

Social Environment

Recreation

Affected Environment:

The only maintained hiking trail in the Elk Bugs and Fuels project area is the Centennial Trail. This 111-mile trail, is part of the National Hiking Trail System, and runs from Bear Butte State Park (north of Sturgis) to Wind Cave National Park in the southern hills. The trail is primarily used for non-motorized recreation, but a section of the trail, from Pilot Knob trailhead to Dalton Lake trailhead, is open to motorized use. This trail is also heavily used by mountain bikers between Bear Butte and Dalton Lake.

There are no developed recreation sites within the project area, other than the seldom-used Elk Creek trailhead of the Centennial Trail. The nearest Forest Service campground, Dalton Lake, is located three miles south of the project area. With the growth of the Sturgis Motorcycle Rally, a number of campgrounds have been developed along the eastern edge of the project area, all of which are located on private property and outside of the Forest Boundary. These private campgrounds do not have roads leading onto the National Forest but the campers use Forest Lands for a variety of activities (hunting, hiking etc.)

Since the conversion of FH 26 (Sturgis to Nemo road) from a single lane gravel road to a two lane paved road, recreation activity in the project area has increased significantly. The main recreation activities occurring within the project area are driving for pleasure, hiking, mountain biking, ATV use, hunting, rock climbing, horseback riding, and rock hounding.

The area is heavily used for hunting much of the year. Game species in the area are: turkey, grouse, elk, deer and coyote. The eastern side of the project area is very popular for spring turkey hunting. Big game and fall turkey seasons start in late August and continue on into December.

Due to the nature of the geologic setting, only streams on the west half of the project area have sufficient water to support fish populations. Stream fishing for trout is limited to Bear Butte Creek around Galena, Meadow Creek and Elk Creek.

The Deadman Summer Home Group is located in the northeast corner of the project area. This area was established in the 1920s and allowed private individuals to construct a summer cabin on National Forest System Lands and was authorized by a recreational Special Use permit (new summer home groups are not allowed on National Forests). There are four cabins in this group and they are accessed by road U040036.

There are numerous caves in the project area, two of which are set up for commercial operations. Bethlehem Cave is located on private property and is managed as a commercial stop with cave tours and other events. Wonderland cave is located on National Forest System Lands and is under a Special Use Permit to a private individual to

provide cave tours to the general public. Due to the uplifted nature of the sedimentary rock in this area, there are numerous small caves that provide caving experiences to the public.

The area also supports three off road travel events during the summer and fall. These recreation events consist of guided tours using extremely primitive roads and boulder filled dry creek beds for their travel ways. These events are under Special Use Permits issued to two local clubs and one large corporation, which sponsor the three events. Hundreds of 4-wheel drive jeep type vehicles are involved in these events.

The area also has two Outfitter Guide Special Use Permits, one for hunting and the other for guided horseback trail riding. These permits are issued to private individuals.

In the very northeast portion of the project area, along Two-Bit Creek and Boulder Creek, there are numerous mining claims used for gold panning activities by various gold panning clubs and individuals.

Environmental Consequences:

Direct and Indirect Effects on Non-Motorized Recreation

If mitigation measures are implemented as described, there would be no effects from logging, thinning or road building along the Centennial trail from activities proposed in any of the action alternatives. Other forms of non-motorized recreation should not be affected by the proposed activities except for the closing of some unimproved roads that are used by hikers and mountain bikers.

Direct and Indirect Effects on Motorized Recreation

Alternative 1 does not decommission any existing roads so there would be no impacts to motorized recreation. Alternative 2 would decommission 60.7 miles of undeveloped roads (non-system roads) within the project area. Alternative 3 would decommission 62.0 miles of non-system roads. Alternative 4 would decommission 55.9 miles of non-system roads. The majority of these roads are short spurs that come off of existing roads and may have functioned skid trails in past timber sales. Most are not through roads and have little effect on recreation. Existing non-system roads used for the off road travel events under special use permits would not be closed and would be available for public use.

Cumulative Effects

The fuel breaks constructed under legislative direction have impacted the Centennial trail, with additional impacts possible from thinning activities in the Alkali and Northwind

timber sales. Mountain pine beetle infestations are apparent in numerous sections of the trail and need treatments. Mitigation measure described in this analysis will be implemented for the Alkali and Northwind sales, in order to protect the trail as much as possible, with trail corridors retaining 60 to 80 basal area after thinning. Impacts from thinning along the trail will be kept to a minimum.

Travel along roads 139 and 169 have been heavily impacted by the construction of a 200-foot fuel break along each side of the road. This activity was a result of legislative action and was completed in early 2003. The fuel breaks have caused openings in the timber, providing some vistas over looking Beaver Park and other portions of the Forest and the Eastern Plains. The portion of Centennial Trail that was on FDR 139 will be moved to the edge of the fuel break.

Scenery

Affected Environment:

Introduction

Scenery, as well as other natural resources, must be cared for and managed for future generations. Visual resources vary by location and existing natural features including vegetation, water features, landform and geology, and human-made elements. All activities forest visitors experience are performed in a scenic environment defined by the arrangement of the natural character of the landscape along with components of the built environment.

