

# Cement Environmental Assessment

## ADDITIONAL INFORMATION

This document contains information not available at the time the Cement Environmental Assessment (EA) was finalized.

### **Heritage Resources**

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*This section replaces the direct and indirect effects section of the heritage resources analysis, EA p. 111.*

The project area includes 12 known Class I heritage sites (eligible to the National Register of Historic Places). Four of these sites are in locations that could be affected by proposed activities.

Roads exist in three of the sites. Reconstruction and log hauling are proposed under both alternatives on the roads that cross sites 48CK619 and 48CK624. Mitigation (EA p. 28) would prevent adverse effects due to proposed activities.

Timber harvest is proposed under both alternatives adjacent to sites 48CK624 and 48CK793. Log skidding, landing, and other ground-disturbing activities would be prohibited within site boundaries (see below). Timber harvest is proposed under both alternatives in the stand containing site 48CK1510. The archeological site would be excluded from treatment (see below). Proposed actions, as mitigated, would have no adverse effects.

Non-harvest activities are proposed in site 48CK793. Design criteria for these projects would ensure that ground disturbance does not occur.

Road closures proposed under Alternative 2 and to a lesser extent under Alternative 3 would reduce the potential for damage or looting of other heritage sites by decreasing ease of access.

The Wyoming State Historic Preservation Officer concurred with the determination of No Effect on Nov. 18, 2003 (Case Number 0302TLOL026). The Section 106 process is complete.

*The following heritage resources mitigation measures supplement those on EA p. 28:*

- d) No log skidding, landing, or other ground-disturbing activities would be allowed in site 48CK793. The unclassified road crossing this site would be decommissioned using large rocks or other means that would not involve excavation, ripping, or other ground disturbance.
- e) Site 48CK1510 is located in a proposed commercial harvest unit. This site would be marked on the ground and excluded from harvest and other ground-disturbing activities. Trees adjacent to the site would be cut so that they do not fall into the site.
- f) District or contract archeologists would conduct heritage resource inventories in proposed prescribed burn areas after development of a burn plan. The district would consult with the State Historic Preservation Officer and Tribal Historic

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Preservation Officers and obtain concurrence with determination of effects before implementing the burn.

## **Sensitive Species**

*This section supplements the sensitive species effects analyses, EA pp. 60-82 and 91-96.*

On November 3, 2003 the Rocky Mountain Regional Forester issued an updated list of sensitive species. Effects on most of the species on this list are discussed in the Cement EA (pp. 60-83) and Biological Assessment/Biological Evaluations (BA/BE), located in the project file. Determinations of effects on species new to the list are documented in addenda to the wildlife BA/BE and botany BE and summarized below.

## **Sensitive Wildlife Species**

The following species potentially found in the Black Hills are currently on the Rocky Mountain Region sensitive species list.

<b>Common name</b>	<b>Scientific name</b>	<b>Habitat present</b>	<b>Habitat description</b>	<b>Analysis</b>
American marten	<i>Martes americana</i>	No	Spruce forests with complex near-ground structure extending into adjacent ponderosa pine stands (Buskirk 2002)	None (no habitat) (see EA p. 61)
American three-toed woodpecker	<i>Picoides tridactylus</i>	Yes	Mature spruce forests and burned areas (Panjabi 2003)	EA p. 70
Black Hills redbelly snake	<i>Storeria occipitomaculata pahasapae</i>	Yes	Moist woodlands with adequate cover	EA p. 78
Black-backed woodpecker	<i>Picoides arcticus</i>	Yes	Montane coniferous mature forests	EA p. 68
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>	No	Dry upland prairies	None (no habitat)
Burrowing owl	<i>Athene cunicularia</i>	No	Dry grasslands and pastures, usually associated with prairie dogs or ground squirrels (Tallman et al. 2002)	None (no habitat)
Cooper's Rocky Mountain snail	<i>Oreohelix strigosa cooperi</i>	Yes	Moist environments, hardwoods, spruce or mixed spruce/pine, north & east exposures	EA p. 82
Finescale dace	<i>Phoxinus neogaeus</i>	No	Distribution historically and currently limited to small area in northern Black Hills, primarily Redwater Creek drainage (Evermann and Cox 1986, Baily and Allum 1962, WYNDD 2002). Habitat includes pools of boggy headwaters, creeks and small rivers, lakes and ponds, and often common in beaver ponds usually over silt and near vegetation	None (no habitat)
Flammulated owl	<i>Otus flammeolus</i>	Yes	Open pine forests, montane conifer or aspen forests, often with brushy understories	EA p. 75
Fringe-tailed myotis	<i>Myotis thysanodes</i>	Yes	Hibernates in caves, mines, roosts in crevices and rock surfaces (Tigner and Stukel 2003)	EA p. 77
Grasshopper sparrow	<i>Ammodramus savannarum</i>	Yes	Open grassy and weedy meadows across the US. Primarily found in the Great Plains states	See below

