	44	10			6				
031102	49	1						1	
031103	1	73			28				
031103	2	65	12		23				
031103	3	96	28						
031103	4	30	5		6				
031103	5	36			18				
031103	7	24	10		6				
031103	9	82			19				
031103	10	153	30						
031103	13	54	9		9				
031103	14	47	24		8				
031103	20	59	18		12				
031103	23	35			9				

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031103	24	18			8				
031103	25	35	10						
031103	34	24	11		4				
031103	35	11	5		2				
031103	36	8	2		4				
031103	37	5			2				
031103	38	13	3		8				
031103	40	11	2		4				
031103	41	16	3		5				
031103	46	22			10				
031103	47	2	2		1				
031103	48	13			6				
031104	1	62			17				
031104	2	37			15				
031104	5	11					5		
031104	10	10	6		4				
031104	11	27	7		15				
031104	13	36			7				
031104	14	77			32				
031104	17	76			17				
031104	18	13			7				
031104	22	11	2		3				
031104	30	5					1		
031104	41	6	2		1				
031104	52	13					7		
031104	55	10			3				
031105	9	37			18				
031105	16	4					1		
031105	17	11					3		
031106	7	42			11				
031107	32	50	15						
031107	34	8	2						
031107	35	23			6				
031107	37	11			6				
031107	43	57			11				
031110	5	73					31		
031112	11	28				8			
031205	17	16					15		
031205	37	7					7		
031205	39	11					10		
031205	41	59					49		
031205	48	11					11		
031208	3	56					56		
031208	4	51					51		
031208	5	72					72		
031208	8	29					29		
031208	10	32					32		
031208	12	2					2		
031209	2	23					18		
031209	3	63					24		
031209	4	31					6		

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031209	5	48					47		
031209	6	65					35		
031209	7	100					54		
031209	9	31					30		
031209	10	19					10		
031209	12	44					28		
031209	13	18					11		
031209	17	19					19		
031209	18	35					21		
031209	19	4					4		
031209	20	33					16		
031210	1	103							90
031210	2	32					25		
031210	3	63					24		
031210	4	52					42		
031210	5	24					24		
031210	7	12					11		
031210	14	30							30
031210	15	17					15		
031210	19	21					9		
031210	20	20					20		
031210	24	25					13		
031210	26	30					15		
031210	30	11					4		
031210	35	16					13		
031401	4	31			15				
031401	6	70			11				
031401	8	85			20				
031401	21	14			6				
031401	23	25			4				
031401	24	25			8				
031401	29	10	2		5				
031402	1	43			21				
031402	8	40				24			
031402	10	55			23				
031402	16	39			7				
031402	32	8			2				
031403	21	44			8				
031403	53	10					3		
031404	40	6					1		
031406	3	42			14				
031406	5	23			10				
031406	13	63			14				
031517	3	10			4				
031517	6	17			4				
031517	37	23			13				

Lands

- There are 7 FLPMA and 12 FRTA easements, 1 DOT easement and 1 special use permit (for a water transmission line) within the South project area
- Ensure landowner's access is retained and they are aware of proposed road closures
 - Keep open all roads with easements and/or special use permits (rights-of-way, etc.)
- After all vegetation management activities, reconstruct roads to at least pre-use conditions
- If a need for private land access is identified, work through the application procedures with the Lands Specialist and the proponent to obtain an easement or special use permit
- Adhere to agreements specified in temporary road special use permits if such use is needed and a permanent right-of-way easement is not granted

Range and Noxious Weeds

- Noxious weed control, as proposed in identified post-harvest (kv) projects, is essential, as is monitoring the effectiveness of noxious weed control
- Treat known noxious weed infestations with herbicides and biological controls after logging operations and/or prescribed burning to reduce further infestations and allow native vegetation to compete with non-natives
- Seed disturbed areas such as skid trails, burned slash piles and temporary roads with certified weed-free seed
- Coordinate prescribed burning schedule with the grazing schedule
 - Coordination between the burn boss and grazing permit administrator will ensure that adequate fuels are available prior to burning
 - Grazing permit administrator must inform the burn boss of any changes in the grazing rotation schedule
 - Grazing permit administrator will ensure that recovery of vegetation after burning is adequate before grazing resumes, to comply with Forest Plan Guideline 4107
 - Limit prescribed burning to one unit per grazing system per burning season
 - Conduct prescribed burning prior to green-up in the spring or following curing in the fall
- Follow all Forest Plan Objectives, Standards, and Guidelines relating to R2 sensitive species, weed control, and revegetation. These include, but may not be limited to the following:

Standard 1110

Initiate revegetation as soon as possible, not to exceed 6 months after termination of ground-disturbing activities. Revegetate all disturbed soils with native species in seed/plant mixtures that are noxious weed-free. On areas needing the immediate establishment of vegetation, non-native, non-aggressive annuals (e.g., wheat, oats, rye) or sterile species may be used while native perennials

are becoming established, or when native species are not available (e.g., during drought years or years when wildfires burn large acreages in the United States). Other aggressive non-native perennials (e.g. smooth brome, timothy) will not be used. Seed will be tested for noxious weeds (approved Black-Hills-specific North-Zone and South-Zone seed mixes are available). If mulches are used, they are to be noxious-weed free.