Landscape Character Description

“The Black Hills are a maturely dissected domed mountain range surrounded by the Missouri Plateau. According to Physiography of the Western United States, the Black Hills comprises the Black Hills section of the Great Plains province.” Appendix B- Description of the Analysis Process, BHNF Forest Plan Revision FEIS.

The project area lies within the Laccolith Mountains landscape character type. This area is described as follows.

“Numerous hills or small mountains are the surface expression of intrusive magmas, doming upward the overlying sediments. These intrusions occurred during the uplift of the Black Hills region (64.5-40 million years ago). The Laccolith Mountains range in diameter from less than a mile to as much as 10 miles and actually consist of laccoliths, stocks and sills. Laccoliths occur at Custer Peak and Sundance Mountain, stocks at Bear Butte and Devils Tower, and sills near Galena. Terry Peak is the highest surface expression of these intrusive bodies, reaching 7,071 feet above sea level. Most of the other Laccolith Mountains range from 5,000 to 6,500 feet in elevation. Mass stability problems for this Physiography area are comparable of the granitic region of the Central Crystalline Area.” Appendix B- Description of the Analysis Process, BHNF Forest Plan Revision FEIS.

Most of the Forest has been intensively managed for a long period of time. This manipulated landscape has become the accepted natural appearing landscape to the surrounding communities of the area. The forested area is predominately covered with ponderosa pine, a valuable merchantable timber source. Harvesting the pine over time in this area has led to an extensive network of roads across the Forested landscape. Spruce, aspen other hardwoods and meadows also occur in the landscape. In combination with active management, fire has played a key role, shaping the landscape into a vegetative mosaic.

A limited amount of ranching occurs within the project area. The ranch lands, including some grazing allotments on the Forest, can be described as lands with dispersed meadows intermingled with stands of aspen, some birch and pine overstories. Ranching is part of the cultural heritage of the area, and range improvements are accepted as components of the valued landscape character unit.

The landscape has also been influenced by the development of the historic mining districts. Mining remnants can be found throughout the project area. Mine shafts, flumes, cabins and other relics are scattered about. The area surrounding Lead and Deadwood is thought to have the greatest variety of ores and in larger quantities than any other place in the world.

The Forest serves as a backdrop for the communities within and adjacent to the project area. These include Sturgis, Lead, and Galena. There are also subdivisions of these communities in proximity to the project area, which is a patchwork of Forest system lands and private lands. Some of the private lands are vacant property, while other parcels are used for residential or business purposes.

This area provides several recreation opportunities. In the winter the area serves as a winter playground for snowmobile riders and skiers. During the summer visitors enjoy hiking, camping, horseback riding. During the fall the project area receives heavy use from hunters. The unique Sturgis Motorcycle Rally draws thousands of tourists and ‘bikers’ who enjoy sightseeing in the Forest.

Land Use Patterns

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The Forest serves as a backdrop for the communities within or adjacent to the project area. This includes Sturgis, Lead, and Galena. There are also subdivisions of these communities that are in proximity to the project area. The project area is a patchwork of Forest system lands and private lands. Some of the private lands are vacant property, while other parcels are used for residential or business purposes.

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Scenery Enhancement Opportunities

There are stands in the project area with heavy pine encroachment. There is an opportunity to remove the pine to restore the hardwood stands. This type of treatment could be encouraged adjacent to private lands and homes as well as in primary travel corridors.

The project area also includes some stands experiencing a pine beetle epidemic. There is an opportunity to reduce the risk of spread of the beetle into other stands within the project area in order to help preserve the current landscape character. Implementing vegetative treatments could do this.

Primary Travel Routes

The project area is most visible from the following primary travel routes:

State Highway 85

Forest Highway 26 Vanocker

FDR 137.1 Wonderland Cave

FDR 180.1 Erikson

FDR 151.1 Wanhonen

FDR 176.1 Crook City

FDR 170.4 Galena/Vanocker

FDR 168.1 Crystal Cave

FDR 168.3 Crystal Cave

FDR 534.1 Sunny Side

[See Figure 3]

Elements of the Scenery Management System

Information regarding various inventories of the Scenery Management System within the project area is illustrated below. Some of the inventories were done at different levels than others. For example some inventories include ratings for private lands, while most do not. This inconsistency has led to the acreage information for the inventories to be inconsistent. All acreage figures are approximations.

Scenic Attractiveness

Scenic Attractiveness ratings display the relative scenic value of lands within a particular Landscape Character. The three scenic attractiveness classes are:

Class A- Distinctive; Class B- Typical; Class C- Indistinctive.

The landscape elements of landform, vegetation, rocks, cultural features and water features are considered when determining each of these classes.

The following acreages are approximations within the project area

Class A -18, 280 Acres

Class B- 23,708 Acres

Class C- 140,400 Acres

Visual Absorption Capability

Visual Absorption Capability (VAC) analyzes the physical factors of the land and determines their ability to absorb potential landscape alterations. The VAC classes are

1= High ability to absorb change

2= Moderate ability to absorb change

3= Low ability to absorb change

The following acreages are approximations within the project area.