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Common name	Scientific name	Habitat present	Habitat description	Analysis
Lake chub	<i>Couesius plumbeus</i>	No	Once abundant in the Black Hills; is now known from only one lake. Found in standing or flowing water, large or small water bodies, most common in gravel-bottomed pools and runs or streams and along rocky lake margins	None (no habitat)
Lewis' woodpecker	<i>Melanerpes lewis</i>	Yes	Open burned areas with snags; oak and cottonwood forests (Panjabi 2003)	EA p. 69
Loggerhead shrike	<i>Lanius ludovicianus</i>	Yes	Open country with scattered trees and shrubs	EA p. 73
Mountain sucker	<i>Catostomus platyrhynchus</i>	No	Rivers and streams, occurring most often in cool, clear mountain streams with moderate water velocities	None (no habitat)
Northern goshawk	<i>Accipiter gentilis</i>	Yes	Mature & old growth aspen, conifer or mixed stands for nesting. In Black Hills, mature pine stands with >50% canopy cover (Bartelt 1977, Erickson 1987)	EA p. 66
Northern harrier	<i>Circus cyaneus</i>	No	Open grasslands or brushy areas with good residual vegetation (Tallman et al. 2002)	None (no habitat)
Northern leopard frog	<i>Rana pipiens</i>	Yes	Permanent and semi-permanent water sources	EA p. 79
Ottoo skipper	<i>Hesperia ottoe</i>	Yes	Prairie butterfly, most common in mid to tallgrass habitats	See below
Peregrine falcon	<i>Falco peregrinus</i>	Yes	Plains and open areas, nesting on cliffs, canyons or buttes	See below
Regal fritillary	<i>Speyeria idalia</i>	Yes	Shortgrass, mixed grass, and tallgrass prairies	See below
River otter	<i>Lontra canadensis</i>	No	Riparian habitats with fish	None (no habitat)
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	Yes	Depends on caves and mines, may roost on rock surfaces, uses feeding perches (Tigner and Stukel 2003)	EA p. 78
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	Yes	Riparian shrublands, woodlands, and brushy habitat (Haldeman 1980)	EA p. 74

**Ottoo Skipper (*Hesperia ottoe*)**

This butterfly is found in scattered, relatively undisturbed, mixed- to tall-grass prairie habitat (Marrone 2002). It can also be found in oak woodlands and along roadsides (Pyle 1998). It has been documented in Crook County, Wyoming (Struttman, no date). The species is generally rare wherever it occurs. Larval hostplants include native prairie grasses such as little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardii*), and sideoats grama (*Bouteloua curtipendula*). Adults will nectar on a variety of flowers, especially coneflowers (*Echinacea* spp. and *Rudbeckia* spp.), asters (*Aster* spp.), milkweeds (*Asclepias* spp.) and leadplant (*Amorpha canescens*) (Marrone 2002). The Cement project area includes meadows with little bluestem and a wide variety of prairie forbs that may be used as nectar sources. This prairie butterfly has not been documented within the project area, and the area cannot be considered typical habitat.

**Direct effects**

Logging and prescribed burning operations could cause mortality of individual adult butterflies and larvae.

#### Indirect effects

The proposed treatments would have beneficial impacts on this species by creating more open habitat for the establishment of the native larval hostplants. The project may also have beneficial impacts from increases in open-habitat nectaring forbs such as coneflowers, milkweed and asters.

#### Cumulative effects

Habitat on public and private lands within the project area appears stable at this time. Active management would enhance this butterfly's habitat.

#### Comparison of effects by alternative

**Alternative 1 (no action):** Forested habitats would become denser and more mature. Forest would encroach on open habitat needed by this species. Larval hostplants (native prairie grasses) and nectaring forbs would decrease. Wildfire and insect epidemics would benefit this species in the project area.

**Alternative 2:** Proposed treatments would likely have mostly beneficial impacts. Forested habitats in treated areas would become more open, encouraging grasses and forbs. Both mechanical treatments and prescribed burning would increase the carrying capacity for this butterfly across the project area. Logging and prescribed burning operations could cause mortality of individual adult butterflies and larvae.

**Alternative 3:** Similar to Alternative 2; reduced acreage of prescribed burning would result in a smaller increase in habitat diversity and hostplant and nectaring opportunities.

#### Determination

Alternatives 2 and 3 may adversely impact individuals, but are not likely to result in a loss of viability in the Cement project area, nor cause a trend to federal listing or a loss of species viability range-wide. Since this butterfly is a prairie species, and prairie habitat is limited within the project area, effects are theoretical. Overall, proposed treatments would benefit this species.

### **Regal fritillary (*Speyeria idalia*)**

This species occurs primarily in prairie habitats throughout the midwestern States. It generally inhabits wet meadows and tallgrass prairie, but the species also inhabits dry undisturbed prairie areas in western Kansas, Nebraska, South Dakota and eastern Wyoming, Montana, and Colorado (Marrone 2002). The regal fritillary periodically occurs in the Black Hills, although this area is at the periphery of its range (Ferris and Brown 1981). Population information is inadequate and sporadic in the Black Hills. The regal fritillary has been found in prairie habitat in all counties encompassing the Black Hills except Weston County in Wyoming. Larval hostplants include various species of violets (*Viola* spp.). Regal fritillaries nectar on a wide variety of flowers including coneflower (*Echinacea* spp. and *Rudbeckia* spp.), thistle (*Cirsium* spp.), and milkweeds (*Asclepias* spp.) (Marrone 2002). This butterfly has not been documented in the project area, and the area cannot be considered typical habitat.

#### Direct effects

Logging and prescribed burning operations could cause mortality of individual adult butterflies and larvae.

#### Indirect effects

The proposed treatments would have beneficial impacts on this species by creating more open, early seral habitat for the establishment of larval hostplants. The project may also have beneficial impacts from increases in open-habitat nectaring forbs such as coneflowers, milkweed and thistle.

#### Cumulative effects

Habitat on public and private lands within the project area appears stable at this time. Active management would enhance this butterfly's habitat.

#### Comparison of effects by alternative

**Alternative 1** (no action): Forested habitats would become denser and more mature. Forest would encroach on open habitat needed by this species. Larval hostplants (violets) and nectaring forbs would decrease. Wildfire and insect epidemics would benefit this species in the project area.

**Alternative 2:** Proposed treatments would likely have mostly beneficial impacts. Forested habitats in treated areas would become more open, encouraging grasses and forbs. Both mechanical treatments and prescribed burning would increase the carrying capacity for this butterfly across the project area. Logging and prescribed burning operations could cause mortality of individual adult butterflies and larvae.

**Alternative 3:** Similar to Alternative 2; reduced acreage of prescribed burning would result in a smaller increase in habitat diversity and hostplant and nectaring opportunities.