Recreation

- Close temporary timber sale roads as early and as effectively as possible following final management activity to discourage unauthorized use
- Follow Forest Plan Guideline 5209 for harvest prescriptions around Comanche Park Campground to ensure leaving a variety of size and age classes of trees
 - This will maintain privacy between campsites and make the setting more visually appealing
 - No activity to occur within Comanche Campground from May 15 through September 15.
- Post-harvest mechanical chipping, shredding and small “tepee” style slash piling is recommended for aesthetic reasons in high-visibility public areas such as along main roads and near recreation sites
- For safety, utilize adequate road signing and campground bulletin board posting to warn the public of logging activity including truck hauling, closed roads or other items associated with harvesting
- Design water-source-protection fences to allow recreational horseback riders to access water for their animals, where appropriate.
- Design all gates or other closure devices to allow passage by area-appropriate recreational traffic such as horse use, hiking, skiing and/or OHV riding
- Special Use Permit: protect authorized Outfitter and Guide trails within location 031517 from slash and piling.
 - In this location, where authorized trails are within sale units, avoid operating from Memorial to Labor Day, which is the peak season of use by the outfitter. Notify the authorized Outfitter/Guide prior to harvest activity or prescribed burning within this location.

Scenery

Transition Zones

Treatments around private lands, in forested areas, should blend with the current condition on those lands, where possible.

- Avoid creating strong lines between private and Forest Service boundaries.
- Avoid creating an obvious edge between the treated and un-treated areas, particularly where one boundary line, or more, runs straight up a slope (at a right angle to the contours) creating a very un-natural appearing form in the landscape.

- The transition zone width is dependent upon management and use of private lands, slope, and variety of vegetation. A feathered horizontal transition zone of 1.5 times the height of the overstory is recommended – at a minimum.
- Within this zone, reduce the density and tree size to transition from the treated area to the un-treated area. Units that create an obvious un-natural vegetation pattern will draw attention and not meet Forest Plan or national handbook direction.

In addition, this technique should be used along the unit boundaries, particularly overstory removal and seedcut treatments. This technique is commonly used, although it has been found to be most effective when it is adjusted to fit the specific site. The minimum transition zone is less effective in some circumstances, such as from a very dense stand to an opening (i.e.-along the edge of an overstory removal). Hence, it is important that the transition zone be adjusted (2.5 times the height of the overstory trees) for the specific site conditions & treatments.

Transition Zone design criteria applies to the following specific sites:

- Site 031104-17 – Southwest edge is straight up a steep 100’ tall vertical slope. Feather the edge to avoid creating a straight line between the cut and un-cut areas.
- Site 031104-22 – East-northeast edge is straight up a steep 100’ tall vertical slope. Feather the edge to avoid creating a straight line between the cut and un-cut areas.
- Site 031009-57 – North & south unit boundaries go straight up a steep 200’ tall vertical slope. Feather the edge to avoid creating a straight line between the treated areas.
- Site 031006-8 – This unit is in the foreground of Hwy. 16 which has a “High” scenic integrity objective (SIO). The unit is approximately 22 acres, with 10 acres readily visible. To break up this opening, retain one island of trees, 1-2 acres in size, mid-slope, at the 5600’ elevation line
- Site 030808-17 – This unit is approx. 133 acres in size. The east unit boundaries (visible from Danby Park – High SIO) go straight up a 200’ slope. Feather the edge to avoid creating a straight line between the treated areas. The west unit boundary goes straight up a 300’ slope. Feather the edge to avoid creating a straight line between the treated areas.

Roads and Scenery

Use the following design criteria within 300 feet of US Highway 16, County Road 273 (Pass Creek), 715 (Pleasant Valley), 316 (Loring Siding), 315 (Hopkins Flat), 653 (Stagg Rd), and Forest Development Roads (FDR): 141 (North Pole Road), 142 (Lightning Creek).

