

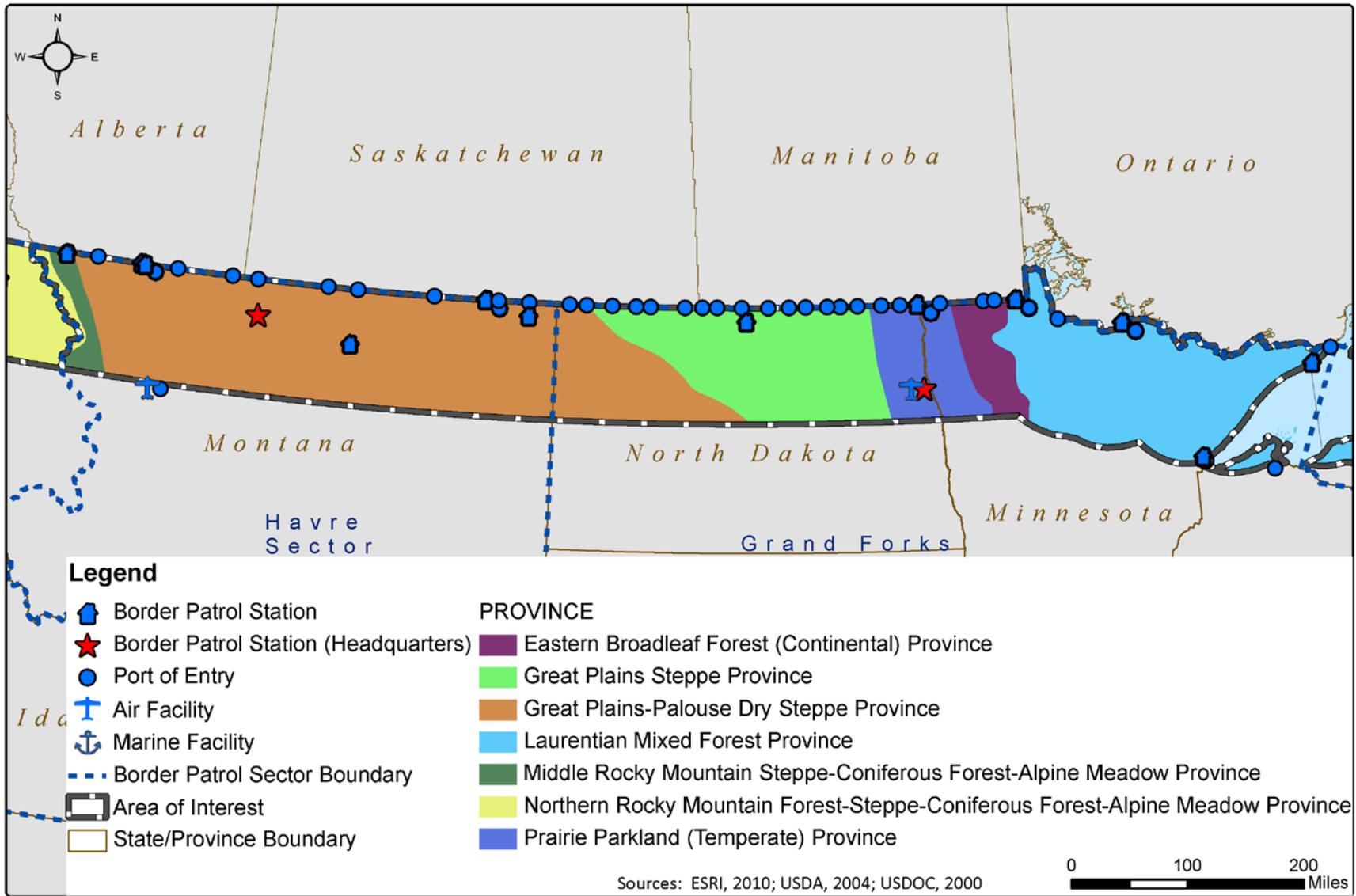
1 **1.5 MIDDLE ROCKY MOUNTAIN STEPPE–CONIFEROUS FOREST–**  
2 **ALPINE MEADOW ECOREGION (M332)**

3 The mountainous region of the Middle Rocky Mountain Steppe–Coniferous Forest–Alpine  
4 Meadow Ecoregion has a great deal of landscape diversity (Figure 1.1-3). A small portion of this  
5 ecoregion lies within 100 miles of the United States-Canada border in Montana. The landscape  
6 is characterized by block fault mountain ranges and further shaped by glaciers. The ecoregion  
7 includes the eastern edge of Glacier National Park, part of the Lewis and Clark National Forest,  
8 and portions of the Blackfeet Indian Reservation.

9 The study area in this ecoregion includes parts of Montana.

1

Figure L-3. Ecoregions in the East of the Rockies Region



2

1 The Rocky Mountain front is mountainous with limestone ridges and many glacial features.  
2 Elevations vary from 5,500 to 8,500 feet (1,678 to 2,593 meters).

3 Despite the northern latitudes and high altitudes of this region, its climate is relatively mild due  
4 to the Pacific Ocean's proximity, with average annual temperatures of about 36 to 45 degrees  
5 Fahrenheit (2 to 7 degrees Celsius) and intense fluctuations of winter temperatures. The length  
6 of the growing season averages 120 days—about the same as a similar latitude on the Great  
7 Plains. Temperature and snowfall vary dramatically with change in altitude. Winds are  
8 predominately westerly, with much of their moisture precipitating on the eastern side of the  
9 ranges. As a result, much of this portion of the Rocky Mountains is characterized by semiarid  
10 climatic conditions. Valleys receive less than 20 inches (51 centimeters) of rain and snow each  
11 year, while up to 30 inches (77 centimeters) is typical in the mountains, mostly as snow. The  
12 climatic effects of topographic relief (for example, rain-shadow effects, effects of prevailing  
13 winds, and other climatic influences) similarly bear on altitudinal zonation (Peet, 1988; Bailey,  
14 1995).

### 15 **1.5.1 REMAINING BLOCKS OF REGIONALLY SIGNIFICANT HABITAT**

16 The blocks of regionally significant habitat below are relatively undeveloped and intact habitat  
17 protected as wilderness, state parks, and state and national forests. Regionally significant or  
18 intact habitat refers to areas of largely unfragmented habitat with few alterations or  
19 disturbances, such as roads or other development. Most areas listed are protected by law  
20 (wilderness areas, national parks), often crossing state and country boundaries, while others may  
21 occupy large expanses of private lands.

22 Selected regionally significant blocks that represent this region include:

- 23 • Part of Glacier National Park—Montana;
- 24 • Parts of Lewis and Clark National Forest— Montana; and
- 25 • Wetland areas on the Blackfeet Indian Homeland/Reservation—Montana.

### 26 **1.5.2 SENSITIVE HABITATS**

27 Within a 100-mile zone adjacent to the U.S.-Canada border are several ecological communities  
28 that represent sensitive habitats. The sensitive habitats described here occur in many of the  
29 larger intact habitat areas in the prior section, and are home to many of the threatened and  
30 endangered species in the next section. For example, alpine meadows grow in many open areas  
31 above the timberline in this geographic region and house protected species, such as the three-  
32 flowered rush (*Juncus triglumis*), as well as a wide variety of other species, such as the Iceland  
33 lichen. Some habitat names used below, such as alpine meadows, describe habitats that occur  
34 across several regional boundaries and are more general in meaning. Others, such as Rocky  
35 Mountain subalpine-montane fen (a type of wetland community), define much more specific  
36 ecological associations.