#### Determination

Alternatives 2 and 3 may adversely impact individuals but are not likely to result in a loss of viability in the Cement project area, nor cause a trend to federal listing or a loss of species viability range-wide. Since this butterfly is a prairie species, and prairie habitat is limited within the project area, effects are theoretical. Overall, proposed treatments would benefit this species.

#### **Peregrine falcon (*Falco peregrinus*)**

Peregrine falcons usually inhabit open country, from tundra to seacoasts, mountains, and open forested regions, and are often associated with cliffs and ledges overlooking water sources in areas with an abundance of birds. They may also nest in old nests of ravens or hawks, or on ledges of tall buildings (DeGraff et al. 1991).

This species was delisted by the USFWS in August 1999 and is considered recovered from endangered status in many areas. Current data from monitoring projects in Region 2 suggest that this species' distribution is very patchy with large gaps. The species is listed as imperiled in Colorado, critically imperiled in Wyoming and Kansas, very rare and locally distributed in Nebraska, and extirpated from South Dakota. It is considered a species of concern in Colorado and Wyoming and listed as a state endangered species in South Dakota, Nebraska, and Kansas.

In the Black Hills, the peregrine falcon is an uncommon spring and rare fall migrant and a rare winter visitor (Tallman et al. 2002). Suitable nesting habitat is defined as mainly deep canyons where there are cliffs of limestone or sandstone (Pettingill and Whitney 1965) generally 200-300 feet high that dominate the surrounding landscape (Sharps and O'Brien 1984). The nesting season is May through July (Pettingill and Whitney 1965). Historical records indicate presumed active nests in the Dark Canyon area (Mystic Ranger District) in 1948 and 1956. A juvenile bird was banded there in August 1960 (Pettingill and Whitney 1965). This species has not been documented breeding in the Black Hills since that time. Unconfirmed reports of peregrines nesting in the Spearfish Canyon area exist (Sharps 1979), but details are lacking. An experienced falconer reported seeing a peregrine falcon in Spearfish Canyon in 1989 with subsequent unconfirmed observations in the same unknown locale (Crawford pers. comm. 1995).

This species has not been documented in the Cement project area.

#### Direct effects

Management activities such as prescribed fire could cause mortality of individual juveniles, though this is highly unlikely given the scarcity of preferred habitat.

#### Indirect effects

Suitable habitat would likely increase with proposed treatments. Silvicultural treatments would probably enhance open forest habitat conditions, which may enhance prey detection. Active

management may also increase the diversity of bird, small mammal, and insect species available as prey.

#### Cumulative effects

Past timber sales within and adjacent to the project area removed some dense pine cover. Overall, however, during the last 100 years, fire suppression and forest management have increased the continuity of pine habitat and probably reduced habitat diversity and amount of surface water.

#### Comparison of effects by alternative

**Alternative 1** (no action): Observations throughout the project area suggest that mountain pine beetle numbers are increasing, as is the risk of wildfire. Wildfires would likely be high intensity burns, and large-scale catastrophic burns would be detrimental to falcon prey species and ultimately the falcon.

**Alternative 2:** Forest habitats would become more diverse and less dense. Vegetative diversity would increase. Habitat for falcon prey species associated with open habitat would increase and habitat for falcon prey associated with closed habitat will decrease. Prey diversity and availability may increase. Ease of prey detection would likely increase.

**Alternative 3:** Similar to Alternative 2; reduced acreage of prescribed burning would result in a smaller increase in prey habitat and diversity, patchiness of habitat, and ease of prey detection.

#### Determination

Alternatives 2 and 3 may adversely impact individuals but are not likely to result in a loss of viability in the Cement project area, nor cause a trend to federal listing or a loss of species viability range-wide. Overall, action alternatives would likely have a beneficial impact on this species.

#### **Grasshopper sparrow (*Ammodramus savannarum*)**

The grasshopper sparrow occurs locally in the Black Hills, almost exclusively in native mixed-grass prairies (Panjabi 2003a). This species prefers large grassland areas of intermediate height and is often associated with clumped vegetation interspersed with patches of bare ground (WYNDD 2002). The Wyoming Natural Diversity Database reports that average territory size is small (<2 ha). Other habitat requirements include moderately deep litter and sparse coverage of woody vegetation. The grasshopper sparrow feeds on insects, other small invertebrates, and seeds. Nesting occurs primarily in June and July but may extend into August (Tallman et al. 2002).

WYNDD (2002) reports an observation of this species from July 1988 of a male singing in the Bearlodge Mountains in a hay meadow approximately five miles south of Alva. There are breeding records throughout South Dakota, including the Black Hills (Peterson 1995), and the species is considered a locally common migrant and summer resident (Tallman et al. 2002). This species was reported breeding on the Forest in 2001 (Panjabi 2001) and 2002 (Panjabi 2003a) but not in 2003 (Panjabi 2004 [draft]). Panjabi (2003a) reported this species appeared to be more abundant in 2002, possibly due to drought conditions that reduced suitable nesting sites off of the Forest.

Habitat decline for this species is attributed to cultivation, urban sprawl, and reforestation, compounded by losses incurred as a result of habitat mowing and subsequent predation (USDA Forest Service 2003). Keys to management are providing large areas of contiguous medium-height grassland with moderately deep litter cover and low shrub density (Dechant et al. 2001b). Most habitat within the Cement project area is unsuitable for this species. Any occurrences are probably accidental.

#### Direct effects

None anticipated.

#### Indirect effects

Suitable habitat would likely increase with proposed treatments. Silvicultural treatments would enhance open forest conditions, to the benefit of this sparrow.

#### Cumulative effects

Past timber sales within and adjacent to the project area removed some dense pine cover, which would benefit this species at least temporarily. Overall, however, during the last 100 years, fire suppression and forest management have increased the continuity of pine habitat, and probably reduced suitable habitat for this bird.