- Utilize skid trails when soil conditions minimize potential for soil disturbance and displacement (rutting)
- Seed skid trails with native grasses following disturbance
 - These techniques effectively reduce soil displacement and speed up re-vegetation, which reduces visual evidence of skid trails.
- Where possible, vary size and spacing of remaining vegetation along roads.

- This technique is effective in maintaining a natural appearance. Locations where not used resulted in a ‘tree-farm’ appearance (all trees same height & evenly spaced across the landscape).
- Within 300 feet of State and Federal Highways, return log deck areas to original contours, scarify to eliminate compaction (as necessary), and re-vegetate using native grass seed
- Treat activity fuels to meet Forest Plan Standard 4112
- Follow the most current Black Hills NF “Visual Marking Guides & Map” at the time of project layout & marking implementation

Guideline 5606

Where the scenic integrity objective (SIO) criterion is high or moderate, meet the criterion within one full growing season after completion of a project. In the wildland urban interface (WUI) areas, the moderate SIO should be met within 2 to 4 years after the fire-hazard objective is met. Future management activities in WUIs shall meet SIO within 1 year of treatment,. Where it is low or very low, meet the criterion within 3 full growing seasons after completeion of a project.

Table 4: Sites where Road/Scenery design criteria applies

Location	Site	Approx Acres	Location	Site	Approx Acres	Location	Site	Approx Acres
30807	1	73	30911	12	36	31111	22	65
30807	11	38	30911	14	9	31111	40	18
30807	13	15	30911	19	50	31112	12	424
30807	17	41	30913	10	11	31113	9	44
30807	18	43	30913	14	9	31113	10	119
30807	26	16	31001	4	19	31113	31	19
30807	54	23	31001	6	151	31113	32	7
30807	55	27	31001	22	110	31405	7	78
30807	60	48	31001	27	21	31406	6	66
30808	19	88	31001	30	7	31406	15	118
30809	2	20	31002	1	35	31406	16	80
30809	5	37	31002	31	7	31406	17	35
30809	6	76	31002	41	13	31406	20	15
30809	9	25	31003	5	13	31407	1	97
30809	12	107	31003	11	41	31407	7	276
30809	14	137	31003	23	33	31407	8	140
30809	18	65	31003	48	18	31407	13	7
30809	20	124	31005	5	144	31407	14	41
30809	21	23	31005	17	103	31515	23	2
30809	35	44	31005	43	47	31516	1	7
30809	36	15	31006	36	15	31516	2	86
30809	42	75	31007	28	100	31516	3	7
30809	43	102	31008	8	36	31516	10	87
30809	44	21	31009	13	62	31516	26	4
30811	31	22	31009	14	32	31516	27	23
30910	1	39	31009	51	26	31516	28	6
30910	2	59	31009	56	25	31517	1	8
30910	4	112	31010	8	10	31517	2	9
30910	7	27	31010	23	114	31517	3	10
30910	9	18	31010	19	80	31517	4	52
30910	10	60	31010	44	9	31517	11	6
30910	11	51	31011	2	222	31517	23	6
30910	14	21	31011	3	72	31517	37	23
30910	17	25	31011	5	55			
30910	26	20	31011	8	246			
30910	27	30	31011	12	11			
30910	32	27	31011	13	31			
30911	8	35	31111	8	114			

Silviculture:

- Lop, scatter or pile activity fuel for later burning; burn slash piles, other than those created for wildlife habitat, within one year (weather permitting) to reduce the risk of Ips beetle-related tree mortality
- Design broadcast prescribed burning to limit mortality to 20% or less in pole-sized and saw-timber-sized pine sites
 - restoration thinning sites in MA 5.1A are not subject to this mortality limit
- Follow practices outlined in “Best Management Practices for the Control of Non-Point Pollution from Silvicultural and Related Road Activities”
- Use visual marking as per the Forest visual marking guidelines

- Within harvest units, remove merchantable trees identified as diseased or insect-infested in order to reduce future infestations
- In sites 031007-17 and 031403-04, if post-sale field reviews determine that site preparation is warranted, conduct this treatment with a tractor blade with a maximum of four teeth to limit soil disturbance. Space swaths at least 24 feet apart to limit impacts to soil to 15 percent of any land unit per Forest Plan Standard 1103.
- Remove commercial-sized conifers from within the two aspen sites (030908-12 and 030910-16) by whole-tree harvest in such a manner to insure limiting damage to remaining aspen and to eliminate shading of the ground by logging slash. This will meet FP Standard 2205.
 - Where aspen (individual trees or clones) occurs within pine sites with proposed treatments, remove all pine from 66 feet surrounding the perimeter of the individual or clone. This will encourage expansion of these hardwoods
 - If conifer slash removed from the aspen clone is to be piled and burned, place piles at least one aspen-tree-height away from the edge of the aspen clone to avoid damage to the roots from intense heat during burning (Sheppard, 2004)

