

## PART 5

# CUMULATIVE IMPACTS

Cumulative effects are those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation.

Since most of the existing railroad in Minnesota and South Dakota passes through private lands where current land uses are mostly human developments or agricultural (93 percent of the lands crossed in Minnesota and 80 percent of the lands crossed in South Dakota), it is reasonably certain that those land uses will continue, if not expand to other lands, in the future. Similarly, the project alternatives analyzed for building the new railroad in South Dakota would cross private lands ranging from 84 percent (Alternative B) to 98 percent (Alternative D) of the total length. In Wyoming, the percentage of private lands crossed ranges from 67 percent for Alternative C to 80 percent for Alternative D. Land use along the new rail line extension alternatives is mostly a combination of agriculture and livestock grazing, the latter occurring on private, state and Federal lands. Table 5-1 summarizes the measurable effects to habitats potentially or known to be occupied by listed endangered, threatened, proposed, candidate and petitioned species that would result from implementing alternatives for new railroad construction and rebuild of the existing rail line.

### 5.1 BLACK-FOOTED FERRET

#### 5.1.1 Existing Contributing Factors

Black-footed ferrets were one of the first species to be identified as endangered under the Endangered Species Preservation Act of 1966 and were listed as endangered in 1967. At that time, no specific reasons for listing species as endangered were provided. Later, reasons for endangerment of ferrets were provided in the recovery plan. They include: 1) aggressive control or extermination of prairie dogs, 2) reduction of prairie dog populations by sylvatic plague, 3) susceptibility of black-footed ferrets to canine distemper and other diseases, and 4) susceptibility of small, isolated populations to extinctions due to demographic and environmental variation (USFWS 1988b).

#### 5.1.2 Foreseeable Impacts

Expansion of coal bed methane development on lands in the Powder River Basin could impact this species because of fragmentation of prairie dog colonies. However, coal bed methane development is a federal activity and is not considered a cumulative impact. Black-footed ferrets' survival is linked to prairie dogs. If any of the affected colonies are of suitable size for ferret reintroduction, these sites could be rendered unsuitable and jeopardize efforts to reestablish ferrets in the wild. Since at least half of prairie dog colonies are on private and state lands, impacts to prairie dogs (poisoning, habitat alteration and loss, recreational shooting) will continue and sylvatic plague will continue to be a threat to extant populations. Some states actively promote unregulated and unlimited prairie dog shooting for sport. In many areas development (including minerals, oil and gas) proceeds without regard to the impact on prairie dogs or their habitat. All of these factors continue to influence prairie dog populations, which in turn influence black-footed ferret populations.

### 5.2 PIPING PLOVER

#### 5.2.1 Existing Contributing Factors

The primary threats to the piping plover are habitat modification and destruction and human disturbance to nesting adults and flightless chicks. USFWS identified the elimination of suitable nesting sites on river islands and sandbars because of dam construction as a contributing factor in piping plover decline. Those effects are present on the Missouri River and on the Cheyenne River, below Angostura Reservoir.

### **5.2.2 Foreseeable Impacts**

Since the 1950's, Angostura Reservoir has provided irrigation water for livestock forage and grain crops. Currently, the Bureau of Reclamation is preparing an EIS that will address future operation of the Angostura Dam and Irrigation Project. Additional water withdrawals by private landowners from the Cheyenne River probably will occur and continue in the future.