1= High 35,311

2= Moderate 14,090

3= Low 60

Landscape Visibility

Portions of landscapes visible from travelways and use areas are important to Forest visitors for their scenic quality, aesthetic values, and landscape merits. Roads located within and adjacent to the Black Hills were categorized into primary, secondary and primitive concern areas and then rated for the users interest in the views from these areas. Seen area 1- areas with a high concern for scenery. Seen area 2- areas with moderate concern for scenery, Seen area 3- areas with low concern for scenery. The following acreages are approximations within the project area.

Seen 1- 36,690
Seen 2- 27,246
Seen 3- 3,370

Recreation Opportunity Spectrum

The Recreation Opportunity Spectrum provides a framework for defining classes of outdoor recreation environments, activities and experience opportunities. There are six classes of settings, which provide different activities and experiences. The project area contain three of these classes:

Semi-primitive Non-Motorized (SPNM) settings have subtle modifications to the landscape.

Semi-primitive Motorized (SPM) settings may have obvious modifications to the landscape, but they do not attract attention of visitors in vehicles.

Roaded Natural (RN) settings may have modifications to the landscape that are easily noticed and may dominate the landscape.

The following acreages are approximations within the project area.

SPNM 4,470
SPM 35,240
RN 9,760

Scenic Classes

Scenic classes represent the relative landscape value by combining Distance Zone, Concern Levels, and Scenic Attractiveness inventories.

Generally scenic classes 1-2 have high public value, Classes 3-5 have moderate value. The following acreages are approximations within the project area.

Classes 1 & 2: 185,688 Acres
Classes 3 & 4: 17,454 Acres

Scenic Integrity

Scenic Integrity is a measure of the degree to which a landscape is visually perceived to be “complete”. The highest scenic integrity ratings are applied to landscapes that have few if any noticeable deviations from the natural landscape. Areas rated as moderate appear slightly altered, and Low ratings appear moderately altered. Landscapes that appear heavily altered are classified as Very Low. The following acreages are approximations within the project area.

High- 15,840
Moderate- 104,390
Low- 28,610
Very Low- 1,080

Environmental Consequences:

Alternative 1 No Action

Direct Effects:

Under this alternative, the stands with a high risk for attack from pine beetles would not be treated. Spread of the pine beetle into currently unaffected stands both within and outside of the project area could occur. These stands would experience a high mortality rate. The landscape could become saturated with dead and dying trees due to the beetle epidemic. The rust colored trees are a sign of unhealthy timber. This would lead to an undesirable recreation setting for Forest visitors by negatively affecting the scenic resources.

The project area has several major roads running through it, and also provides a backdrop for a variety of communities. The scenic quality of these backdrops could be dramatically altered if an epidemic occurred.

Indirect Effects:

Widespread impacts of a beetle infestation would be detrimental to visual quality in the short-term to an extent beyond the analysis area. In the long term, additional species and structural changes in the vegetative canopy may increase visual quality.

Alternative 2 (Modified Proposed Action)

The modified proposed action is designed to move the project area from the existing condition towards the desired future conditions as described in the revised Forest Plan and to meet the purpose and need described in Chapter 1 of this DEIS. The proposed action emphasizes commercial and non-commercial thinning to reduce the current risk of mountain pine beetle infestation and wildfire risk. Fuel treatments to reduce fire hazards near private homes and establish some roadside fuel breaks in cooperation with partner fire-management agencies. Enhancement of hardwoods would occur in some areas. The hardwoods would be maintained or enhanced by removal of encroaching conifers. These activities would be concentrated near private lands and homes. Sanitation cutting would treat stands currently infested with mountain pine beetle. This treatment would reduce mountain pine beetle populations in the local area. In some stands, trees would be selected as a site to place pheromone bait to lure beetles to these trees. The baiting would be done to increase the effectiveness of sanitation cutting.

Creating shaded fuel breaks would reduce the threat and severity of wildfire. Areas in proximity to private lands would be emphasized for treatment. Overstory trees would be thinned 15-20 feet between the crowns and the understory conifers would be removed. Surface fuels would also be removed or intensively treated. The remaining conifers

would have the branches pruned up to 10 feet from the ground. The fuel break corridors would average approximately 200 feet on each side of the roadway. Prescribed fire would also be used to reduce fuel loading.

As an initial proposal, the proposed action was designed to act on known public sentiment and preliminary environmental issues. Through broad-based public review, participation, and commentary, it has been refined to better reflect current public priorities and incorporate additional environmental controls.

Alternative 2 proposes to use the following treatment methods:

Table 1 Alternative 2 Treatment Acreages

Treatment	Acres
Commercial Thinning	5,794
Non-commercial Thinning	2,264
Hardwood Restoration	323
Bait and Sanitation Cutting	32
Shaded Fuel Breaks	1,635
Prescribed Burning	339

Transportation Activities

Activities affecting the Transportation system in Alternative 2 include approximately 16.2 miles of new road construction, 26.3 miles of reconstruction and 60.7 miles of decommissioning.

Effects Common to all Action Alternatives

The following treatments would be applied in all action alternatives. The effects will vary by alternative based on the number of acres treated and the location of the treatment.

Commercial and Non-commercial Thinning

Thinning is proposed in both alternatives where the primary product removed is saw-timber. The method is usually thinning from below to remove suppressed, defective, and excess stems. After treatment the trees remaining would have basal area between 40-80 BA.