#### Comparison of effects by alternative

**Alternative 1** (no action): Habitat would become denser in time, reducing preferred habitat for this bird. Foraging and nesting habitat would depend on natural increase of mountain pine beetle and stand-replacing wildfires. Observations throughout the project area suggest that mountain pine beetle numbers are increasing, as is the risk of wildfire.

**Alternative 2:** Proposed treatments would likely have beneficial impacts. Forested habitats would become more open and hardwood stands would be enhanced, providing nesting and foraging opportunities. Prescribed burns would increase foraging opportunities as insects increase for five to six years post-treatment (Cerovski 2002).

**Alternative 3:** Similar to Alternative 2; reduced acreage of prescribed burning would result in a smaller increase in habitat diversity, patchiness of habitat, and foraging opportunities.

#### Determination

Most of the project area is not suitable grasshopper sparrow habitat. In areas that are suitable, proposed treatments would likely have beneficial impacts

## Sensitive Plant Species

Black Hills plant species added to the Rocky Mountain Region Sensitive species list include:

- Blue columbine (*Aquilegia brevistyla*)
- Bristlystalked sedge (*Carex leptalea*)
- Highbush cranberry (*Viburnum opulus* var. *americanum*)
- Leathery grapefern (*Botrychium multifidum*)
- Prairie moonwort (*Botrychium campestre*)
- Sage willow (*Salix candida*)
- Yellow lady's-slipper (*Cypripedium pariflorum*)

Though these species were not on the Sensitive species list at the time botanical surveys were conducted for this project, surveyors recorded all unique species regardless of rank or status. Surveys were conducted in habitat suitable for these species where it exists in the project area.

## Species Known to Occur in Project Area

**Blue columbine:** This species occurs throughout most of northern Canada and southern Alaska, with disjunct occurrences in parts of southern British Columbia and Saskatchewan and in Montana and the Black Hills. There are 50 known occurrences in the Black Hills. In 2003, baseline monitoring data was collected for 18 of these occurrences. Baseline data is scheduled to be collected for the remaining sites in 2004.

Two unconfirmed occurrences of blue columbine have been found in the project area, both in birch/hazelnut habitats. Both of the potential occurrences are outside proposed treatment areas.

In the Black Hills, blue columbine is found in a variety of relatively moist habitats, usually on north aspects. Occurrence is often patchy; only a few individuals in each patch may bloom during a given year, and non-flowering individuals are often inconspicuous.

Because the possible occurrences of this species are not within proposed treatment areas, there would be no direct effects under any alternative. Alternative 1 would have no indirect effects. Alternatives 2 and 3 are not likely to cause a measurable change in water yield (EA p. 101), but any increase could benefit this species by adding suitable habitat.

The cumulative effects area for blue columbine is moist drainage bottoms and moist slopes. Soil disturbance, introduction of invasive species, and changes in microsite moisture can negatively affect sensitive plant populations. Past actions in the Black Hills have collectively decreased quality of suitable habitat for sensitive plant species. Implementation of Alternative 1 could add slightly to negative cumulative effects due to continued buildup of hazardous fuels; resulting wildfires could burn with unusual vigor, affecting moist areas rarely burned under more natural conditions. Alternatives 2 and 3 could increase negative cumulative effects by disturbing soil and spreading invasive species. Mitigation (EA pp. 29, 31-35) would minimize these effects.

The risk to blue columbine from implementing Alternative 1 is low. No new actions would take place, and natural processes would probably continue unaltered in the short term. The risk of implementing either Alternative 2 or 3 is low because no populations of blue columbine exist in proposed treatment units. Risk is further reduced because little potential habitat exists in the project area, and all areas of potential habitat within proposed treatment units were surveyed for blue columbine.

Due to potential indirect and cumulative effects and low risk as described above, blue columbine is assigned a determination of “may adversely impact individuals, but not likely to result in a loss of viability on the planning area, nor cause a trend to federal listing or a loss of species viability range-wide” for all alternatives.

### **Species Not Recorded for Which Suitable Habitat Exists**

Yellow lady's-slipper occurs in low to middle elevations in the northern and eastern Black Hills, generally on moist, rocky slopes along forested drainages. Highbush cranberry can occur in wet, shaded habitats along streams, springs, and canyon bottoms at middle elevations in the northern Black Hills. Although the Cement project area includes moist birch stands and a few riparian areas, neither of these species is known to occur in the project area.

Discussion of potential effects on species in this category is found on pp. 93-95 of the Cement EA.

### **Species without Suitable Habitat in Project Area**

The project area does not include suitable habitat for leathery grapefern, bristlystalked sedge, or sage willow. Rationale for this conclusion is described below.

Leathery grapefern: In the Black Hills, this species is found in riparian areas dominated by white spruce or mixed spruce/ponderosa pine. Spruce does not occur in the Cement project area (EA p. 61). All known Black Hills occurrences of leathery grapefern are in the Norbeck Wildlife Preserve, roughly 40 miles southeast of the project area.

Bristlystalked sedge: This species is found in spruce bogs or seeps or in spruce stands along streams. Spruce does not occur in the project area.

Sage willow: The known occurrence of this species is in McIntosh Fen, a unique botanical location approximately 25 miles southeast of the project area. This species requires cold, seep- or spring-fed, saturated substrates, produced in the Black Hills by unusual hydrologic conditions where sedimentary layers of the Limestone Plateau intersect impermeable schist or shale of the crystalline Central Core. This situation does not occur in the project area.

Prairie moonwort is addressed in the document titled "Additional Information and Determination for the Cement Project Area and Biological Evaluation Based on New Information", dated July 9, 2003 (project file).