37 Many of these habitats are very fine in scale and form a patchwork of biologically sensitive and  
38 diverse areas. The list of sensitive habitats is based on those enumerated and described by the  
39 World Wildlife Fund (2001), ecological system descriptions within the NatureServe.org  
40 database, and each state's respective natural resources agency.

- 1 • Alpine meadows–Open meadows at and above timberline;
- 2 • Great Plains ponderosa pine woodland and savanna–Ponderosa pine woodlands surrounded  
3 by grasslands;
- 4 • Rocky Mountain riparian woodland and shrubland–Within the flood zone of rivers, on  
5 islands, bars, and adjacent streambanks;
- 6 • Middle Rocky Mountain montane Douglas-fir forest and woodland–Mixed  
7 deciduous/coniferous montane forest;
- 8 • Rocky Mountain subalpine-montane fen–Mountain wetland fed by mineral-rich surface  
9 water or groundwater, below alpine areas in elevation;
- 10 • Rocky Mountain wooded vernal pool–Temporary pools, usually devoid of fish, that allow  
11 natal amphibians and insects to develop; and
- 12 • Alpine dwarf-shrubland–Dwarf-shrubs or dwarf willows which form a heath-type ground  
13 cover.

14

### Ponderosa pine woodland



15  
16

(U.S. Forest Service)

17 Portions of several preservation areas of national and regional importance lie within this  
18 ecoregion, including Glacier National Park. Disturbance of grasslands, savannas, and shrub-  
19 dominated landscapes has altered the species composition of formerly intact natural  
20 communities. Aggressive burning and fire suppression can also dramatically affect ecological  
21 community structure and species composition.

22 Loss or deterioration of riparian forest habitats and associated water sources deleteriously affects  
23 wildlife. Permanent loss of keystone species, such as black-tailed prairie dogs (*Cynomys*  
24 *ludovicianus*), can cause major impacts on natural communities, of both animals and plants  
25 (Olson et al., 2000). These characteristics suggest that the sensitive ecological communities  
26 require additional safeguards when considering human activities that could disturb the habitat  
27 since disturbance regimes are catalysts of rapid ecological change (Turner, 2010).

1 The major ecological threats to this area include reduced connectivity among habitat blocks and  
2 additional human recreational activity due to increasing commercial development, mining, and  
3 energy resource use.

### 4 **1.5.3 THREATENED AND ENDANGERED SPECIES**

5 Appendix F3 lists the threatened and endangered species in this ecoregion. In forested habitats  
6 within the Middle Rocky Mountain Steppe–Coniferous Forest–Alpine Meadow Ecoregion, the  
7 northern goshawk (*Accipiter gentilis*), great gray owl (*Strix nebulosa*), and black-backed  
8 woodpecker (*Picoides arcticus*) are some of the area’s sensitive species. Examples of other rare  
9 species in Montana include the flammulated owl (*Otus flammeolus*), red-headed woodpecker  
10 (*Melanerpes erythrocephalus*), and yellow-billed cuckoo (*Coccyzus americanus*).

11

#### **Great gray owl**



12

13

(Idaho Fish & Game)

14 Although some species are listed as endangered or threatened at either the Federal or state level,  
15 others are categorized differently as species of “conservation concern” or “special concern.”

### 16 **1.5.4 WILDLIFE**

17 Wildlife species in the Middle Rocky Mountains Steppe Ecoregion are similar to those  
18 inhabiting the Rockies to the north and south; however, parts of this inter-mountain ecoregion  
19 have mountain ranges isolated by stretches of arid territory. A unique array of species often  
20 populate each set of mountain ranges; some of these species may be found only on a single  
21 range.

22 The alpine meadows, subalpine forests, and high-elevation grasslands in this ecoregion are home  
23 to several wildlife species, which include game (legally hunted) and non-game (legally protected,  
24 but not endangered or threatened) species. Many birds, such as the northern saw-whet owl  
25 (*Aegolius acadicus*), belted kingfisher (*Ceryle alcyon*), cliff swallow (*Petrochelidon*  
26 *pyrrhonota*), Cooper’s hawk (*Accipiter cooperi*), Swainson’s hawk (*Buteo swainsoni*) migrate  
27 into or out of this ecoregion in spring and fall each year or are permanent residents, although the  
28 avian migration is not as temporally concentrated as many areas of the eastern United States. A

1 wide variety of mammals and some permanent-resident bird species remain in the province  
2 throughout the year, such as the coyote (*Canis latrans*), red fox (*Vulpes vulpes*), and bobcat  
3 (*Lynx rufus*).

#### 4 **1.5.5 VEGETATIVE HABITAT**

5 Altitudinal zones are prominent in this ecoregion. Below the subalpine zone, Douglas-fir  
6 (*Pseudotsuga menziesii*) is the dominant coniferous tree species. Grand fir (*Abies grandis*) is an  
7 important component on the west side of the continental divide and western red cedar (*Thuja*  
8 *plicata*) and western hemlock (*Tsuga heterophylla*) are the most typical species of the montane  
9 zone or belt. Lodgepole pines (*Pinus contorta*) grow primarily in the eastern area. On the west  
10 side of the continental divide and below the zone of Douglas-firs, ponderosa pine (*Pinus*  
11 *ponderosa*) becomes the dominant tree, making up a dry-forest type. Semi-desert vegetation of  
12 sagebrush or grass-covered steppe covers the lower-elevation slopes of the mountains and plains  
13 (Bailey, 1995).

14

#### **Sagebrush steppe**



15

16

(Montana Department of Natural Resource and Conservation)

17 Forests inhabit mostly northern and eastern slopes. Although the south and west-facing slopes  
18 receive similar amounts of rain or snowfall, their temperatures are much warmer. They support  
19 few trees due to the drier conditions; instead, shrubs or grasses vegetate these slopes.

20 In addition to the extensive conifer forests, the ecoregion contains several other plant  
21 communities: alpine meadows, grasslands, wooded riparian stands, and higher-elevation tree-line  
22 and alpine communities. Vertical zonation of vegetation is typical and strongly evident.

23 Secondary climatic effects of elevation change due to rain shadows, prevailing winds, and  
24 thermal inversions are also evident (Peet, 1988).

25 Examples of invasive species in this region include: spotted knapweed (*Centaurea maculosa*),  
26 leafy spurge (*Euphorbia esula*), Dalmatian toadflax (*Linaria dalmatica*), orange hawkweed  
27 (*Pilosella aurantiaca*), meadow hawkweed (*Hieracium caespitosum*), Canada thistle (*H.*  
28 *caespitosum*), yellow toadflax (*Linaria vulgaris*), Russian knapweed (*Acroptilon repens*),  
29 houndstongue (*Cynoglossum officinale*), field bindweed (*Convolvulus arvensis*), dyer's woad

1 (*Isatis tinctoria*), and perennial pepperweed (*Lepidium* spp.) (Center for Invasive Plant  
2 Management, 2010).

### 3 **1.5.6 WETLANDS AND WATERWAYS**

4 Wetlands within the Middle Rocky Mountain Steppe Province portion of the project area include  
5 approximately: 13,515 acres of forested/scrub-shrub wetlands; 16,375 acres of emergent  
6 wetlands; 4,205 acres of ponds; 8,730 acres of lakes; and 2,210 acres of riverine habitats  
7 (USDOI, 2010b).

8 These acreages appear much lower than other ecoregions, but this is partially due to only a small  
9 portion of the province lying within the proposed project area. It is also partially due to the  
10 rugged topography.

11 Coeur d'Alene Lake is a large natural lake, which was enlarged in the early 20<sup>th</sup> century by a  
12 relatively small dam at the outlet (Post Falls Dam) that raised the water level about 8 feet and  
13 inundated a large area in the panhandle of Idaho. The lake extends between the boundary of this  
14 ecoregion and the Northern Rocky Mountain Forest Steppe–Coniferous Forest–Alpine Meadow  
15 Ecoregion.