Direct effects from commercial thinning to visual resource result in increased growth and vigor of the stand

Thinning medium to high stocked stands helps to reduce risk of insect and disease problems. The healthier the forest stands are, the better they appear visually.

[See Figure 4]

Shaded Fuel-breaks

Fuel-breaks would be used to reduce fire hazards by changing the type, amount, or arrangement of potential fuels. The post treatment basal area would be 50 BA on average, and higher in areas with Goshawk concerns.

These treatments would affect the scenic resources and visitor experience by opening up stands with thick understory vegetation, providing more visual depth into the forest.

Roadside fuel-break treatments would create a park like setting along the road corridors.

[See Figure 5]

Prescribed Burning

Prescribed burning would occur as a fuel reduction tool in units 4 and 6 of compartment 82101.

Short-term direct effects from prescribed burning include the presence of black and charred vegetation. This effect is overcome within one year, and would have only a short-term effect on forest visitors.

This fire treatment is used to maintain the open stand characteristics of Ponderosa Pine. When aspen is present in the stand, burning would enhance the aspen regeneration.

[See Figure 6]

Hardwood Restoration

Enhancement of hardwoods would occur in some areas. The hardwoods would be maintained or enhanced by removal of encroaching conifers. This treatment would enhance the hardwood component providing more color and textural diversity in the landscape.

Sanitation Cutting and Baiting

These activities would be concentrated near private lands and homes. Sanitation cutting would treat stands currently infested with mountain pine beetle. This treatment would reduce mountain pine beetle populations in the local area. In some stands, trees would be selected as a site to place pheromone bait to lure beetles to these trees. The baiting would increase the effectiveness of sanitation cutting. By removing as much of the beetle brood

as possible, in the long-term, these treatments would sustain the landscape character of the area.

Effects of Transportation Activities Common to all Action Alternatives

New Construction and Reconstruction

New road construction is an investment in construction of a road resulting in a new road corridor. Road reconstruction is defined as an activity resulting in improvement or realignment of a road. If the mitigation measures included in this analysis are applied to new road construction and reconstruction, the new roads would meet the adopted scenic integrity objectives of the Forest Plan.

Decommissioning

Decommissioning is defined as activities resulting in the stabilization and restoration of unneeded roads to a more natural state. There are five levels of decommissioning, ranging from road being 1) blocked 2) re-vegetated 3) culverts removed 4) unstable fills removed or 5) roadbed re-contoured. Almost all roads proposed for decommissioning in the action alternatives are non-system “two track” roads developed through public use over time. Decommissioning roads would lead to a more natural landscape character over time as the roadbed revegetates.

Alternative 3: Wildlife Emphasis

This alternative addresses the purpose and need of the project while emphasizing wildlife habitat improvements. Less thinning is proposed than the modified proposed action in order to provide for more structural stage diversity in the project area. These goals would be accomplished by improving existing meadow conditions through removal of encroaching conifers and prescribed burning where practical. Creating open stand conditions on south aspects, and retaining dense stand conditions on north slopes would maintain wildlife habitat. Prescribed fire would be used in open stands on south and west aspects. Heavy thinning in some stands would provide more grass/forb habitat and future large tree habitat.

Table 2 Alternative 3 Treatment Acreages

Treatment	Acres
Commercial Thinning	4,437
Non-commercial Thinning	2,219
Hardwood Restoration	323
Bait and Sanitation Cutting	0
Shaded Fuel Breaks	1,635
Prescribed Burning	874
Meadow Enhancement	170 *
Meadow Enhancement and Prescribed Burning	59 *

Patch Cutting	(Acres to be determined in the field)*
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*These treatments apply only to this alternative

Effects to scenic resources from Meadow Enhancement Treatments

Pine encroaching on natural meadows can be removed to enhance meadow vegetation.

Effects to scenic resources include enhancing the vegetative mosaic by retaining and improving the meadows by removing encroaching pine. This would add spatial variety to the stands and modify the form of the stands and meadows. Prescribed burning may be applied in some of the meadows to improve wildlife forage. The charred vegetation would have a short-term effect on scenic resources.

Patch Cut (PC) Wildlife Habitat Prescription

The intent of this prescription is to create habitat diversity within monocultures of young regenerating pine stands. Treatments include removing all trees in areas of 2-10 acres within given treatment stand, with some stands receiving more than one patch cut. Treatment of residual slash in patch cuts would include one or more of the following applications: lop and scatter, pile and burn, or prescribed burn. Effects to scenic resources from the application of this treatment include the following:

- The continuous forest canopy in the areas this would be applied to would be broken up with the patch cuts, creating more variety in the landscape.
- The majority of stands where the treatment would be applied are old plantations having little structural diversity. The patch cuts would help create more horizontal diversity in the stands, providing additional vegetative variety to the landscape.
- Patch cuts in stands 081505006, 081505067, 81506047 and 815060020 may be visible in the foreground from primary road 168.3.

Transportation Activities

Activities affecting the Transportation system in Alternative 3 include approximately 11.5 miles of new road construction, 23 miles of reconstruction and 62 miles of decommissioning.

Alternative 4: Wildland Urban Interface Emphasis

Alternative 4 incorporates all of the treatments in Alternative 2. Thinning more small diameter pine stands in the wildland urban interface fire management zones would further reduce the spread of fire and decrease the risk of losing habited structures. This

alternative proposes to decommission fewer roads than in the modified proposed action in order to maintain those roads for future fire control efforts.