Continued water development upstream of piping plover habitat may affect the birds. Elevated water temperatures affect forage fish physiology, which influences fish survival rate, growth rate, embryonic development, and susceptibility to parasites and disease. Channelization, irrigation, and the construction of reservoirs and pools have contributed to the elimination of much of the piping plover sandbar-nesting habitat in the Missouri River system. The Missouri River Bank Stabilization and Navigation Project is an example. The wide and braided character of the Missouri River was engineered into reservoirs and a single, narrow navigation channel. Sandbars virtually disappeared between Sioux City, Iowa and St. Louis, Missouri. Current regulation for the Missouri River dam discharges pose additional problems for piping plovers nesting in remaining habitats. Reservoir storage of flows responsible for scouring sandbars has resulted in the encroachment of vegetation along many rivers and greatly reduced channel width. In addition, river mainstem reservoirs now trap much of the sediment load, which results in less aggradation and more degradation of the riverbed and, subsequently, fewer sandbars. Water development on the Platte River system has also been extensive. Continuing water depletions reduce the width and/or depth of water surrounding nest sites, which may increase predation and human disturbance; increased depletions in turn permit vegetation encroachment into nesting areas.

## **5.3 WHOOPING CRANE**

### **5.3.1 Existing Contributing Factors**

Whooping cranes were one of the first species to be identified as endangered under the Endangered Species Preservation Act of 1966 and were listed as endangered in 1967. The whooping crane recovery plan identified the following as contributing to their endangerment: 1) life history and sociobiological characteristics, 2) predation of nests, unpredictable weather during nesting and migration, drought leading to food shortages and fire destruction of nests, 3) human disturbances during nesting, 4) habitat conversion (mid-continental prairies and prairie pot-holes) to agriculture and construction of powerlines within principal migration corridors, 5) environmental pollution, particularly due to oil spills in the Gulf of Mexico, that could threaten wintering areas, and 6) shooting deaths (USFWS 1986a).

### **5.3.2 Foreseeable Impacts**

Migrating whooping cranes may occasionally utilize wetlands and/or grain fields in the vicinity of the existing railroad along the Bad and Missouri rivers in South Dakota. Sixty-four percent of the existing railroad in those areas (Haakon, Jones, Stanley, and Hughes counties) coincides with human developments and croplands, the latter potentially providing feeding and resting sites during migrations. The same land use in those areas is likely to continue and possibly expand in the future.

## **5.4 INTERIOR LEAST TERN**

### **5.4.1 Existing Contributing Factors**

USFWS identified the following as the principal factors that have contributed to the species' endangerment: 1) nest predation by terrestrial carnivores as well as domestic pets contributing to declining reproductive success, and 2) elimination of suitable nesting sites on in-river islands and sandbars due to dam construction with altered flow regulations, whether leading to nest inundation or by altering river flows that formerly scoured islands, removing permanent vegetation and creating new islands and sandbars as suitable nesting habitat. Those effects are present on the Missouri River and on the Cheyenne River, below Angostura Reservoir.

### **5.1.2 Foreseeable Impacts**

Since the 1950's, Angostura Reservoir has provided irrigation water for livestock forage and grain crops. Currently, Bureau of Reclamation is preparing an EIS that will address future operation of the Angostura Dam and Irrigation Project. Additional water withdrawals by private landowners from the Cheyenne River probably will occur and continue in the future.

## **5.5 TOPEKA SHINER**

### **5.2.1 Existing Contributing Factors**

Sedimentation and eutrophication (diminished dissolved oxygen resulting from release of nutrients in streams) have been cited as primary impacts to Topeka shiners. Intensive agricultural developments within inhabited watersheds and diminished aquifer recharge has led to siltation and pollution of streams, which may become warm, muddy and ephemeral during summers. Impoundments on tributaries and channelization of drainages has also reduced in-stream flows and degraded habitats while over-grazing by livestock in riparian zones has reduced water quality. These practices have, and will continue to occur, on private and agricultural lands in southwestern Minnesota and eastern South Dakota in the vicinity of the existing railroad.

### **5.1.2 Foreseeable Impacts**

The continued implementation of small watershed flood control programs in portions of the species' range is a continued threat to the population. Feedlot operations on or near streams are also known to impact prairie fishes due to organic input resulting in eutrophication.

The Vermillion River basin contains the largest complex of Topeka shiner populations in South Dakota. Multiple reservoir construction is now planned on streams occupied by the Topeka shiner in this basin, further threatening the species. Additionally, the continued use of pesticides and fertilizers near stream channels the fish may inhabit could be detrimental to their continued survival.