### 16 **1.5.7 AQUATIC RESOURCES**

17 Fisheries and aquatic resources are of great importance in this ecoregion. Montana is famous for  
18 fishing. Rocky Mountain anglers increased 8.3 percent between 1991 and 1996, with 3,303,000  
19 persons holding licenses in the region in 1996 (USFWS, 2004). Mountains in this ecoregion  
20 contain alpine lakes with good fishing. Numerous large natural lakes and reservoirs in both  
21 states offer fishing for warm and cold-water species, including the northern pike (*Esox lucius*),  
22 goldeye (*Hiodon alosoides*), mountain whitefish (*Prosopium williamsoni*), and steelhead trout  
23 (also known as rainbow trout, *Oncorhynchus mykiss*).

## 24 **1.6 GREAT PLAINS–PALOUSE DRY STEPPE ECOREGION (331)**

25 This region has rolling plains and tablelands in a broad swath that slopes gradually eastward  
26 from an altitude of 5,500 feet (1,520 meters) near the foot of the Rocky Mountains to 2,500 feet  
27 (760 meters) in the western Great Plains (Figure 1.1-3). The plains are flat, but occasional  
28 valleys punctuate the plains with their associated canyons and buttes. In North Dakota and  
29 Montana, badlands and isolated mountains provide topographic relief (Bailey, 1995).

30 The states in this ecoregion are North Dakota, Montana, and Washington.

31 This region contains three distinct areas in North Dakota and Montana: the northern glaciated  
32 plains (to the northeast and east of the northwestern glaciated plains in North Dakota); the  
33 northwestern glaciated plains (the northern parts of Montana and North Dakota and extending  
34 east from the Missouri River); and the northwestern Great Plains (south of the northwestern  
35 glaciated plains and extending to the Missouri River in North Dakota). They are characterized  
36 by rolling, glacial-till plains shifting to gently sloping, rolling hills and dissected shale plains.  
37 The northern glaciated plains in eastern to central North Dakota have steep slopes adjacent to  
38 major stream valleys with elevations of 2,000 to 6,000 feet (610 to 1,830 meters). The  
39 northwestern glaciated plains include northwestern North Dakota and most of the northern  
40 border of Montana; they have steep slopes bordering some of the large rivers, and elevations of

1 2,500 to 5,000 feet (763 to 1,525 meters). The northwestern Great Plains, in southwest North  
2 Dakota east of the Missouri River and the east and central portions of Montana, contain gently  
3 sloping dissected shale plains with elevations from 1,500 to 3,900 feet (458 to 1,200 meters)  
4 (Bailey, 1995).

5 The Palouse Prairie portion of this ecoregion lies in western Washington at the southern end of  
6 the 100-mile zone of the Northern Border. This area consists of large, isolated hills and low  
7 mountains surrounded by igneous rocks, dissected loess-covered basalt basins, undulating  
8 plateaus, and river breaklands— areas of steep rocky slopes and strongly dissected topography.  
9 Elevations range from 1,200 to 6,000 feet (366 to 1,830 meters), with increasing elevation  
10 approaching the mountains.

11

### North Dakota badlands



12  
13

(NPS)

14 Most of this ecoregion lies in the rain shadow east of the Cascade Range and the Rocky  
15 Mountains. The climate is cold continental with warm, dry summers. The winters are extremely  
16 frigid and have desiccating winds and snow. A minimum of 10 inches (25 centimeters) falls  
17 during the year with an average maximum of 20 inches (51 centimeters) in both the northern and  
18 northwestern glaciated plains; in the northwestern Great Plains, precipitation drops to 15 inches  
19 (38 centimeters). Average temperatures in these areas range from 37 to 48 degrees Fahrenheit (3  
20 to 7 degrees Celsius). The growing seasons vary in each area. The northern glaciated plains  
21 have a growing season of 110 to 135 days; the northwestern glaciated plains run 100 to 130 days;  
22 and the season for the northwestern Great Plains lasts 110 to 160 days.

23 The climate of the Palouse Prairie is temperate-warm with a maritime influence. Summers in  
24 this area are relatively dry; however, approximately 10 to 30 inches (25 to 76 centimeters) of  
25 precipitation is evenly distributed through the fall, winter, and spring. Precipitation during the  
26 winter usually falls as snow. The growing season in this area lasts about 100 to 170 days  
27 (Bailey, 1995).

1 Dry-land farming and raising livestock are the ecoregion’s primary economic activities. At least  
2 85 percent of the northwestern Great Plains and about 90 percent of the Palouse Prairie are used  
3 for farming and grazing of livestock (McNab and Avers, 1994). Much of the natural vegetation  
4 of the northern Great Plains has been altered for crop production and rangeland (Donofrio and  
5 Ojima, 1997).

### 6 **1.6.1 REMAINING BLOCKS OF REGIONALLY SIGNIFICANT HABITAT**

7 The blocks of regionally significant habitat below are relatively undeveloped and intact habitat  
8 protected as wilderness, state parks, and state and national forests. “Intact habitat” or regionally  
9 significant habitat refers to areas of largely unfragmented habitat with few alterations or  
10 disturbances, such as roads or other development. Most areas listed are protected by law  
11 (wilderness areas, national parks) and often cross state and country boundaries, while others may  
12 occupy large expanses of private lands.

13 Considerable potential exists for habitat recovery of areas with only partially modified grazing  
14 lands in this ecoregion. While little to no unaltered habitat remains, the potential for rapid  
15 recovery still exists since much of the habitat is degraded rather than converted. A few exotic  
16 species have invaded; however, most of the dominant plant species still grow on rangelands.  
17 Many of the plant species of this ecoregion have evolved to withstand intense grazing by bison  
18 (*Bison bison*). It is not surprising, therefore, that previously dominant plants still persist and are  
19 likely to become reestablished with restoration efforts.

20 Selected regionally significant blocks that represent this region and are somewhat intact include:

- 21 • Audubon National Wildlife Refuge–Central North Dakota;
- 22 • Bowdoin National Wildlife Refuge–Northern Montana;
- 23 • Charles M. Russell National Wildlife Refuge–Northern Montana;
- 24 • Comertown Pothole Prairie Preserve–Montana;
- 25 • H.R. Morgan State Nature Preserve–North Dakota;
- 26 • Little Missouri National Grassland–Western North Dakota;
- 27 • Lostwood National Wildlife Refuge–Northwest North Dakota;
- 28 • Lower Yellowstone River–Eastern Montana (the largest section of intact Missouri River,  
29 undammed, and with a population of endangered paddlefish);
- 30 • Medicine Lake National Wildlife Refuge–Northeastern Montana;
- 31 • Missouri Coteau–South-central North Dakota;
- 32 • Northern Montana Prairies–Montana;
- 33 • Pine Butte Swamp Preserve–Montana; and
- 34 • Theodore Roosevelt National Park, within the Little Missouri National Grassland–Western  
35 North Dakota.

1 **1.6.2 SENSITIVE HABITATS**

2 Within a 100-mile zone adjacent to the U.S.-Canada border are several ecological communities  
3 that represent sensitive habitats. The sensitive habitats described here occur in many of the  
4 larger intact or somewhat intact habitat areas in the prior section, and are home to many of the  
5 threatened and endangered species in the next section. For example, the H.R. Morgan State  
6 Nature Preserve houses protected species such as the lady-fern (*Athyrium filix-femina*), as well as  
7 a wide variety of common plant species, such as big bluestem (*Andropogon gerardii*). Some site  
8 names, such as the steppe, include a range of habitats found across a large area and are more  
9 general.