Table 3 Alternative 4 Treatment Acreages

Treatment	Acres
Commercial Thinning	6,034
Non-commercial Thinning	2,347
Hardwood Restoration	323
Bait and Sanitation Cutting	32
Shaded Fuel Breaks	1,635
Prescribed Burning	874

Transportation Activities

Activities affecting the Transportation system in Alternative 4 include approximately 16.2 miles of new road construction, 26.3 miles of reconstruction and 55.9 miles of decommissioning.

Cumulative Effects

The cumulative effects analysis area for this resource is the project area, including both National Forest System lands and those under other ownership.

Past management activities have created a mosaic of forested areas interspersed with meadows and some pockets of hardwoods and spruce providing diversity in the landscape.

Since there are no regulations for scenic resource management on private lands, the effects of ongoing private development adjacent to Forest lands can sometimes have negative effects on scenic resources of the continuous landscape. When activities on private land are designed to limit impacts to scenic resources, the differences between private lands and Forest lands are less noticeable.

Past, Present and Reasonably Foreseeable Future Actions

Boomer Timber Sale EA 2000

The acres treated are estimated at 600-700 acres. The treatments included shelterwood prep cuts, seed cuts and overstory removal. Commercial thinning, POL thinning and group selection treatments were also done. Some areas received special cuts, removing the pine to enhance hardwood stands. This project included Boomer Gulch, Strawberry Creek, and Bear Butte Creek, which are also found within the Mineral project area.

Grizzly Gulch Fire, Aug 2002

This wildfire affected approximately 12,000 acres on Bureau of Land Management (BLM), FS, and private lands. Approximately 1,980 acres affected BLM in Exemption Area. Some acres had salvage/hazard salvage on BLM.

Grizzly Gulch Fire-Salvage and Hazard Tree Removal- 2002-ongoing

This is a BLM Project to remove dead trees killed in the 2002 Grizzly Gulch Fire. This is occurring on BLM lands adjacent to main road up Spruce Gulch to top of ridge, estimated 5 miles, and harvesting dead trees within reach of the road or within tractor slope. Acres salvaged are estimated at 300-600 acres.

Reasonably Foreseeable Activities

Minerals Timber Sale EA—2003

Both the Mineral project and the Elk Bugs and Fuels project would impact Bear Butte Creek and its tributaries. Planned activities in proximity to Highway 385 for this project coincide with past activities of the Boomer Timber Sale.

Legislated Activities

Legislated activities within the project area include non-commercial treatments in the Forbes Gulch area and fuel breaks along the boundaries inside of Beaver Park. Approximately 3,372 acres of activities would occur outside of the project boundary.

Legislated Activities outside of the Project Area

The legislated activities directly south of the project area are visible from primary travel routes FH 26 and FDR 151.

- The majority of activities outside of the project area would occur in Moderate and Low scenic integrity objectives.
- Few of the activities occur in scenic class 3 (moderate concern for scenery), with the majority falling into scenic class 2 (high concern for scenery).
- These activities occur in all of the visibility levels.
- Almost all of the activities occur in the High visual absorption capability class, which can withstand more changes to the landscape than the other classes.
- Almost all of the activities occur in the semi-primitive motorized ROS class.

Effects from the Cumulative Activities

The Grizzly Gulch Fire has left patches of burned timber in the landscape across the Forest starting east near Bear Den Mountain, continuing west to the outskirts of Lead and Deadwood. Some of the standing dead trees are being removed by salvage projects; however there would be remnants of burned trees in this area over the long-term.

A concentration of timber harvesting activities would occur between Strawberry Picnic Area on Highway 385 and FDR 534. This would include the past timber treatments from

the Boomer Timber Sale and the proposed activities from the Minerals project. If the mitigation measures identified to reduce impacts to scenic resources are implemented for both projects, the cumulative impacts to scenery in this area would meet the Forest Plan. However, if the mitigations are not adhered to the adopted scenic integrity objective of High may not be met.

The combined effects from the cumulative impacts with implementation of any action alternative would not adversely affect scenic resources.

Summary of Effects

Scenic Classes

Scenic Attractiveness and Landscape Visibility are components of Scenic Classes. Therefore, the description of scenic classes addresses these scenery management components. Scenic classes 1-2 are landscapes that have been rated as areas of high public concern for scenery. Alternative 4 treats the most amount of areas of scenic classes 1-2 with 6,056 acres. Alternative 2 treats 5,520 acres followed by Alternative 3 treating 5,514 acres. The legislated activities add an additional 2,210 to any alternative. Scenic classes 3-5 are landscapes that have been rated as areas of moderate public concern for scenery. Alternative 4 treats 4,700 acres, Alternative 3 treats 3,235 acres and Alternative 2 treats 2,980 acres.

Scenic Integrity Objectives (SIO)

Areas with a High SIO are naturally appearing landscapes. The amount of acres proposed for treatment in the High SIO differs by 150 acres across alternatives. Alternative 4 treats the most with 2,150 acres, followed by Alternative 3 with 2,020 acres, and Alternative 2 proposing 2,000 acres of treatment. An additional 630 acres will be treated under the legislated activities. The activities proposed in High SIO will likely change these areas to a moderate SIO.