Smoke Management

Smoke impacts are minimized utilizing the following design criteria and are incorporated into the burn plan as appropriate:

- Limit treatment area size
- Specify wind directions and speed
- Specify minimum mixing heights to ensure dispersal of emissions
- Stagger ignitions

Wildlife and Botany

Sensitive Species and Species of Local Concern (SOLC)

- Buffers of approximately 2 acres will be designated to protect known SOLC snail sites.
 - To comply with Standard 3103, consult the District wildlife biologist prior to layout and implementation of vegetation treatments and prescribed burning to ensure protection of the following sites:

Table 5: SOLC Snail sites

SOLC Snails Sites	RIS Site	Treatment Proposed
F-128	031003-48/15	Vegetation treatment
F-267	031007-20	Prescribed burn
	031008-28	Vegetation treatment and Prescribed burn

- No Sensitive or SOLC species of fauna or flora are known to occur in springs or seeps in the South project area
 - Standard 3104: If any sensitive or SOLC species are discovered at a spring or seep, do not change those natural water features into developed watering facilities
- Meadows and riparian areas may be habitat for R2 sensitive plant species
 - Locate skid trails, temporary roads and slash piles out of grasslands, meadows, and/or hardwood communities, unless no alternative sites are available, to reduce the potential spread of invasive plant species that reduce native plant diversity
 - When there is no option but to locate a skid trail in such a site, limit the number and length of skid trails to those that are necessary to accomplish treatments (Objectives 217, 218, 221 and 230)
- Check known Cooper’s hawk nest for activity prior to ground-disturbing activities within ½ mile of the nest
 - If this nest becomes active, then sites 030809-20,19,14 and FSR 288 would require a ½ mile no-new-activity buffer as recommended in USFWS Guidelines for Raptor Protection (2002) from March 15 through August 31 (Standard 3204).

Goshawks

- Six active and/or historic goshawk nests occur within the South project area
 - Where prescribed burning and IC thinning is proposed within designated nest areas, defer prescribed burning until after IC thinning has been accomplished
- Check historic goshawk nests each year to see if they are active
- If nests are active, then apply Standard 3111: Timing of activities
 From April 1 through August 15, minimize additional human-caused noise and disruption beyond that occurring at the time of nest initiation (e.g., road traffic, timber harvests, construction activities) within one-half mile of all active goshawk nests up until the nest has failed or fledglings have dispersed
- The following table identifies Goshawk territories and roads within ½ mile of a known goshawk nest.

Table 6: Roads within ½ mile of known goshawk nests

Territory Name	Road Numbers
Comanche	307, 307.1D, 307.1Q
Wabash	781, 781.1E, 781.1D, 665.1B
Lightning Creek	No system roads within ½ mile
Ninemile	309
Pleasant	309.1B
Martin	310.1A

Sensitive Species and Contractual Obligations

Standard 3115

A R2 sensitive species or species of local concern located after contract or permit formation will be appropriately managed by active coordination between permittee, contractor or purchaser, Forest Service line officer, project administrator, biologist and/or botanist. Solutions need to be based on the circumstances of each new discovery and must consider the species need, contractual obligations and costs, and mitigation measures available at the time of discovery.

Standard 3116

Avoid creating barriers (e.g., new open roads) between red-bellied snake hibernacula and wetlands.”

- There are no known red-bellied snake hibernacula in the South project area. However, likely habitat occurs in the riparian area located between sites 31010-07, 39 and sites 31003-12, 19, 25, along Forest Service Road 715.3E. Construct no new roads within this area.

Standard 3117

- In all vegetation treatment sites where small slash piles are created post- harvest, other than Improvement Cutting sites, leave 1 slash pile unburned per 2 acres for wildlife habitat. These piles are not to be left within 300 feet of buildings..
- In sites where IC (Improvement Cutting) occurs, leave up to 5 unburned slash piles per acre, except where prescribed burning is planned, or within 300 feet of buildings or arterial roads.

Standard 3125

Implement prescription burning on no more than 60 percent of any contiguous grassland area at a time, and burn in early spring or fall.

Management Indicator Species

- Grassland Species Protection - To protect potential nesting habitat for grassland bird species (grasshopper sparrow), apply prescribed burning in the fall season (after August 1st).