10 Many of these habitats are very fine in scale and form a patchwork of biologically sensitive and  
11 diverse areas. The list of sensitive habitats is based on those enumerated and described by the  
12 World Wildlife Fund (2001), ecological system descriptions within the NatureServe.org  
13 database, and each state’s respective natural resources agency.

- 14 • Steppe–Sometimes referred to as short-grass prairie; and
- 15 • Brush prairie – Sagebrush and rabbitbrush, with mixed, short grasses, with many gradations  
16 or combinations of these low-height shrubs and grasses.

17 **1.6.3 THREATENED AND ENDANGERED SPECIES**

18 Appendix F3 lists the threatened and endangered species in this ecoregion. Many grassland  
19 species, such as the peregrine falcon (*Falco peregrinus*), sharp-tailed grouse (*Tympanuchus*  
20 *phasianellus*), swift fox (*Vulpes velox*), and Western hognose snake (*Heterodon nasicus*) are  
21 sensitive species in this ecoregion. Some fish and mussel species also occur in areas where the  
22 Missouri River reaches into the 100-mile project area. Some of these species include blue sucker  
23 (*Cypleptus elongatus*), flathead catfish (*Pylodictis olivaris*), flathead chub (*Platygobio gracilis*),  
24 threeridge (*Amblema plicata*), and the Wabash pigtoe (*Fusconaia flava*).

25 The whooping crane (*Grus americana*) is an endangered and highly monitored species in both  
26 Montana and North Dakota; the sandhill crane (*G. canadensis*) is monitored and endangered in  
27 Washington. Both species inhabit open marshes and wetlands during breeding season as well as  
28 grain fields, shallow lakes, and meadows during the winter and while migrating. They feed on  
29 mollusks, crustaceans, small vertebrates, and waste grain.

30 North Dakota uses a system that ranks species by greatest need of conservation from Level I  
31 (greatest need) to Level III (moderate need). Within these ranks, North Dakota also denotes the  
32 abundance of these species as rare, uncommon, fairly common, common, and abundant. Some  
33 federally endangered or threatened species may be listed as Level I, II, or III, depending on the  
34 current funding and recovery plan status of that species. For example, the piping plover is a  
35 Level II uncommon species in North Dakota, meaning that it has a recovery plan in effect but  
36 still has a moderate to high priority of conservation.

1

### Whooping crane



2  
3

(USFWS)

4 The gray wolf (*Canis lupis*) is also an endangered species in this ecoregion. Since this wolf is a  
5 federally listed species and is designated as a rare Level III species in North Dakota, national  
6 forests and wildlife refuges have plans in place for either monitoring or furthering the recovery  
7 of wolf populations (or both). These plans are on the North Dakota Game and Fish Department  
8 website.

#### 9 **1.6.4 WILDLIFE**

10 Both game (legally hunted) and non-game (legally protected but not endangered or threatened)  
11 animals live in the prairies and grasslands of this ecoregion. Over 300 species of birds —  
12 especially insectivorous species—breed in, migrate through, or winter in this ecoregion. A wide  
13 variety of wildlife remains in the ecoregion throughout the year.

14 Waterfowl, herons, and shorebirds are among the important bird species in the wetlands of this  
15 ecoregion. They most commonly inhabit open marshes and prairie pothole wetlands (Igl and  
16 Johnson, 1998). Many common mammals, reptiles, and amphibians also make this ecoregion  
17 their home. Examples include the thirteen-lined ground squirrel (*Ictidomys tridecemlineatus*),  
18 pronghorn (*Antilocapra americana*), northern pocket gopher (*Thomomys talpoides*), coyote  
19 (*Canis latrans*), common garter snake (*Thamnophis sirtalis*), northern leopard frog (*Rana*  
20 *pipiens*), and the Great Plains toad (*Bufo cognatus*).

#### 21 **1.6.5 VEGETATIVE HABITAT**

22 Several sections are delineated in this ecoregion: the Palouse Prairie; northwestern Great Plains;  
23 and northern glaciated plains.

24 Grasses, including typical grassland and meadow-steppe vegetation, dominate the Palouse  
25 Prairie. Idaho fescue (*Festuca idahoensis*) and bluebunch wheatgrass (*Pseudoroegneria*  
26 *spicata*) are prominent in the arid western portion. In areas of higher precipitation, Idaho fescue  
27 and common snowberry (*Symphoricarpos albus*) dominate; however, these areas are still too dry  
28 to support forest vegetation on the deep loamy soils. Agricultural crops have replaced much of  
29 the native vegetation of this region.

1 The northwestern Great Plains house a wider array of natural prairie species than other  
2 ecoregions of similar type. Along with the previously mentioned common species are basin  
3 wild-rye (*Elymus cinereus*) and buffalo grass (*Bouteloua dactyloides*). In the more-shallow soils,  
4 side-oats grama (*Bouteloua curtipendula*) may also grow. Buffaloberry (*Shepherdia* spp.),  
5 chokecherry (*Prunus virginiana*), and sagebrush (*Artemisia* spp.) are all common shrubs growing  
6 in draws and along streams. Ponderosa pine (*Pinus ponderosa*), juniper (*Juniperus communis*),  
7 and some aspen may also grow in this area of North Dakota. About 90 percent of this meadow-  
8 steppe and grassland has been converted to cropland.

9 The northern glaciated plains are characterized by a group of grassland species that includes  
10 western wheatgrass (*Pascopyrum smithii*), needle-and-thread (*Hesperostipa comata*), green  
11 needlegrass (*Nassella viridula*), and blue grama (*Bouteloua gracilis*). Areas with sloping or  
12 thinner soils support little bluestem (*Schizachyrium scoparium*). In wetter parcels, prairie  
13 cordgrass (*Spartina pectinata*), northern reedgrass (*Calamagrostis stricta*), and slim sedge  
14 (*Carex acuta*) occur. Western snowberry (*Symphoricarpos occidentalis*) and prairie rose (*Rosa*  
15 *arkansana*) are the common shrubs (McNab and Avers, 1994).

### 16 North Dakota grasslands



17 (National Geographic)  
18

19 Examples of invasive plants include the following species: yellow starthistle (*Centaurea*  
20 *solstitialis*), dyer's woad (*Isatis tinctoria*), flowering rush (*Butomus umbellatus*), Japanese  
21 knotweed complex (*Fallopia japonica*), purple loosestrife (*Lythrum salicaria*), rush  
22 skeletonweed (*Chondrilla juncea*), Eurasian watermilfoil (*Myriophyllum spicatum*), Scotch  
23 broom (*Cytisus scoparius*), curly pondweed (*Potamogeton crispus*), tansy ragwort (*Senecio*  
24 *jacobaea*), meadow hawkweed complex (*Hieracium caespitosum*), orange hawkweed (*Pilosella*  
25 *aurantiaca*), tall buttercup (*Ranunculus acris*), perennial pepperweed (*Lepidium latifolium*),  
26 blueweed (*Echium vulgare*), and hoary alyssum (*Berteroa incana*) (Center for Invasive Plant  
27 Management, 2010). Non-native invasive plant species can negatively affect natural areas,  
28 agriculture, and horticulture (Simberloff, 1996).

### 29 1.6.6 WETLANDS AND WATERWAYS

30 Wetlands within the Great Plains Steppe Ecoregion of the project area include approximately:  
31 6,190 acres of primarily scrub-shrub as opposed to forested swamp; 692,945 acres of emergent

1 wetlands, occurring primarily as depression wetlands; 34,325 acres of ponds; 166,535 acres of  
2 lakes; and 7,875 acres of riverine habitats. Prairie pothole wetlands are the most common type  
3 (USDOI, 2010b).