### **Management Indicator Species**

*This section supplements the management indicator species effects analyses, EA pp. 83-89.*

American three-toed woodpecker: The Forest monitors this species through the Rocky Mountain Bird Observatory. Other woodpecker studies have been conducted in the Black Hills in the last four years by the South Dakota School of Mines and Technology, the University of Wyoming, and the Forest Service Rocky Mountain Research Station. RMBO observed 12 three-toed woodpeckers in 2001, 26 in 2002, and 44 in 2003 (Panjabi 2004 [draft]). Most observations were in spruce habitats, which are protected under the Phase 1 Amendment, and this species has thus far not appeared in burned areas. The project area contains little suitable habitat due to the lack of spruce (EA p. 61); therefore, the proposed activities are unlikely to impact three-toed woodpeckers in the project area or their population trend across the Forest.

Bald eagle: Reported observations of bald eagles on the Black Hills National Forest totaled 37 in the winter of 1997-98, 82 in 1998-99, 47 in 1999-2000, 27 in 2000-01, and 75 in 2001-02 (BHNF 2004). On Bearlodge district, 15 bald eagles were documented in the winter of 1999-2000, 15 in 2002-03, and 28 in 2003-04 (to date). Eagle populations appear to be stable or increasing. None of the Cement alternatives is expected to impact bald eagles or Forest-wide winter eagle population.

Black-backed woodpecker: The Forest monitors this species through the Rocky Mountain Bird Observatory. Other woodpecker studies have been conducted in the Black Hills in the last four years by the South Dakota School of Mines and Technology, the University of Wyoming, and the Forest Service Rocky Mountain Research Station. RMBO observed 24 black-backed woodpeckers in 2001, 134 in 2002, and 75 in 2003 on

half the number of transects surveyed in previous years (Panjabi 2004 [draft]). Preliminary data suggest that recent fire and beetle events may lead to detectable positive trends for the black-backed woodpecker (BHNF 2004). Current abundance, age of event, and pre-fire vegetative conditions could all influence the magnitude and timing of trends. No large fires or beetle events have taken place in the Cement project area in recent years, though black-backed woodpeckers have been recorded. Retention of most snags and trees greater than 20" in diameter in treated areas is likely to mitigate effects of the proposed activities; in the absence of fire or beetle events, the project area's suitability for this species would change little under any alternative. Effects on Forest-wide population trend would be negligible.

Brown creeper: The Forest monitors this species through the Rocky Mountain Bird Observatory. One hundred and fifty-three brown creepers were observed in 2001, 145 in 2002, and 136 in 2003 on half the transects conducted in previous years (Panjabi 2004 [draft]). Habitat appears to be stable or decreasing very slightly (BHNF 2004). Preliminary data suggest a strong association between brown creeper and older forests. The Cement action alternatives would not affect late succession stands (2% of the project area) but would decrease mature forest by 8-9%. Even in harvested stands, however, retention of most snags and trees greater than 20" in diameter would preserve critical elements of brown creeper habitat. Effects on brown creeper in the project area are expected to be minor, and effects on Forest-wide population trend would be negligible.

Cockerell's striate disc: Population and monitoring data gathered by Frest and Johannes (1993, 2002) and Forest Service personnel (BHNF 2004) have shown that, at some sites, snail species that were absent during 1993 surveys were present in 2000, and vice-versa. No known occupied sites for this species were lost in recent large fires (BHNF 2004). The project area does not contain any snail colonies known to include Cooper's snail, and does not include the species' preferred habitat. Because all known snail colonies would be protected under all alternatives, proposed activities would have a negligible impact on this species' Forest-wide population trend.

Cooper's Rocky Mountain snail: Population and monitoring data gathered by Frest and Johannes (1993, 2002) and Forest Service personnel (BHNF 2004) have shown that, at some sites, snail species that were absent during 1993 surveys were present in 2000, and vice-versa. No known occupied sites for this species were lost in recent large fires (BHNF 2004). The project area contains five snail colonies known to include Cooper's snail (see Errata, p. 17). Because these colonies, as well as all other known snail colonies, would be protected under all alternatives, proposed activities would have a negligible impact on this species' Forest-wide population trend.

Fringe-tailed myotis: On the Black Hills National Forest, two caves used as bat hibernacula have been gated in the past five years to protect bats from disturbance in winter (BHNF 2004). Gating of two additional caves or mines is proposed. Other hibernacula on private and State of South Dakota land have been similarly protected. The action alternatives would have little effect on roosting or foraging habitat in the project area and negligible influence on fringe-tailed myotis populations across the Forest.

Merriam's turkey: Turkey populations in the Black Hills have been increasing since 1995 and are currently at an all-time high (BHNF 2004). The action alternatives would

increase preferred habitat in the project area and could contribute to the Forest-wide population increase, though turkey numbers in the Black Hills appear to be influenced at least as much by weather as by habitat.

Mountain lion: Population of mountain lions in the Black Hills appears to be stable to increasing (BHNF 2004). Research into territory size and current population is ongoing. Action alternatives would improve habitat for lion prey species and may positively affect Forest-wide lion population trend.

Mule deer: Black Hills National Forest mule deer populations have fluctuated in recent years, but are currently 10% lower than in 1998 (BHNF 2004). In the Wyoming part of the Forest, the population currently may be increasing (Sandrini 2001b). The action alternatives would improve deer habitat capability and may contribute to stabilization or increase in Forest-wide population trend.

Northern goshawk: Goshawk population and habitat trends across the Black Hills National Forest appear to be relatively stable or slightly decreasing in the short term (BHNF 2004). Wildfires, beetle infestations, and storms have destroyed some known nests on the Forest in recent years, with unknown effects on use of the associated territories. New or previously unknown nests have also been discovered. The Cement alternatives would reserve known and replacement goshawk nesting habitat and post-fledging areas in the Cement project area, and any newly found nests would be protected. The action alternatives would have little impact on this species, and should contribute towards stabilizing Forest-wide population trend.