## **5.6 PALLID STURGEON**

### **5.6.1 Existing Contributing Factors**

Dams and altered water flows on the Missouri River have blocked sturgeon migration, eliminated or altered spawning habitats, reduced food sources, altered water temperatures, reduced turbidity, and changed the hydraulics of the river (Dryer and Sandvol 1993). Along with over-fishing, pollution, (principally from organic wastes but also from insecticide residues and trace metals) has contributed to the species' decline.

Destroyed and altered habitats are believed to be the primary cause of adverse effects on reproduction, growth, and survival of the pallid sturgeon, as well as other fish species native to the Missouri, Platte, and Mississippi rivers. Recovery of the pallid sturgeon is unlikely to be successful without restoring the critical portions of morphology, hydrology, temperature regimes, and sediment/organic matter transport to the rivers that provide the life requisites for the pallid sturgeon.

### **5.6.2 Foreseeable Impacts**

Six mainstem dams on the Missouri River without fish passage facilities block pallid sturgeon migrations and have inundated spawning and nursery areas. The remaining mainstem riverine habitat between dams and downstream of the dams has been altered by removal of snags, reductions in sediment and organic matter transport and deposition, channel bed degradation, flow modification, and hypolimnetic releases. Since most pollution sources are from private lands and commercial enterprises (packinghouses, stockyards, landfills, mines, sewage treatment plants, and industrial effluents), water quality degradation is expected to continue.

## **5.7 AMERICAN BURYING BEETLE**

### **5.7.1 Existing Contributing Factors**

Reasons for declines of American burying beetles are unclear. Some have speculated that destruction of virgin forests is to blame, however populations have been found in native grasslands. Widespread use of pesticides, principally DDT, may have contributed to endangerment, but there is no supporting evidence. Agricultural and grazing practices within the beetle's range could have changed vertebrate species composition and densities, making suitable carrion difficult for beetles to locate.

### **5.7.2 Foreseeable Impacts**

As human populations increase in more remote areas, beetles could be impacted by artificial lights and electronic bug-zappers. If any of these are current sources of species' endangerment, they are likely to continue since all occur on private lands.

As linear projects are constructed, there is the possibility of increasing edge habitat which may result in the increase in the occurrence and density of vertebrate predators and scavengers such as the American crow, raccoon, fox, opossum, and skunk, which compete with the American burying beetle for carrion. Increased agricultural and grazing practices within the beetle's range compound the changes in vertebrate species composition and densities caused by habitat fragmentation. Additionally, as the human population increases and more remote areas are inhabited, impacts due to artificial lights (which are known to attract and disorient many species of nocturnal insects) may be a threat to the species.

## **5.8 MINNESOTA DWARF TROUT LILY**

### **5.8.1 Existing Contributing Factors**

The most significant reasons for the plant's current status are biological and historical. The species is a narrow endemic that spreads very slowly. Direct habitat destruction probably accounts for the greatest population losses over the last century. Expansion of the cities of Faribault and Zumbrota probably has destroyed colonies. Agricultural development may also impact the species. Where cultivation has occurred at the base of bluffs, colonies may have been destroyed.

### **5.8.2 Foreseeable Impacts**

Since the species is restricted to only a few sites, most of which are on private lands, it is subject to physical disturbance by people driving off-road vehicles, conversion of habitat to cropland, residential or commercial development and removal by wildflower collectors.

## **5.9 HIGGIN'S EYE PEARLY MUSSEL**

### **5.9.1 Existing Contributing Factors**

Habitat modification including land use changes, river channel modifications, and pollution continue to affect this mussel. Large to medium clear water streams where the species is found have been lost due to continued development of impoundments, channelization, soil erosion and sediment accumulation originating from land use practices.