Areas with a Moderate SIO appear slightly altered to the Forest visitor. The amount of acres proposed for treatment in the Moderate SIO are greatest in Alternative 4, followed by Alternative 3 and 2 respectively. Implementation of these proposed activities will likely result in retaining the Moderate SIO.

Areas of Low SIO appear moderately altered. The majority of proposed activities occur in Alternative 2, followed by 4 and 3 respectively. The proposed activities would not change the SIO level.

Landscapes that appear heavily altered are classified as Very Low. Alternative 2 proposes to treat 440 acres in this SIO. The other alternatives would treat one acre of Very Low SIO. The proposed activities would not change the SIO level.

Visual Absorption Capability

Visual Absorption Capability (VAC) is the ability of the landscape to camouflage changes based on the natural landscape character. High VAC areas can withstand the most changes and still appear natural, while in areas of Low VAC, changes in the landscape will be apparent to Forest visitors.

Only 12 acres of treatments are proposed in Alternatives 2 and 4, and none in 3. Alternative 4 proposes to treat 3,930 acres of Moderate VAC, Alternative 2 proposes 3,780 and Alternative 3 treats 3,780 acres. Activities proposed in High VAC cover 7,290 acres in Alternative 4, 7,040 acres in Alternative 3, and 6,580 acres in Alternative 2.

Recreation Opportunity Setting (ROS)

Semi-primitive Non-Motorized (SPNM) settings have subtle modifications to the landscape.

Semi-primitive Motorized (SPM) settings may have obvious modifications to the landscape, but they do not attract attention of visitors in vehicles. Roded Natural (RN) settings may have modifications to the landscape that are easily noticed and may dominate the landscape.

Proposed activities in SPNM are greatest in Alternative 3 treating 850 acres, followed by Alternative 4 proposing 762 acres and Alternative 2 treating 730 acres. Activities such as road building and skid trails may convert this ROS class to SPM.

The majority of proposed activities occur in the SPM setting. Alternative 4 treats 8,280, alternative 2 treats 7,530, followed by Alternative 3 treating 7,470 acres. The proximity of new roads to the SPM areas may convert the to roded natural ROS.

The proposed activities in the roded natural class include Alternative 3 treating 2,280 acres, followed by Alternative 4 treating 2,190 and Alternative 2 treating 2,120 acres. These activities would maintain the ROS class.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

No irreversible or irretrievable commitments of scenic resources would occur with implementation of any action alternative.

Heritage Resources

Affected Environment:

Introduction

Between September and November of 2002, Level 1 and 3 heritage resource inventories were conducted on 18,633 acres of the Elk Bugs and Fuels planning area. Forty-nine previously unrecorded heritage resources were located. These included fifteen prehistoric, thirty historic, three multi-component, and one rock shelter. Five of the forty-nine are considered eligible (Class I) and one is considered potentially eligible (Class II) for nomination to the National Register of Historic Places (NRHP). One of the sites that is not considered eligible for nomination is a grave, which is provided protection under South Dakota state law and will be avoided as though it were a Class I site. Previous projects in the area had inventoried and recorded 290 heritage sites, but only thirty-three of these sites were within the boundary of the current survey project. Of the thirty-three, eight of the previously recorded heritage sites are considered eligible and three of the previously recorded heritage sites are considered potentially eligible to the NRHP.

Some areas surveyed may not be selected for treatment, however, no treatments will occur outside of surveyed areas. Should additional treatments be planned within the Elk/Bug Planning Unit, which do not fall within areas previously surveyed, heritage inventory and reporting will precede project implementation.

Mandatory Legislation

The National Historic Preservation Act of 1966, as amended, provides specific guidance to federal agencies that must consider potential effects to heritage resources as part of the agencies' management activities. These guidelines or protocols are found in Section 106 of 36 CFR 800. Federal agency heritage programs are also mandated by policies and standards set forth in the National Environmental Policy Act of 1969; Executive Order 11593 of 1971; Archaeological Resource Protection Act of 1979; the American Indian Religious Freedom Act of 1978; Native American Graves Protection and Repatriation Act of 1990; and Executive Order 13175 of November 2000.

Resource Protection Measures

The Black Hills National Forest (BHNF) manages and protects heritage resources on public land for the purpose of public interpretation, cultural importance to Native American Indians or other cultural groups, and for scientific research. Under Section 106 of the National Historic Preservation Act (NHPA), heritage properties are evaluated for their significance of "eligibility" for nomination to the National Register of Historic Places. Potential effects to sites evaluated as eligible, potentially eligible, and Traditional Cultural Properties must be considered. Protection or mitigation treatments are used to avoid or reduce adverse affects.

A standard measure for the protection of heritage resources is intensive field inventory and site identification prior to the implementation of land management projects.

Mitigation or protection measures such as site avoidance, capping or plating site surfaces, and altering adverse effects, are possible in consultation with the State Historic Preservation Office, interested Native American Tribes, and other applicable interested parties. Effects to sites can also be reduced or minimized through archaeological recordation, structure recordation, interpretation, increased monitoring, and restrictive covenants.