4 Major rivers within the state of Montana include the Missouri River (a portion of the river in the  
5 project area is protected under the Wild and Scenic Rivers Act, as are the three forks of the  
6 Flathead River). In eastern Montana, close to the North Dakota border, the Missouri River  
7 (though not designated here as Wild and Scenic) lies within 100 miles of the border. The entire  
8 Missouri River, including this section in eastern Montana, is under scrutiny by the Army Corps  
9 of Engineers (Omaha District) to improve its natural functioning through the ACOE's Missouri  
10 River Recovery Program.

11 Several other major rivers cross the Northern Border, including the Milk River in Montana,  
12 which flows north into Canada. After 168 miles, it flows back south across the Northern Border  
13 into eastern Montana. The St. Mary River originates in the alpine areas of Glacier National Park  
14 and flows through several large lakes in Montana and north into Canada. Other major rivers in  
15 the project area include the Marias River in Montana and North Dakota (it flows into the Wild  
16 and Scenic portion of the Missouri River), the Little Muddy and White Earth in North Dakota,  
17 the Yellowstone in both North Dakota and Montana, and the Judith and Teton rivers in Montana.

18 Further east in Montana are Lake Bowdoin on the Bowdoin National Wildlife Reserve and  
19 Medicine Lake, part of the Medicine Lake National Wildlife Refuge. Major reservoirs in  
20 Montana in the project area include the Tiber, Fresno, Lake Frances, and Nelson.

21 **Bowdoin National Wildlife Reserve**



22 (USFWS)  
23

24 **1.6.7 AQUATIC RESOURCES**

25 Several different types of aquatic resources occur across the northern glaciated plains,  
26 northwestern glaciated plains, and northwestern Great Plains of this ecoregion. In the northern  
27 glaciated plains, low-to-medium density, dendritic drainage leads to more complex, high-density  
28 drainage southeast through the northwestern glaciated plains in North Dakota, and into the  
29 northwestern Great Plains of North Dakota and Montana. The high-density, dendritic, drainage  
30 in the northwestern glaciated plains typically occurs in areas of exposed marine shales, leading  
31 towards the northwestern Great Plains where the high-density, first-order streams feed into long,  
32 structurally controlled second and third-order streams with low gradients.

1 The paddlefish (*Polyodon spathula*) is a primary large fish species of concern in the Missouri  
2 River of Montana and North Dakota. The cause of decline for this species is loss of habitat due  
3 to channelization and impoundment.

4 Fishing is important on the major rivers of this region; it is also an important activity on the  
5 reservoirs along the Missouri River, with these species of interest throughout the ecoregion:  
6 walleye (*Sander vitreus*), northern pike (*Esox lucius*), channel catfish (*Ictalurus punctatus*),  
7 smallmouth bass (*Micropterus salmoides*), and paddlefish. Data for walleye at Fort Peck Lake, a  
8 large reservoir on the Missouri River, demonstrate the importance of the fishery. Approximately  
9 40 million young walleyes are stocked in Montana annually (Montana Outdoors, 2006). The  
10 Montana Department of Fish, Wildlife & Parks manages the Fort Peck Reservoir fishery. Nearly  
11 50 species of fish live in the reservoir, most of which are native to the Missouri River. Sixteen  
12 introduced species, mostly game fish, have been planted to enhance the fishing (MTFWP, 2002).

### 13 **1.7 GREAT PLAINS STEPPE ECOREGION (332)**

14 The Great Plains Steppe Ecoregion consists of flat and rolling plains with a relief of less than  
15 300 feet (90 meters) (Figure 1.1-3). Elevations in this ecoregion range between 700 feet (214  
16 meters) and 2,300 feet (704 meters). Glaciers covered this area during parts of the Pleistocene  
17 Epoch.

18 The state in this portion of the ecoregion is North Dakota.

19 The Great Plains Steppe Ecoregion, which encompasses much of central and northern North  
20 Dakota, is covered by nearly level to rolling glacial till and lake plains with steep slopes adjacent  
21 to rivers and streams and areas of pothole lakes. The sub-humid conditions give rise to a broad  
22 region of grassland transitional between tallgrass and short-grass prairie (Bailey, 1995).  
23 Extensive concentrations of temporary and seasonal wetlands create favorable conditions for  
24 waterfowl nesting and migratory stopover habitats. Though the glacial-till-derived soil is quite  
25 fertile, agricultural production varies due to annual climatic fluctuations. Much of the ecoregion  
26 has shifted to agriculture, and relatively few areas of native grassland remain outside of wildlife  
27 refuges or nature preserves—either federally or state-owned or in private ownership, such as The  
28 Nature Conservancy.

29 This ecoregion is intermediate in growing season length, vegetation structure, and rainfall with  
30 drier conditions persisting to the west and the more-moist tallgrass prairie to the east and  
31 southeast. Climate separates this region from the Central and Southern Mixed Grasslands; these  
32 more southerly ecotypes are characterized by warmer climates and longer growing seasons. The  
33 climate in the Great Plains Steppe has warm summers followed by cold winters, much as in the  
34 Great Plains–Palouse Dry Steppe Ecoregion to the west. Average temperatures typically range  
35 between 36 and 45 degrees Fahrenheit (2 to 7 degrees Celsius). Average precipitation in this  
36 area is 15 to 20 inches (38 to 51 centimeters) per year with more than half falling during the 100  
37 to 140-day growing season. The rest of the precipitation usually falls as snow. Naturally  
38 occurring droughts and fires also take place—both of which play important roles in determining  
39 native vegetation (Bailey, 1995).

1

## Bison



2

3

(USFWS)

4 Fire regimes dramatically influenced the original development of northern Great Plains  
5 vegetation. Variation in precipitation across the region also determines the growth and expanse  
6 of trees and shrubs, shaping the grass-dominated native vegetation in areas where agriculture  
7 does not take place. In the short-grass and mixed-grass portions of the region, woody plants are  
8 primarily restricted to areas of higher elevation and areas with higher precipitation, including  
9 both riparian zones and north-facing slopes. Fire suppression has allowed woody plants to  
10 encroach in some areas where they did not exist for many centuries (Higgins et al., 2006).

### 11 **1.7.1 REMAINING BLOCKS OF REGIONALLY SIGNIFICANT HABITAT**

12 The blocks of regionally significant habitat below are relatively undeveloped and intact habitat  
13 protected as wilderness, state parks, and state and national forests. Regionally significant or  
14 intact habitat refers to areas of largely unfragmented habitat with few alterations or  
15 disturbances, such as roads or other development. Most areas listed are protected by law  
16 (wilderness areas, national parks) and often cross state and country boundaries, while others may  
17 occupy large expanses of private lands.

18 Selected regionally significant blocks that represent this region include:

- 19 • Turtle Mountain–Northern North Dakota/southern Manitoba, on the border of the ecoregion;
- 20 • J. Clark Salyer National Wildlife Refuge–North-central North Dakota;
- 21 • Pembina Gorge–Northeastern North Dakota;
- 22 • Mirror Pool Wildlife Management Area–Eastern North Dakota;
- 23 • Oakville Prairie–Eastern North Dakota;
- 24 • Sully’s Hill National Game Preserve–Eastern North Dakota;
- 25 • Forest River Biology Area–Eastern North Dakota; and
- 26 • Gunlogson Arboretum Nature Preserve–Northeastern North Dakota.