Pygmy nuthatch: The Forest monitors this species through the Rocky Mountain Bird Observatory. Three pygmy nuthatches were observed in 2001, two in 2002, and none in 2003 on half the number of transects surveyed in previous years (Panjabi 2004 [draft]). The species' rarity is confirmed through Breeding Bird Survey efforts, as only one bird has been detected on the Forest despite numerous annual surveys. Habitat appears to be stable or decreasing slightly (BHNF 2004). This species appears to be associated with snags and relatively large trees (Keller 1992); since all alternatives would retain most snags and large-diameter trees, effects on Forest-wide population trend are likely to be negligible.

Regal fritillary: This butterfly species has not been found during recent butterfly surveys on the Black Hills National Forest (BHNF 2004). Because the Cement alternatives would have little effect on the limited suitable habitat that occurs in the project area, impacts on the species' Forest-wide population would be negligible.

Rocky Mountain elk: The Black Hills elk population has increased over the last few years, from roughly 3,000 in 1998 to an estimated 4,190 in 2002. The action alternatives would improve elk habitat capability and may contribute to stabilization or increase in Forest-wide population trend.

Townsend's big-eared bat: Across the Forest, Townsend's big-eared bat populations have been decreasing (BHNF 2004). On the Black Hills National Forest, two caves used as bat hibernacula have been gated in the past five years to protect bats from disturbance in winter. Gating of two additional caves or mines is proposed. Other hibernacula on private and State of South Dakota land have been similarly protected. Because there are no known caves or mines in the project area and the action alternatives would have little

effect on snags or foraging habitat, this project would have negligible effects on Townsend' big-eared bat populations across the Forest.

White-tailed deer: Black Hills National Forest white-tailed deer populations increased approximately 16% between 1998 and 2002 (BHNF 2004). The action alternatives would improve deer habitat capability and may positively affect Forest-wide population trend.

## **Migratory Birds**

Many species of migratory birds are of international concern due to naturally small ranges, loss of habitat, observed population declines, and other factors. The Black Hills National Forest recognizes the ecological and economic importance of birds, and approaches bird conservation at several levels by implementing 1) Forest Plan objectives, standards, and guidelines, 2) a Forest-wide bird monitoring program, and 3) site-specific mitigation and effects analyses for identified species of concern.

A variety of Forest Plan objectives, standards and guidelines further the conservation of migratory birds. Objectives describe desired resource conditions. The most relevant objectives for bird conservation are those relating to vegetation diversity, landscape structural diversity, snags and down woody material, riparian condition, habitat improvements, and disturbance processes (see Forest Plan objectives 201-232). Standards and guidelines are designed to help achieve those objectives, and are implemented at the project level. The most relevant standards and guidelines to migratory birds are 2101-2109 (Forested Landscapes), 2201-2208 (Hardwoods and Shrubs), 2301-2308 (Snags and Down Woody Material), 2505-2508 (Proper Use or Residual Levels - Riparian/Uplands), 3101-3115 (Endangered, Threatened or Sensitive Species Protection and Management), and 3202-3212 (General Fish and Wildlife Direction).

Bird monitoring is conducted at the Forest level to determine species distribution, abundance, and trend (Panjabi 2001, 2003a, 2004 [draft]). The monitoring is designed and conducted by the Rocky Mountain Bird Observatory to provide statistically rigorous population trend data for at least 61 species that breed in the Black Hills. Trend data will assist the Forest in determining whether additional conservation measures are necessary.

Species of concern applicable to project-level conservation are identified by many sources, including the Endangered Species Act, the Regional Forester's sensitive species list, the Black Hills National Forest Management Indicator Species list, internal and public scoping efforts, the Wyoming Partners in Flight Plan (PIF), and the US Fish and Wildlife Service's Birds of Conservation Concern (BCC) publication (US Fish and Wildlife Service 2002).

The Landbird Strategic Plan (USDA Forest Service 2000) recommends that management activities complement the goals and objectives identified in the PIF Conservation Plans.

The highest priority (Level 1) bird species listed in the Wyoming PIF Bird Conservation Plan for forest, montane riparian, and aspen habitat groups include northern goshawk and bald eagle. These species are discussed above and on EA pp. 60-68.

The BCC 2002 publication partitions North America into 37 bird conservation regions (BCRs). The Black Hills is included in BCR 17 (Badlands and Prairies). Of the 24 bird species found in BCR 17, eleven are duplicated on the Regional Forester's sensitive species list and are evaluated above or on EA pp. 60-83 if they have potential to occur in the Black Hills. Eight species are not expected to occur in the Black Hills due to lack of habitat. The five remaining species (golden eagle, prairie falcon, black-billed cuckoo, red-naped sapsucker, dickcissel) have documented occurrence on or near the Black Hills National Forest. With the exception of dickcissel, for which habitat does not exist in the project area, anticipated effects on these species are evaluated below.

**Golden eagle (*Aquila chrysaetos*)**

The golden eagle occurs throughout North America. The species is fairly common in the plains of the western US, Alaska and western Canada. It is a year-round resident of Wyoming and western South Dakota. This bird feeds primarily on small mammals, birds such as grouse and ducks, snakes, and carrion.

This eagle inhabits open country, from barren areas to open coniferous forests, primarily in hilly or mountainous regions, but is also found in deserts and grasslands. It prefers to nest on cliff ledges, but will occasionally use trees for nesting. The golden eagle uses hilltops, cliff ledges, and trees for roosting (DeGraff et al. 1991).

Within the Black Hills, this eagle prefers to nest on sandstone and limestone cliffs (Pettingill and Whitney 1965). There have been numerous recorded observations of golden eagles on the Bearlodge District (district files) as well as recorded observations from the RMBO (Panjabi 2003a). This species has been documented within the Cement project area.