Environmental Consequences:

Effects on Heritage Resources from Timber Harvest

Timber management will result in various degrees of soil disturbance. Timber harvesting, skid trails, temporary road use, landings, movement of equipment, and piling and disposal of slash piles can adversely affect heritage resources. In comparing the alternatives, Alternative 4 would disturb the greatest number of acres, followed by Alternative 2 and 3. Alternative 1 would result in no ground disturbance. As the amount of potential ground disturbance increases, the potential for disturbance and adverse effect to heritage resources also increases.

Under Alternatives 2, 3 and 4, disturbance to heritage resources would be minimized through identification and avoidance or mitigation measures. The Forest would be in compliance with Section 106 of the National Historic Preservation Act under each alternative if appropriate avoidance or mitigation measures are implemented.

Effects on Heritage Resources from Fuel Reduction

Fire management treatments will result in various degrees of soil disturbance. Timber and underbrush removal, mulching, skid trails, temporary road use, landings, movement of equipment, and piling and disposal of slash piles can adversely affect heritage resources. Additional affects to heritage resources occur with low, moderate and high intensity burn activities. In comparing the alternatives, Alternative 4 would disturb the greatest number of acres, followed by Alternative 2 and 3. Alternative 1 would result in no ground disturbance. As the amount of potential ground disturbance increases, the potential for disturbance and adverse effect to heritage resources also increases.

Under Alternatives 2 and 3, disturbance to heritage resources would be minimized through identification and avoidance or mitigation measures. The Forest would be in compliance with Section 106 of the National Historic Preservation Act under each alternative if appropriate avoidance or mitigation measures are implemented.

Effects on Heritage Resources from Roads

Heritage resources can be adversely affected by road construction and reconstruction activities. Adverse effects also occur under certain conditions through use of temporary roads, road maintenance, closures, and road decommissioning activities. Effects to heritage resources are of particular concern where two-track roads are subject to

maintenance and use as temporary roads. In most cases mitigation measures which use barrier cloth and additional material fill can reduce damage to heritage resources.

In a review of the Alternatives considered, Alternative 2 and 4 will result in the greatest number of miles of road and hence have the greatest potential to affect heritage resources, followed by Alternative 3. Alternative 1 will result in the lowest potential to effect heritage resources.

Alternatives 2, 3, and 4 contain areas planned for road construction, road reconstruction and road decommissioning activities, which have the potential to adversely affect historic properties, which are considered eligible for nomination to the NRHP. The Forest would be in compliance with Section 106 of the National Historic Preservation Act under each alternative if the appropriate mitigation measures are implemented.

Cumulative Effects

Forseeable Future Actions

Effects on heritage resources may occur from snag removal along fences; range improvements; private land boundaries; power lines; new road access; and survey monuments. If the removal of snag trees is conducted by hand felling techniques and not removed by mechanical means from their drop site, there will be no effect to heritage resources.

There will be little or no effect to heritage resources by these undertakings provided that eligible and potentially eligible sites, Traditional Cultural Properties, and culturally significant areas are avoided or have mitigations developed and implemented in consultation with the State Historic Preservation Office, Native American Tribes, and any other applicable interested parties.

This project, in combination with other Forest activities such as timber harvesting, recreation, and range activities, may have a cumulative effect on heritage resources in the form of increased soil erosion, increased visitor traffic and vandalism and alteration of historic landscapes. Cumulative impacts of these types are difficult to quantify but may be avoided or minimized through the implementation of appropriate, site-specific treatments, when deemed necessary through the consultation process with the SHPO and the Advisory Council on Historical Presentation (ACHP).

Conclusions

When an alternative is selected, those sites which still fall within areas of potential effect will either be marked on the ground and excluded from all project impacts or impacts to the site will be mitigated depending upon the SD SHPOs response to mitigation proposals. No impacts to the site will occur prior to consultation with the SD SHPO.

Economics

Economic Efficiency Analysis

The main criteria in assessing economic efficiency is Present Net Value (PNV), which is defined as the value of discounted benefits minus discounted costs. A PNV analysis includes all outputs to which monetary values are assigned, including both market and non-market values. In addition, a financial efficiency analysis determines the financial revenues of each alternative. A financial efficiency analysis is the PNV of revenues and costs. The figures generated by economic analysis of land management projects are usually used as means to compare alternatives.

The output of non-market goods such as recreation, for the project area is not expected to change appreciably in any of the alternatives, so the economic efficiency analysis is the same as the financial efficiency analysis for all alternatives. Non-market factors, such as wildfire risk, are difficult to determine and were not included in this analysis.

The economic analysis was generated using Quick Silver, a Forest Service economic analysis program customized for the Rocky Mountain Region. The financial values used are from Black Hills National Forest cost guides based on experienced costs and revenues. Present net value and benefit/cost ratios are displayed in the following table.

Table 4 Present Net Value and Benefit/Cost Ratio by Alternative

Measure	Alt. 1	Alt. 2	Alt. 3	Alt. 4
Present Net Value	\$0	-\$725,978	-\$2,307,134	-\$1,481,003
Benefit/Cost Ratio	NA	0.69	0.34	0.53

The economic values generated by the Quick Silver analysis are used as a means to compare alternatives, rather than as an absolute measure. This is done because timber prices tend to fluctuate widely. Actual economic values vary with market conditions and will be determined at the time the timber is sold.