### **5.9.2 Foreseeable Impacts**

Expanded agriculture or modified land use practices in the watershed, toxic substance spills, point discharges of harmful chemicals, low water levels and recreational boat traffic continue to be a threat to its population.

## **5.10 WINGED MAPLELEAF MUSSEL**

### **5.10.1 Existing Contributing Factors**

Development of impoundments, channelization, soil erosion, and sediment accumulation contributed to the mussel being listed.

### **5.10.2 Foreseeable Impacts**

Continued habitat modification and expanded agriculture practices in watersheds could further impact the species. Power plant operations can cause toxic substance spills, point discharges, and low water levels which could impact the mussel.

## **5.11 KARNER BLUE BUTTERFLY**

### **5.11.1 Existing Contributing Factors**

Oak savannah habitat on which this species depends have been modified or eliminated by urbanization, silviculture, and fire suppression, which has led to altered vegetation succession with diminished habitat suitability. These contributing factors to the species' endangerment are likely to continue since most occur on private lands.

### **5.11.2 Foreseeable Impacts**

The continued loss or alteration of habitat from industrial, commercial, and residential development; fire suppression and habitat fragmentation are likely to continue.

## **5.12 UTE LADIES'-TRESSES ORCHID**

### **5.12.1 Existing Contributing Factors**

The species is primarily threatened by loss and modification of riparian habitat through urbanization, stream channelization, and construction projects in wetlands and meadows.

### **5.12.2 Foreseeable Impacts**

Overgrazing or heavy summer grazing and trampling by livestock in occupied habitat is detrimental. Introduction of exotic weeds and indiscriminate application of herbicides both can affect populations. Habitats on private lands will continue to be affected by agriculture and livestock grazing.

Additionally, expansion of coal bed methane development on lands in the Powder River Basin could impact Ute ladies'-tresses orchid if ground disturbing activities occur within existing populations or suitable habitat (wetlands) for the species to establish. However, coal bed methane development is a federal activity and is not considered a cumulative impact.

## **5.13 PRAIRIE BUSH-CLOVER**

### **5.13.1 Existing Contributing Factors**

Agricultural development, as well as quarrying, road and residential developments, have been cited as responsible for eliminating this plant from most of its former prairie habitat. Heavy livestock grazing could also be detrimental.

### **5.13.2 Foreseeable Impacts**

The practices noted above are expected to continue for the life of this project. The steady increase in conversion of prairies to agricultural land use, increased linear projects such as construction of roads and railroads, herbicide use and mowing will result in a decrease in suitable habitat for the species.

## **5.14 LEEDY'S ROSEROOT**

### **5.14.1 Existing Contributing Factors**

Ground water contamination by municipal and residential wastes and agricultural pesticides, decreased ground water seepage, and physical destruction of cliff habitats have contributed to this species' decline.

### **5.14.2 Foreseeable Impacts**

Future water contamination could impact this species.

## **5.15 WESTERN PRAIRIE FRINGED ORCHID**

### **5.15.1 Existing Contributing Factors**

The species is primarily threatened by loss and modification of habitat through conversion to cropland, overgrazing by livestock, hay mowing, drainage of wetlands and fire suppression.

### **5.15.2 Foreseeable Impacts**

Insecticide use has and will continue to affect the species' pollinator, hawkmoths. Water demands on private and public lands are likely to lower ground water tables, thereby affecting wetlands inhabited by the orchid (Hansen et al, 1999). Habitats on private lands will continue to be affected by agriculture, livestock grazing, mowing, habitat conversion and application of insecticides.

## **5.16 BALD EAGLE**

### **5.16.1 Existing Contributing Factors**

The USFWS has proposed to remove the bald eagle as a threatened species from the endangered species list citing success of recovery and protection efforts. Recovery and protection efforts include protection of wintering and nesting habitats on Federal lands and regulation of adverse activities on private lands under various protective laws, the prohibition of collecting bald eagles, reduction and regulation of harmful chemicals, principally DDT and other toxic pesticides, and reduction of known mortality sources such as electrocution from power lines, and indiscriminate shooting.