1

### Sandhill cranes (*Grus canadensis*)



2

3

(USFWS)

### 4 1.7.2 SENSITIVE HABITATS

5 Within a 100-mile zone adjacent to the U.S.-Canada border are several ecological communities  
 6 that represent sensitive habitats. The sensitive habitats described here occur in many of the  
 7 larger intact habitat areas in the prior section, and are home to many of the threatened and  
 8 endangered species in the next section. For example, Eastern Great Plains Tallgrass Aspen  
 9 Parkland houses protected species, such as the western prairie fringed orchid (*Platanthera*  
 10 *praeclara*), as well as a wide variety of common plant species, such as little bluestem  
 11 (*Schizachyrium scoparium*). The habitat names used below, such as Northwestern Great Plains  
 12 Mixed-grass Prairie, describe habitats found among very diverse areas of regional boundaries  
 13 and represent specific ecological associations.

14

### Tallgrass prairie



15

16

(USFWS)

17 Many of these habitats are very fine in scale and form a patchwork of biologically sensitive and  
 18 diverse areas. The list of sensitive habitats is based on those enumerated and described by the  
 19 World Wildlife Fund (2001), ecological system descriptions within the NatureServe.org  
 20 database, and each state's respective natural resources agency.

- 21 • Northwestern Great Plains Mixed-grass Prairie – Grassland type of medium-height grasses  
 22 on fine-textured and well-drained soils;

- 1 • Eastern Great Plains Tallgrass Aspen Parkland–Mosaic or combination of tallgrass prairie,  
2 brush prairie, aspen-oak mixed woodlands, and wet prairie;
- 3 • Eastern Great Plains Wet Meadow, Prairie and Marsh–Distinguished from upland prairie  
4 systems by having seasonal inundation (wetlands with near-surface groundwater), in  
5 conjunction with silty, dense-clay, often hydric soils; and
- 6 • Great Plains Sand Prairie–Often considered part of the tallgrass or mixed-grass regions in the  
7 Great Plains, with a mixture of elements from the Western Great Plains Short-grass Prairie,  
8 Central Mixed-grass Prairie, and Northwestern Great Plains Mixed-grass Prairie and soils  
9 derived from sandstone weathering.

10 Few extensive areas of native grassland still exist and these are relatively small compared to their  
11 original extent; for these reasons alone, the grasslands are threatened and of high ecological  
12 value. Conversion of native grassland to agriculture has been widespread throughout all Great  
13 Plains regions (WWF, 2001).

### 14 **1.7.3 THREATENED AND ENDANGERED SPECIES**

15 Appendix F3 lists the threatened and endangered species within this ecoregion. Many important  
16 grassland and wetland habitat species are sensitive to disturbance, including the whooping crane  
17 (*Grus americana*), peregrine falcon (*Falco peregrines*), and the Nelson’s sharp-tailed sparrow  
18 (*Ammodramus nelsoni*).

19

#### **Nelson’s sharp-tailed sparrow**



20

21

(Avian Research & Education Institute)

22 The gray wolf (*Canis lupus*) is an example of a rare species in North Dakota. Since this wolf is a  
23 federally listed species and is designated a rare Level III species in North Dakota, national  
24 forests and wildlife refuges already have plans in place for monitoring or recovery of wolf  
25 populations (or both). These plans are on the North Dakota Game and Fish Department website.

26 North Dakota uses a system that ranks species by the greatest need of conservation from Level I  
27 (greatest need) to Level III (moderate need). Within these ranks, North Dakota also designates  
28 the abundance of these species as rare, uncommon, fairly common, common, or abundant. Some  
29 federally endangered and threatened species may be listed in Level I, II, or III, depending on the  
30 current funding and recovery plan status of that particular species. For example, the piping

1 plover is listed as a Level II uncommon species in North Dakota, meaning that it has a recovery  
2 plan in effect, but still has a moderate to high priority of conservation.

### 3 **1.7.4 WILDLIFE**

4 Many birds, especially insectivorous species, migrate through this ecoregion twice each year.  
5 Some species, such as the greater prairie-chicken (*Tympanuchus cupido*), are year-round  
6 permanent residents. While the greater prairie-chicken is not threatened or endangered in North  
7 Dakota, it is an important bird in this ecoregion, with its populations in flux. An experimental  
8 hunting season has been held periodically, although it was closed for 2010. The wetlands and  
9 prairie grasslands in this ecoregion are home to a variety of wildlife, including both game  
10 (legally hunted) and non-game (legally protected but not endangered or threatened and not  
11 hunted) species.

12 Large game animals, such as deer, moose (*Alces alces*), elk (*Cervus canadensis*), and mountain  
13 lion (*Felis concolor*), live in this ecoregion. The long-eared myotis bat (*Myotis evotis*), long-  
14 legged myotis bat (*M. volans*), northern prairie skink (*Eumeces septentrionalis*), silver chub  
15 (*Macrhybopsis storeriana*), pearl dace (*Margariscus margarita*), northern redbelly snake  
16 (*Storeria occipitomaculata*), yellow rail (*Coturnicops noveboracensis*), black-billed cuckoo  
17 (*Coccyzus erythrophthalmus*), and red-headed woodpecker (*Melanerpes erythrocephalus*) are  
18 other sensitive species in this ecoregion.

### 19 **1.7.5 VEGETATIVE HABITAT**

20 Vegetative cover within the Great Plains Steppe Ecoregion is dominated by nearly level and  
21 rolling plains habitats. Most of this land consists of young glacial drift and dissected till plains.  
22 Typical vegetative cover consists of various tall and short grasses, including little bluestem  
23 (*Schizachyrium scoparium*) and blue grama (*Bouteloua gracilis*). Other species include  
24 buffalograss (*Bouteloua dactyloides*), needle-and-thread grass (*Hesperostipa comata*), galleta  
25 (*Pleuraphis jamesii*), sunflower (*Helianthus annuus*), and goldenrods (*Solidago* spp.). Wetlands  
26 in this ecoregion include pothole lakes and streams where Kentucky bluegrass (*Poa pratensis*),  
27 Canada anemone (*Anemone canadensis*), and northern reedgrass (*Calamagrostis stricta*) thrive  
28 (Stewart and Kantrudi, 1972).

1

## Sunflower



2

3

(Missouri Plants)

4 Common invasive species of concern include saltcedar (*Tamarix* spp.), garlic mustard (*Alliaria*  
 5 *petiolata*), Eurasian water-milfoil (*Myriophyllum spicatum*), Russian knapweed (*Acroptilon*  
 6 *repens*), spotted knapweed (*Centaurea maculosa*), bull thistle (*Cirsium vulgare*), yellow sweet  
 7 clover (*Melilotus officinalis*), reed canary grass (*Phalaris arundinacea*), curly pondweed  
 8 (*Potamogeton crispus*), Siberian elm (*Ulmus pumila*), puncturevine (*Tribulus terrestris*), and  
 9 black medic (*Medicago lupulina*) among others. New invasive species likely to become  
 10 problems include orange hawkweed (*Pilosella aurantiaca*), meadow hawkweed (*Hieracium*  
 11 *caespitosum*), two-leaf water-milfoil (*M. heterophyllum*), buckthorn (*Rhamnus* spp.), hybrid  
 12 cattail (*Typha angustifolia*), Japanese knotweed (*Fallopia japonica*), and giant knotweed  
 13 (*Fallopia sachalinensis*) (Center for Invasive Plant Management, 2010; USDA, 2003a). The  
 14 North Dakota Century Code lists at least seven noxious weeds in northern North Dakota  
 15 counties, including Canada thistle (*Cirsium arvense*), leafy spurge (*Euphorbia esula*), Russian  
 16 knapweed, and spotted knapweed.

### 17 **1.7.6 WETLANDS AND WATERWAYS**

18 Wetlands within the Great Plains Steppe Ecoregion portion of the project area include  
 19 approximately: 6,190 acres of primarily scrub-shrub as opposed to forested swamp; 692,945  
 20 acres of emergent wetlands, occurring primarily as depression wetlands; 34,325 acres of ponds;  
 21 166,535 acres of lakes; and 7,875 acres of riverine habitats. Prairie pothole wetlands are the  
 22 most common type (USDOI, 2010b).