Hunting success may increase due creation of more open habitat with treatments proposed for the Cement area. Additionally, reduced pine overstory in proposed cutting areas would likely increase horizontal screening cover, which would benefit long-term (5-25 years) prey populations and survival and thus indirectly benefit the eagle. Prescribed burning in the forested areas may create more open habitat, increasing hunting opportunities. Enhanced habitat for prey species would benefit eagles. Potential nest trees may decrease in cutting units. Nesting is primarily on cliffs in the Black Hills, yet nests are occasionally found in trees. Nesting habitat would be maintained by providing adequate numbers of large-diameter trees across the project area as per Phase 1 direction.

**Prairie falcon (*Falco mexicanus*)**

The prairie falcon occurs throughout southwestern Canada and the western US. It is locally common throughout the plains, deserts, canyons, foothills and mountains in relatively arid regions (DeGraff et al. 1991). It is a year-round resident of Wyoming and far western South Dakota. This bird nests on cliffs, from low outcrops (Tallman et al. 2002) to tall vertical cliffs over 400 feet in height (Degraff et al. 1991). The prairie falcon feeds on a variety of prey, including ducks, prairie chickens, quail, pigeons, doves, small birds, prairie dogs, mice, ground squirrels, rabbits, grasshoppers, and lizards (Degraff et al. 1991). Hunting occurs in open areas.

Observations in the Black Hills are primarily along the perimeter of the forest, where high cliffs provide nest sites adjacent to open grasslands for hunting (Panjabi 2003a). This species has been observed on the Bearlodge District (district files). There have been no documented occurrences within the Cement project area, although suitable habitat does exist.

Proposed projects in the Cement area would create more open and diverse habitats, benefiting falcons and prey species. Initially, cover would decrease in proposed treatment areas. In the short term, loss of cover for prey species would likely increase falcon hunting opportunities and success by making prey more vulnerable to detection. Increases in understory diversity and production would likely enhance prey species populations and survival over the long term, thus benefiting the falcon.

**Red-naped sapsucker (*Sphyrapicus nuchalis*)**

This species occurs from southern British Columbia and Saskatchewan south throughout the western US. It is a common woodpecker found in deciduous and mixed deciduous-coniferous forests. In the Rocky Mountains, it occurs in aspen stands, or in mixed pine-aspen stands (DeGraff et al. 1991).

It prefers to excavate cavities in aspen, but will also use birch, cottonwood, or ponderosa pine. It may use the same nest tree year after year, but excavates a new cavity each year (DeGraff et al. 1991). In addition to foraging on cambium and sap, it will also consume insects, fruits, mast, and other seeds.

This sapsucker occurs throughout much of the Black Hills, typically in low to moderate abundance, although it is most abundant in the northern Black Hills. The abundance and distribution of this species is tied to the availability of hardwood stands, particularly aspen and birch (Panjabi 2003a). They occur in greatest density in aspen stands (D=13.8 birds/km<sup>2</sup> in Panjabi 2001, and D=10.4 birds/km<sup>2</sup> in Panjabi 2003a). They have been observed in hardwood stands of aspen and birch and mixed pine-aspen stands in the project area and across the Bearlodge District.

Nest trees and nesting habitat for this species may be decreased by the removal of commercial wood (>9" diameter at breast height) in the proposed cutting areas. However, this bird prefers to nest in aspen trees. Additionally, the Forest Plan Phase 1 amendment increases the number of snags required on the landscape along with retaining large-diameter green trees to provide future snags. These standards should be adequate to provide habitat for this species. Silvicultural treatments that encourage aspen would increase preferred habitat for this species. Silvicultural treatments that increase insects would increase prey species abundance. Harvesting timber and thinning may increase foraging opportunities for this woodpecker by providing down woody material for insects. Prescribed burning may have beneficial impacts on this species as a result of increased insect populations invading dead and dying trees after fires (Cerovski 2002).

**Black-billed cuckoo (*Coccyzus erythrophthalmus*)**

The black-billed cuckoo breeds from Alberta and Montana east to the Maritime Provinces and south to northern Texas, Arkansas, and South Carolina. The birds winter in South America. This species favors areas of upland woods that provide a variety of

trees, bushes, and vines. It also occurs in brushy pastures, hedgerows, open woodlands, thickets, and along wooded roadsides. Preferred habitat includes low, dense, shrubby vegetation (DeGraff et al. 1991). They will also inhabit open woods, avoiding extremely dense woods and high elevations (Haldeman 1980).

This species forages among leaves for caterpillars, especially tent caterpillars. The cuckoo will also eat insects and spiders, mollusks, and small wild fruits. The nest is well concealed by overhanging vegetation, usually in a shrub or low tree branch (DeGraff et al. 1991). In 2001, a Rocky Mountain Bird Observatory technician observed two black-billed cuckoos on the Northern Hills District in South Dakota in the Black Hills (Panjabi 2003a). It has been considered an uncommon migrant and summer resident (Tallman et al. 2002). This species has not been documented on the Bearlodge District, although suitable habitat may exist. Suitable habitat would likely increase with proposed treatments. Removing pine would encourage more diversity and production in the understory, benefiting this bird. Prescribed fire may also increase prey abundance.



## Soil and Water

*This section supplements EA p. 100.*

### Direct and Indirect Effects of Alternatives 2 and 3

Timber harvest activities, including felling, skidding, decking, transporting of logs off-site, and slash disposal, can affect soil resources. Potential effects include soil compaction, displacement, and furrowing. Loss of soil nutrients is a potential indirect effect of the action alternatives. The majority of soil nutrients are concentrated in the foliage, branches, and the root system of trees. Where whole-tree yarding is prescribed, some of the nutrients are removed while some remain on-site in the roots. A method of mechanical logging that removes the fewest nutrients is the cut-to-length system in which each tree is mechanically processed along the skid trail so that only the bole is removed. Another advantage of the cut-to-length harvesting system is that forwarders are used as part of the system and provide full suspension of the logs, minimizing soil displacement and cover reduction. Yarding with grapple skidders provides only one-end suspension and the skid trail is swept by the dragged tops, possibly displacing soil and uprooting vegetation.