### **5.16.2 Foreseeable Impacts**

Human populations in areas affected by the proposed project are likely to expand in the future; therefore, there will probably be some cumulative effects of additional project-related disturbances to bald eagles. While those may temporarily or permanently displace some individuals from wintering and feeding sites near the project, such displacement may or may not negatively affect those individuals' reproductive success and/or long-term survival.

Coal bed methane expansion on lands in the Powder River Basin could impact bald eagles due to increased activity and loss of some foraging habitat. However, coal bed methane development is a federal activity and is not considered a cumulative impact. Three bald eagle winter roost sites are known to occur within the project area.

## **5.17 MOUNTAIN PLOVER**

### **5.17.1 Existing Contributing Factors**

Mountain plover habitat is threatened by the conversion of grasslands to croplands and urban uses, domestic livestock management, and other land uses (e.g., prairie dog control, and mineral development) throughout this species breeding and wintering range. Many grasslands are not suitable breeding habitat, and therefore, are not used by mountain plovers. Conversion of these grasslands to cropland also can be considered detrimental because such conversion may create locally acceptable habitat on which mountain plovers are then exposed to tilling. Consequently, grassland conversion may be considered a threat to mountain plover conservation whether or not the grasslands are presently suitable breeding habitat, particularly when conversions are proposed within the southern portion of the bird's breeding range. This species has been proposed for listing as threatened because, in part, a significant amount of their breeding habitats in grasslands have been converted to agriculture. Such effects also apply to loss of prairie dog colonies in which mountain plovers may nest. Livestock grazing practices do not mimic grazing effects by bison and do not promote vegetative conditions suitable for mountain plover nesting.

### **5.17.2 Foreseeable Impacts**

Prairie dog control on private lands is expected to continue as well as conversion of grasslands to croplands. Additionally, range management practices for domestic livestock, together with extensive

eradication of prairie dogs and other burrowing rodents will continue to adversely affect mountain plover habitat.

Oil, gas and mineral leasing and development occur throughout the breeding range of the mountain plover. Ongoing development of natural gas resources in southwest Wyoming now exceeds the rate of development projected three years ago, and the volume of natural gas development expected to occur could make the rate of development the highest in the Nation. Oil and gas development requires construction of individual well pads, access roads, travel corridors, and pipelines. Mineral resources found within the range of the mountain plover include coal, uranium-vanadium, bentonite, and hard rock minerals. Many of these resources occur on public lands and are commonly mined using surface mining techniques. However, coal bed methane development is a federal activity and is not considered a cumulative impact. Up to 25 percent of mountain plover habitat at the Antelope Coal Mine in Converse County, Wyoming, has been affected by mining disturbance in the past. Other surface coal mining is proposed in Wyoming that may impact mountain plovers or their habitat. In southwest Wyoming the "checkerboard" pattern of alternating private and public land (Federal and State sections) also reduces the effectiveness of Federal plover conservation measures.

The expansion of coal bed methane development on lands in the Powder River Basin could impact this species. The expansion would entail drilling, completing, operating, and reclaiming approximately 3,000 new productive wells and related production facilities in Campbell and Converse counties in Wyoming. Mountain plover could be displaced because of noise, human activity and vehicles using two-track roads.

Land exchange or disposal by Federal agencies may also involve mountain plover habitat. Land exchanges on the Thunder Basin National Grassland in Wyoming have resulted in transfer of known habitat on private land to Forest Service ownership.