1

### Yellow-headed blackbird



2

3

(USFWS)

4

Of the relatively few major rivers in the ecoregion, the Des Lacs, Souris, and Sheyenne are the largest. Devils Lake, the largest lake in the 100-mile section south of the Northern Border, remains important to nesting wetland birds, especially the American white pelican (*Pelecanus erythrorhynchos*), which has a very large nesting colony here.

8

#### 1.7.7 AQUATIC RESOURCES

9

10

11

Aquatic resources are highly regarded within the Great Plains Steppe Ecoregion, luring hunters, anglers, and camping enthusiasts from all over the United States due to the abundance of ducks and other waterfowl.

12

13

14

15

The aquatic resources of the ecoregion support a diverse fishery. Notable fish species include walleye (*Sander vitreus*), perch (*Perca* spp.), and paddlefish (*Poloyodon spathula*). Various native reptiles, amphibians, water birds, aquatic insects, mussels, and crustaceans also thrive in these waters.

16

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27

Accidental introductions of invasive species create negative impacts on aquatic resources, damaging fisheries and native habitats. Common invasive aquatic plant species of concern include two-leaf water-milfoil (*Myriophyllum heterophyllum*), Eurasian water-milfoil (*M. spicatum*), hybrid cattail (*Typha xglauca*), reed canary grass (*Phalaris arundinacea*), curly pondweed (*Potamogeton crispus*), and Brazilian waterweed (also known as Brazilian elodea, *Egeria densa*). Invasive animal species of concern, called aquatic nuisance species (ANS), listed in North Dakota, include the grass carp (*Ctenopharyngodon idella*), common carp (*Cyprinus carpio*), and rusty crayfish (*Orconectes rusticus*). The North Dakota Game and Fish Department also lists several species found close to North Dakota currently being watched for in wetlands, rivers, and lakes. These species include the round goby (*Neogobius melanostomus*), silver carp (*Hypophthalmichthys molitrix*), Asian clam (*Corbicula fulminea*), and spiny water flea (*Bythotrephes longimanus*) (USDA, 2003b).

28

#### 1.8 PRAIRIE PARKLAND (TEMPERATE) ECOREGION (251)

29

30

The Prairie Parkland (Temperate) Ecoregion is a formerly glaciated area with gently rolling plains and steep bluffs bordering the valleys (Figure 1.1-3). Most of this area consists of

1 alternating prairie and deciduous forest. Elevation ranges from 825 to 1,150 feet (250 to 350  
2 meters) with a local relief of 3 to 25 feet (1 to 8 meters).

3 States in this ecoregion include Minnesota and North Dakota.

4 The Prairie Parkland (Temperate) Ecoregion has areas of intermingled prairie with deciduous  
5 forests near streams and on north-facing slopes. The forest cover consists of an oak-hickory  
6 association and prairies composed primarily of grasses. Aquatic resources include streams,  
7 wetlands, and dunes with a few lakes. Part of this province has limestone bedrock covered by  
8 thin soils that do not support tree growth; however, the floodplains and moist hillsides can  
9 support deciduous forests. Tall grasses are prominent and usually grow in bunches. Many of the  
10 prairies in this ecoregion appear to be areas that have not yet become forested. The Red River  
11 Valley, adjacent to the Red River separating Minnesota from North Dakota, has alluvial fans in  
12 the west where rivers once entered the glacial lakes. Beach and moraine ridges border the east.

13 Agriculture is the primary economic activity in this ecoregion and has replaced most areas of  
14 native prairie. The Red River Valley contains fertile soils, the building blocks of which were  
15 deposited by meltwater from Glacial Lake Agassiz. In the till plains, especially in the central  
16 dissected areas, about half of the land has been altered for agricultural use.

17 Summers are usually hot in the Red River Valley; the winters are particularly cold. The mean  
18 annual temperature ranges from 36 to 45 degrees Fahrenheit (2 to 7 degrees Celsius) with an  
19 average of 18 to 23 inches (47 to 58 centimeters) of precipitation. About 40 percent of this falls  
20 during the 111 to 136-day growing period. Precipitation during winter comes almost entirely  
21 from snow.

### 22 **1.8.1 REMAINING BLOCKS OF REGIONALLY SIGNIFICANT HABITAT**

23 The blocks of regionally significant habitat below are relatively undeveloped and intact habitat  
24 protected as wilderness, state parks, and state and national forests. Regionally significant or  
25 intact habitat refers to areas of largely unfragmented habitat with few alterations or  
26 disturbances, such as roads or other development. Most areas listed are protected by law  
27 (wilderness areas, national parks) and often cross state and country boundaries, while others may  
28 occupy large expanses of private lands.

29 In this province, no large blocks of intact habitat remain in this ecoregion within 100 miles of the  
30 Northern Border. Most original native tallgrass prairies have been converted to cropland. A few  
31 areas of limited size include:

- 32 • Agassiz Beach Ridges—Northwestern Minnesota, fragmented glacial lake ridges;
- 33 • Pembina Trail Preserve—Western Minnesota; and
- 34 • Malmberg Prairie—Western Minnesota.

### 35 **1.8.2 SENSITIVE HABITATS**

36 Within a 100-mile zone adjacent to the U.S.-Canada border are several ecological communities  
37 representing sensitive habitats. The sensitive habitats described here occur in many of the larger  
38 intact habitat areas in the prior section and are home to many of the threatened and endangered

1 species in the next section. For example, prairie potholes occur in many grassy areas in this  
2 geographic region and house species such as the big bluestem (*Andropogon gerardii*) and Indian  
3 grass (*Sorghastrum nutans*). Some habitat names used below, such as wooded areas, describe  
4 habitats found across regional boundaries and are more general in meaning. Others, such as the  
5 Red River Valley shoreline (an area of fertile soils), define much more specific ecological  
6 associations.

7 Many of these habitats are very fine in scale and form a patchwork of biologically sensitive and  
8 diverse areas. The list of sensitive habitats is based on those enumerated and described by the  
9 World Wildlife Fund (2001), ecological system descriptions within the NatureServe.org  
10 database, and each state’s respective natural resources agency.

- 11 • The Red River Valley shoreline—Area of fertile soils adjacent to the Red River that is  
12 subject to flooding;
- 13 • Prairie Potholes—Water-holding depressions of glacial origin, primary wetland habitat;
- 14 • Wooded areas—Commonly found on moist hillsides;
- 15 • Shorelines/dunes/cliffs/talus/rock outcrops—Sparsely vegetated native plant communities;
- 16 • Icelandic State Park—North Dakota; and
- 17 • Bluestem Prairie Scientific and Natural Area—Native prairie that once covered a large  
18 area of western Minnesota and the Dakotas (The Nature Conservancy, 2010c).

19 **An aerial view of prairie potholes**



20 (NASA)  
21

22 **1.8.3 THREATENED AND ENDANGERED SPECIES**

23 Appendix F3 lists the threatened and endangered species within this ecoregional province.

24 Additional wildlife species sensitive to habitat loss include the whooping crane (*Grus*  
25 *americana*), piping plover (*Charadrius melodus*), loggerhead shrike (*Lanius ludovicianus*), and  
26 burrowing owl (*Athene cunicularia*), gray wolf (*Canis lupus*), and Canada lynx (*Lynx*  
27 *canadensis*), along with an array of invertebrate, mussel, and plant species. The piping plover is  
28 an example of a species with existing plans for monitoring or recovery. Both North Dakota and

1 Minnesota list this bird as a federally threatened species since it is not part of the Great Lakes  
2 watershed in this ecoregion.