*This section supplements EA p. 102.*

### Cumulative Effects of Alternatives 2 and 3

Proposed and future activities may create areas of soil compaction that can persist for 10 years or longer. Freeze-thaw cycles, burrowing animals, and root growth can reduce the level of compaction over time. If future timber harvest activities take place in previously treated stands at regular intervals (less than 10 years between entries), limited areas of compaction totaling less than 15% of the treated area may persist from one entry to the next.

## Cumulative Effects Actions

*This section supplements EA p. 47.*

At the time the EA was written, the Welcome/Sand project was in the first stages of planning. At the time of this writing (February 2004), alternatives to the proposed action are being developed. Some members of the public have stated concern that these two projects together could negatively affect the character of the area around the Sand Creek Roadless Area and opportunities for future wilderness or semi-primitive non-motorized designation. The Cement ID team reviewed the Welcome-Sand alternatives as currently formulated and concluded that this new information does not alter the cumulative effects disclosed in the EA.

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## **Response to Comments**

*This section supplements Appendix D.*

Pages D-37, 41, 67. While there is little actual late succession forest in the project area (EA p. 56), forest structure would not be homogenous across the project area following implementation of either of the action alternatives, large areas of mature forest would remain, and many stands would be in a position to develop into late succession forest over time. Whether this would actually happen is not a question this analysis can answer. Observation in the project area of species associated with late succession conditions (northern goshawk, black-backed woodpecker, brown creeper) indicates that despite human activities the project area does provide habitat for such species. Baker and Ehle (2001) demonstrate the complexity of reconstructing pre-settlement fire history, and the EA does not claim that low-density, fire-maintained pine forest was the sole condition across the project area prior to European settlement. This condition certainly

would have existed, especially in the lower-elevation western parts of the project area that border the prairie, but it is equally possible that dense forest conditions existed periodically between large-scale disturbances. Other cited research indicates that this “non-equilibrium” state may have been common in some ponderosa pine forests, with periods of stability interspersed with massive disturbance. Regardless of the fire regime at various points in the past, there is no indication that the proposed actions would cause significant effects in themselves or when considered cumulatively with other actions. The EA discusses potential effects on wildlife and plant species, including those associated with late-succession or undisturbed conditions, and finds no evidence that proposed actions would directly or indirectly cause more than minor negative effects. This is due to retention of all late-succession and most older, dense forest, and almost all snags and large-diameter green trees. Furthermore, closure of many roads would positively affect these habitat characteristics. Cumulatively, a range of habitat conditions would continue to exist in the project area and adjacent areas, with proportions fluctuating over time due both to management and natural events. Again, available information provides no indication that the influence of either action alternative would cause cumulative effects to become significant.

Page D-107. Panjabi (2003) states that the western wood-pewee “occurs widely in the Black Hills, mostly in low to moderate abundance”, but that it appears to have been very common in the past. The Rocky Mountain Bird Observatory recorded this species in the project area, and across the Forest recorded 182 western wood-pewees in 2001, 367 in 2002, and 379 in 2003 on half the number of transects surveyed in previous years (Panjabi 2004 [draft]). Investigation into the reasons for the evident decline from historic population levels is beyond the scope of this analysis. The species is not listed by the Nature Conservancy as a Black Hills conservation target (Hall et al. 2002).

Page D-109. Cooper’s and sharp-shinned hawks: Rocky Mountain Bird Observatory transects have located very few Cooper’s and sharp-shinned hawks. The methods used for these surveys may not be the most effective for locating these species; Panjabi (2003) suggests that surveys using recorded calls may provide better results. These species are not listed as threatened or endangered, Regionally sensitive, or as conservation targets for the Black Hills (Hall et al. 2002).

Atlantis fritillary (*Speyeria atlantis*): The atlantis fritillary butterfly spans the continent (Pyle 1998). The recently described *pahasapa* subspecies is known from Lawrence, Pennington, and Custer counties in South Dakota, but has not yet been observed in Crook County or in the project area. It prefers wet meadows and moist canyons (Marrone 2003). Hall et al. (2002) state that habitat is riparian meadows at higher elevations, with most reports coming from the Deerfield Lake area. There is little habitat of this type in the project area due to lack of surface water (EA p. 98), but what does exist would be unaffected by the action alternatives or, in the Guidinger Spring area, positively affected through enclosure fencing (both alternatives) and closure of unclassified roads (Alternative 2).

## Errata

Roads on private land. Maps included in the EA appear to show that roads on private land are open to public use. Roads on private land are open to the public only where public right-of-way exists, such as on County Road 141 (Moskee Road) and NFSRs 804.1 (Rattlesnake Canyon) and 875.2/863.3 (Grand Canyon). Others may not be open to the public. Users should watch for National Forest System Land boundary signs and always obtain landowner permission before entering private land.

Page 34. Add to measure b1): Crossing locations would be designated by project administrators in consultation with the district hydrologist before the activity begins.

Page 35. Add to measure c): If site-specific information demonstrates an error in the protected streamcourses map, any corrections would be documented in the project file.

Page 82. The EA states that one snail colony containing Cooper's Rocky Mountain snail is known to exist in the project area. This statement was based on the Frest and Johannes (2002) proposal that an *Oreohelix* morph be split from the Cooper's Rocky Mountain snail into its own species. This proposal has not, however, been accepted through a peer review process, and preliminary taxonomic research does not support splitting the species (BHNF 2004). Therefore, the Black Hills National Forest currently recognizes only one species. When the species is not split, the Cement project area contains five known colonies that include Cooper's snail. All five would be protected during proposed activities.