## **5.18 SWIFT FOX**

### **5.18.1 Existing Contributing Factors**

Swift fox currently are not a protected species under the ESA. Loss of native prairie habitat, trapping, hunting, automobiles and prey reduction from rodent control are some reasons for its continued decline. Since the animal is not listed under the ESA, in many states it is still legal to shoot swift fox. Prairie dog poisoning on private and Federal lands has reduced prey availability for the species and may concentrate swift fox in the same areas where coyotes hunt. This may lead to greater predation of coyotes on swift fox. Coyote control by animal damage control agents may have accidentally affected swift fox. But, increase coyote control may benefit swift fox by reducing coyote populations, thereby reducing their overall predation on swift fox (Hansen et al. 1999).

### **5.18.2 Foreseeable Impacts**

Swift fox are susceptible to mortality on highways and also vulnerable to trapping, whether inadvertent or deliberate. These sources of impacts are likely to continue.

The expansion of coal bed methane development on lands in the Powder River Basin could impact swift fox. Human activity, noise and mortalities from maintenance vehicles could be some of the impacts from this development.

## **5.19 STURGEON CHUB**

### **5.19.1 Existing Contributing Factors**

The sturgeon chub is presently a candidate species and receives no protection under ESA. However, the sturgeon chub was petitioned for listing as endangered because of habitat alteration (flooded river valleys, altered temperature and flow regimes, reduced sediment transport and turbidity, habitat fragmentation, restricted movements) by dams.

### **5.19.2 Foreseeable Impacts**

Impacts to the sturgeon chub have resulted by continued small-scale impoundments, levees, and diversion projects throughout the Missouri River basin. Presently, only one-third of the river remains in a free-flowing state. Water manipulation through dams and irrigation diversions continues to threaten the species. Water manipulation, habitat loss, and predation are the greatest threats facing sturgeon chub populations. Further fragmentation of sturgeon chub populations due to dam construction and channelization are a potential threat to the species, reducing genetic variability and preventing repopulation of tributaries after severe drought conditions. Dredging for channel maintenance and sand/gravel extraction may be an obstacle to fish movement.

Future habitat losses are likely to result from energy development (coal mining) in the upper Missouri River Basin. Other impacts to sturgeon chub may result from inter-basin diversions and increased municipal, industrial and irrigation usage. Power plant and water supply intakes may entrain and impinge sturgeon chub.

## **5.20 BLACK-TAILED PRAIRIE DOG**

### **5.20.1 Existing Contributing Factors**

Black-tailed prairie dogs were petitioned for listing as threatened because of multiple factors that include conversion of prairie habitats to agriculture, urbanization of occupied habitats, sport shooting, sylvatic plague, poisoning on rangelands grazed by livestock, and extensive fragmentation of grasslands. However, the USFWS has determined that listing the species is warranted but precluded by other higher priority acts. Presently, prairie dog poisoning has been suspended on Federal lands. Prairie dog shooting is regulated by state wildlife agencies; but the Forest Service can and has issued closure orders in the past for prohibiting specific activities including shooting or the discharge of firearms (Hansen et al. 1999).

### **5.20.2 Foreseeable Impacts**

Expansion of coal bed methane development on lands in the Powder River Basin could impact this species due to fragmentation of prairie dog colonies.

Since at least half of prairie dog colonies are on private and state lands, impacts to prairie dogs (poisoning, habitat alteration and loss, recreational shooting) will continue and sylvatic plague will continue to be a threat to extant populations. Some states actively promote unregulated and unlimited prairie dog shooting for sport. And since the animal is not protected under the ESA, in many areas development (including minerals, oil and gas) proceeds without regard to the impact on prairie dogs or their habitat. All of these factors continue to influence prairie dog populations, which in turn influence black-footed ferret populations.