Table 7: Sites where fall Rx burn required

Fall burn in these grassland sites:
031407- 7, 8, 14
031112- 12

Caves and Bats

- Six caves serve as roosting sites for bats and will require a “no-disturbance” buffer to avoid altering cave conditions (*Standard 3207 and 1401*)
 - Consult with the District biologist concerning layout for vegetation treatments and burning within sites 31005-17, 31007-3, 5 and 43, 31008-28, 31104-14 and 31402-9
 - No-disturbance buffers may be up to 500 feet from a cave opening

Snags and Down Woody Material

Standard 2301

- Retain all snags unless they are a safety hazard.

Standard 2304

- Prohibit cutting of standing-dead trees for fuelwood in the South project area..

Standard 2305

- All soft snags should be retained unless they are a safety hazard
 - Soft Snag protection during prescribed burning operations:
 - Where feasible, use firing techniques, hand-lines, or foam to protect soft snags (and any associated squirrel caches) from consumption by fire
 - Protect snags that are known/obvious roost or nest sites (use handline, foam, etc.)

Guideline 2307

- Leave large woody debris on harvested or thinned sites to retain moisture, trap soil movement, provide micro-sites for establishment of forbs, grasses, shrubs, and trees, and to provide habitat for wildlife

Standard 2308

During vegetation management activities on Ponderosa pine forested sites, retain an average of at least 50 linear feet per acre of coarse woody debris with a minimum diameter of 10 inches.

- *Down Woody Debris protection during prescribed burning operations*
 - Monitor fuel moisture levels (10,000 hr. fuels- 8”dbh and larger) so that burning operations consume less than 50% of existing ground fuels of this size class (*Guideline 2307 and Standard 2308*)

Other Wildlife

Big Game Screening Cover-(Guideline 3203)

Currently big game screening cover along project arterial and collector roads exceeds the direction in Guideline 3203. However, in the following sites where they contact project arterial or collector roads, post-harvest treatments (thinning, Rx burning) are to retain existing big-game screening

cover within 200’ of the road. This will ensure that Guideline 3203 will continue to be met in the project area.

Table 8: Big-game Screening Cover Retention

Big Game Screening Cover Retention Areas - Road Name/Number	RIS SITE
Pleasant Valley - FSR-715	031010-19,23
Stagg Road - FSR-653	031205-41
North Pole Road - FSR-287	030910-32
Lightning Creek Road - FSR-288	030809-14

- If new raptor nests are found during project layout and implementation:
 - **Standard 3204:** consult the District biologist to insure that nests are protected
 - No-new-activity buffers of ½ mile will be required for active raptor nests, based on the USFWS Raptor Protection Guidelines (2002); timing of restriction varies by species

Guideline 3205

- Provide at least 2 to 6 turkey-roost sites per section (approximately 67 sections within South), consisting of mature trees with an average diameter at breast height (DBH) of 10 to 14 inches, widely-spaced horizontal branches, and basal areas at least 90 square feet per acre. Sites should be at least one-fourth acre in size and not isolated from adjacent forested stands. Emphasis should be on the upper third of east-facing slopes if available.
 - Designate 134 (minimum) to 402 (maximum) turkey roost groups in the project area
 - In the project area, locate at least one (1) turkey roost site near each guzzler (12 guzzlers in project area) whenever possible. See Table 9 for guzzler locations. Also listed in the table are adjacent sites with suitable turkey roost habitat which can be considered if the guzzler sites do not contain suitable roost habitat.
 - Maintain sufficient buffers of approximately one tree-height around each guzzler to protect the structure from possible damage during timber operations

Table 9: Guzzler sites and nearby sites with suitable turkey roost habitat

	Guzzler Sites	Adjacent sites with suitable Turkey roost habitat
1	031107-44	031107-04,38
2	030809-34	
3	030809-39	030809-17
4	031007-03	031007-05,43
5	031003-29	031003-01
6	030807-32	030807-32
7	031102-45	
8	031008-01	031008-02
9	031009-23	031009-34
10	031402-10	
11	031516-14	031515-02
12	031517-75	031517-18

- Protect the prairie dog town in site 31407-8 by excluding skidding and logging equipment and piling of slash within the perimeter of the colony
 - Exclude prescribed fire in this site during the spring and summer to protect breeding habitat
- All sites where both Improvement Cutting (IC) and prescribed burning are proposed must have the IC treatment completed prior to implementation of the prescribed burn, or must be avoided during prescribed burning.
 - Limit overstory mortality from prescribed burning to no more than 5% within these sites.
- Avoid the following Structural Stage 5 sites during prescribed burning: 31104-50 and 31405-6
- For site 31010-50, when conducting prescribed burning, limit overstory mortality to less than 5% in order to retain large-diameter trees