Cumulative Effects

The cumulative effects analysis area for economics includes the counties overlapping the National Forest: Lawrence, Meade, Pennington, Custer, and Fall River Counties in South Dakota; and Crook and Weston Counties in Wyoming.

The Black Hills area economy was dominated by mining, timber harvest, and agriculture for many years. The region's economy is now well diversified (USDA Forest Service, 1996). Major employer Homestake Mine closed at the end of 2001; Homestake's underground mine may be converted into a physics laboratory, predicted to employ many, but this is not yet certain. Another major employer in the northern Black Hills, Pope and Talbot Inc., shut down its Spearfish sawmill for several weeks in 2001 due to

low timber prices. The future of some operators in the highly competitive forest products industry is uncertain.

The proposed actions in Alternatives 2, 3, and 4 would contribute to the local economy by producing forest products and employment, and through procurement of services and products associated with project implementation. The level of sawtimber harvest is below that of the other timber sales conducted in the project area over the last 10 to 15 years, due both to new, more restrictive management direction and to the recent level of harvest itself. This project area has perhaps been more intensively managed than many others in recent years, but if timber harvest levels fall substantially across the forest it is reasonable to assume that the forest products industry would be forced to adjust.

Environmental Justice

A specific consideration of equity and fairness in resource decision-making is encompassed in the issue of environmental justice. As in Executive Order 12898 (Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations), all Federal actions will consider potentially disproportionate effects on minority or low-income communities. Consideration of environmental justice issues should be highlighted for decision makers. Potential impacts or changes to low-income or minority communities in the project area due to the Proposed Action should be considered. Where possible, measures should be taken to avoid impact to these communities or mitigate adverse effects.

Within the project area, there are no communities with significant low-income or minority populations, so specific actions to address environmental justice concerns were not implemented for this project.

Short-term Uses and Long-term Productivity

NEPA requires consideration of “the relationship between short-term uses of man’s environment and the maintenance and enhancement of long-term productivity” (40 CFR 1502.16). As declared by the Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA Section 101).

Short-term uses are those expected to occur on the Forest over the next ten years. These uses include, but are not limited to recreation use, grazing, timber harvest, and prescribed burning. Long-term productivity refers to the capability of the land to provide resource outputs for a period of time beyond the next ten years.

The minimum management requirement established by regulation (36 CFR 219.27) provides for the maintenance of long-term productivity of the land. Minimum management requirements prescribed by the forest-wide standards and guidelines assure that long-term productivity of the land will not be impaired by short-term uses.

There is a need to restrict the potential of an insect outbreak in order to manage these stands to minimize volume losses due to insect and disease or other damage agents. Pine beetle epidemics can result in changes that radically alter conditions within a landscape.

Short-term uses include thinning and burning of timber and disturbance of land surface for skid trails. These areas would be returned to vegetation cover and would not reduce long-term productivity.

Unavoidable Adverse Effects

The application of standards and guidelines, listed mitigation measures and application of the Region 2 Watershed Conservation Practices and South Dakota Best Management Practices, would limit the extent and duration of any potential adverse environmental effects. For detailed disclosure of all effects, including unavoidable adverse effects, see the preceding Environmental Consequences discussions for each resource area. Mitigation and monitoring are in place to minimize impacts to the various resources.

Irreversible and Irretrievable Commitments of Resources

Irreversible commitments of resources mean that nonrenewable resources are consumed or destroyed. Examples include the extinction of a species or the removal of mined ore, and the destruction of such things as heritage resources by other management activities. None of the proposed actions are expected to result in irreversible commitments of resources.

Irretrievable commitments are those that are lost for a period of time such as the loss of timber productivity in forested areas that are kept clear for use as a power line right-of-way or road. New road construction in alternatives 2, 3, and 4 would represent irretrievable commitments of resources.

Heritage resources will be impacted by the proposed project, but the loss is limited to sites ineligible sites to National Register of Historic Places, or the effect is considered to not affect those characteristics of a site that make it important. The project complies with Section 106 of the National Historic Preservation Act.

Cumulative Effects

Refer to the cumulative effects in the Environmental Consequences section of this document for detailed descriptions of cumulative effects by resource area.

Other Required Disclosures

NEPA at 40 CFR 1502.25(a) directs “to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently and integrated with ...other environmental review laws and executive orders.”

The US Fish and Wildlife Service has not been consulted under the Fish and Wildlife Coordination act for water impoundment or diversion because those activities are not proposed.

National Historic Preservation Act requirements have been met for the project and it has been cleared with the State Historic Preservation Office.

U.S. Fish and Wildlife Service and the National Marine Fisheries Service in accordance with the ESA implementing regulations for projects with threatened or endangered species have not been consulted for this project. No threatened or endangered amphibian, fish, or plant species occur within the project area. However, bald eagles (*Haliaeetus leucocephalus*) are the only federally listed (threatened) species occurring in the project area. They are frequent winter migrants within the planning unit; no nesting is known to occur within the Black Hills National Forest.

With relation to national and global petroleum reserves, the energy consumption associated with the individual alternatives, as well as the difference between, is insignificant.