**Table 5-1  
Summary of Measurable Effects to Habitats**

Species	Potential or Occupied Habitat	Measurable Effects to Habitat Parameter	Measurement of Effect to Habitat Parameter by Alternative						Mitigation Possible
			Existing Railroad	Alternative B	Alternative C	Phiney Flat Alternative	W G Flat Alternative	Alternative D	
Black-footed ferret	Potential	miles within prairie dog colonies in SD and WY	Unknown	11.5	17.5	17.5	17.5	6.2	Yes
Piping plover	Potential	Miles within 1.0 mile	20.2	75.6	46.9	50.6	48.2	29.4	Yes
		Miles within 0.5 mile	16.5	51.2	25.1	26.0	25.8	19.1	
		Miles within 500 feet of rivers in SD	4.8	6.1	4.8	4.8	5.2	2.7	
Whooping crane	Potential	Miles within 1.0 mile	36.3	none	none	none	none	none	No
		Miles within 0.5 mile	31.0						
		Miles within 500 feet of rivers in SD	8.7						
Interior least tern	Potential	Miles within 1.0 mile	20.2	75.6	45.9	50.6	48.2	29.4	Yes
		Miles within 0.5 mile	16.5	51.2	25.1	26.0	25.8	19.1	
		Miles within 500 feet of rivers in SD	4.8	6.1	4.8	4.8	5.2	2.7	
Topeka shiner	Occupied	Miles within 500 feet	18.4	none	none	none	none	none	Yes
		Number of sites within 500 feet of streams in MN and SD	53						
Pallid sturgeon	Potential	Miles within 500 feet	8.7	21.1	19.2	14.4	20.5	11.6	Yes
		Number of sites within 500 feet of rivers in SD	59	186	130	106	134	56	
American burying beetle	Potential	Miles within potentially suitable land cover (including suitable soils on new railroad) in SD	460.0	33.4	35.4	36.0	36.8	41.7	No
Minnesota dwarf trout lily	No Potential	None	none	none	none	none	none	none	not applicable
Higgin's eye pearly mussel	No Potential	None	none	none	none	none	none	none	not applicable
Winged maple leaf mussel	No Potential	None	none	none	none	none	none	none	not applicable
Karner blue butterfly	Potential	Miles within potential deciduous forest land cover in MN	5.0	none	none	none	none	none	Yes
Ute ladies'-tresses orchid	Potential	Miles within wet meadow wetlands	none	0.90	0.86	0.96	0.73	1.08	Yes

**Table 5-1  
Summary of Measurable Effects to Habitats**

Species	Potential or Occupied Habitat	Measurable Effects to Habitat Parameter	Measurement of Effect to Habitat Parameter by Alternative						
			Existing Railroad	Alternative B	Alternative C	Phiney Flat Alternative	W G Flat Alternative	Alternative D	Mitigation Possible
		Number of potential habitat sites crossed in SD and WY		2	4	4	3	1	
Prairie bush-clover	Potential	Number of dry, mesic prairie remnants intersected in MN	59	none	none	none	none	none	Yes
Leedy's roseroot	No Potential	None	none	none	none	none	none	none	not applicable
Western prairie fringed orchid	Potential	number of wet prairie remnants intersected in MN	6	none	none	none	none	none	Yes
Bald eagle	Occupied	Miles within 1.0 mile	67.7	125.0	94.5	99.2	96.8	46.0	Yes
		Miles within 0.5 mile	58.6	81.9	58.4	59.3	59.2	29.9	
		Miles within 500 feet of rivers in MN, SD, WY	14.2	6.1	5.2	5.2	5.5	2.7	
Mountain plover	Occupied	Miles within grassland	none	120.7	208.0	108.0	108.0	67.1	Yes
		Miles within prairie dog colonies in WY		8.1	12.4	12.4	12.4	3.3	
Swift fox	Occupied	Miles within grassland, Shrub steppe-miles within prairie dog colonies in SD and WY	none	248.8	230.4	226.3	227.2	267.4	Yes
Sturgeon chub	Occupied	Miles within 500 feet	none	21.1	19.2	14.4	20.5	11.6	Yes
		Number of sites within 500 feet of rivers and tributaries in SD		186	130	106	134	5.6	
Black-tailed prairie dog	Occupied	Miles within prairie dog colonies in SD and WY	unknown	11.5	17.5	17.5	17.5	6.2	No