3 North Dakota uses a different system to rank species in greatest need of conservation from Level  
4 I (greatest need) to Level III (moderate need). Within these ranks, North Dakota also states the  
5 abundance of the species as rare, uncommon, fairly common, common, and abundant. Some  
6 federally endangered or threatened species may be listed in Level I, II, or III, depending on the  
7 current funding and recovery plan status of that particular species. For example, the piping  
8 plover is a Level II uncommon species in North Dakota, meaning it has a recovery plan in effect,  
9 but still has a moderate to high priority of conservation.

#### 10 **1.8.4 WILDLIFE**

11 Many birds, especially waterfowl such as the northern pintail (*Anas acuta*), green-winged teal (*A.*  
12 *crecca*), and American wigeon (*A. americana*), and songbirds, such as the chestnut-collared  
13 longspur (*Calcarius ornatus*), migrate through this province twice each year. Some other birds,  
14 mammals, reptiles, and amphibians remain in the province year-round. Species such as the  
15 canvasback (*Aythya valisineria*), while not threatened or endangered in Minnesota or North  
16 Dakota, could be affected by diminishing wetland habitat. The prairie pothole wetlands and  
17 grasslands in this ecoregion are home to a variety of wildlife species, including both game  
18 (legally hunted) and non-game (legally protected but not endangered or threatened and not  
19 hunted) species. Hunting remains an important economic activity (North Dakota Game and Fish  
20 Department, 2010).

21 Although not listed as endangered or threatened at either the Federal or state level, some rare or  
22 non-endangered or threatened species are categorized differently. Those species of  
23 “conservation concern” or “special concern” are potentially highly vulnerable to some activities.  
24 The marbled godwit (*Limosa fedoa*), black tern (*Chlidonias niger*), loggerhead shrike (*Lanius*  
25 *ludovicianus*), northern goshawk (*Accipiter gentilis*), and black-backed woodpecker (*Picoides*  
26 *arcticus*), lake sturgeon (*Acipenser fulvescens*), gophersnake (*Pituophis catenifer*), and the plains  
27 pocket gopher (*Geomys bursarius*) are some of these sensitive species.

28

#### **Black tern**



29  
30

(Idaho Fish and Game)

31 Many fish, mammals, reptiles, and amphibians live in these areas, as well. The river otter  
32 (*Lontra canadensis*), white-tailed deer (*Odocoileus virginianus*), channel catfish (*Ictalurus*

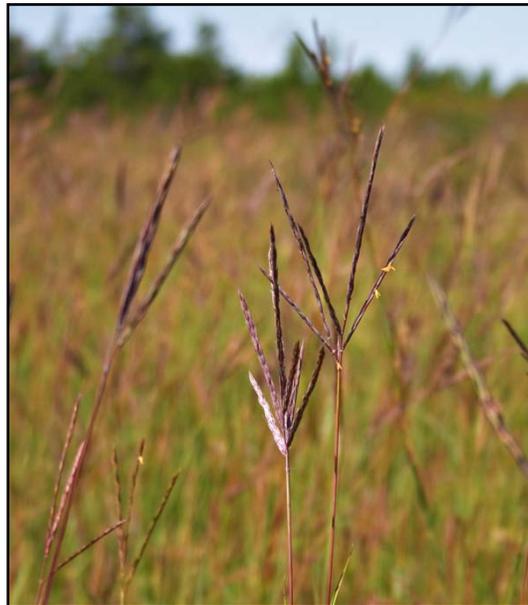
1 *punctatus*), lake sturgeon (*Acipenser fulvescens*), Canadian Toad (*Bufo hemiophrys*), common  
2 snapping turtle (*Chelydra serpentina*), and the northern redbelly snake (*Storeria*  
3 *occipitamaculata*) are representative.

#### 4 **1.8.5 VEGETATIVE HABITAT**

5 Vegetative cover within the Prairie Parkland (Temperate) Province is dominated by tallgrass  
6 prairie and some riparian deciduous forest habitats in areas where native plants persist. Typical  
7 grassland cover includes big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium*  
8 *scoparium*), switchgrass (*Panicum virgatum*), and Indian grass (*Sorghastrum nutans*). Extensive  
9 areas of prairie-pothole wetlands and oak-hickory forests still remain. The original vegetation  
10 was primarily a mosaic of bluestem-dominated prairie grassland and oak-hickory forest, with the  
11 oak-hickory forest growing along rivers and streams. An estimated 60 percent of the land  
12 surface was bluestem (tallgrass) prairie, with bur oak (*Quercus macrocarpa*) and white oak  
13 (*Quercus alba*) savannas interspersed and in transitional areas. Upland forest (white oak-  
14 shagbark hickory) occurred on more-dissected land, grading into bottomland forests and wet  
15 bottomland prairies along rivers.

16

#### **Big bluestem**



17  
18

(University of British Columbia Botanical Garden)

19 Glacial Lake Agassiz was the last in a series of pro-glacial lakes to fill the Red River Valley.  
20 Thick beds of lake sediments on top of glacial till created the flat Lake Agassiz plain. Intensive  
21 row-crop agriculture has replaced the historic tallgrass prairie. The Red River Valley drains to  
22 the north; the area is flat, dry, and quite fire prone. Wooded communities grow only in the  
23 deepest river valleys. Marsh and wet meadow communities occupy river bottoms and shallow  
24 depressions.

25 Examples of invasive species of concern that cause problems for the natural biodiversity in this  
26 ecoregion include Russian knapweed (*Acroptilon repens*), absinth wormwood (*Artemisia*  
27 *absinthium*), Canada thistle (*Cirsium arvense*), musk thistle (also known as nodding thistle,

1 *Carduus nutans*), flowering rush (*Butomus umbellatus*), purple loosestrife (*Lythrum salicaria*),  
2 leafy spurge (*Euphorbia esula*), yellow star-thistle (*Centaurea solstitialis*), diffuse knapweed  
3 (*Centaurea diffusa*), dalmatian toadflax (*Linaria vulgaris*), and spotted knapweed (*C. maculosa*).  
4 Some new invasive species are Brazilian elodea (also known as Brazilian waterweed, *Egeria*  
5 *densa*), Eurasian water-milfoil (*Myriophyllum spicatum*), and yellow flag iris (*Iris pseudoacorus*)  
6 (Center for Invasive Plant Management, 2010; MNDNR, 2009; NRCS, 2003). Non-native  
7 invasive plant species can affect natural areas, agriculture, forestry, and horticulture negatively  
8 (Simberloff, 1996). Invasive aquatic species pose a similar threat to aquatic resources (USDA,  
9 2010).

## 10 **1.8.6 WETLANDS AND WATERWAYS**

11 Wetlands within the Prairie Parkland Temperate Ecoregion portion of the project area include  
12 approximately: 89,245 acres of forested and scrub-shrub wetlands; 72,635 acres of emergent  
13 wetlands; 39,450 acres of lakes; 13,330 acres of ponds; and 33,845 acres of riverine habitats  
14 (USDOI, 2010b). The wetlands are generally smaller and scattered, sitting in isolated  
15 depressions known as prairie potholes. Swamps tend to be scrub-shrub swamps rather than  
16 forested.

17

### **Scrub-shrub wetland**



18  
19

(Wisconsin Dept. of Natural Resources)

20 This region has high concentrations of temporary and seasonal emergent pothole and kettle  
21 wetlands that create favorable conditions for duck nesting and migration (Bryce et al., 1996;  
22 Woods et al., 2002). Flat plains with lakes, pothole and kettle wetlands, and ponds occur in the  
23 area to the west of the Red River Valley.

## 24 **1.8.7 AQUATIC RESOURCES**

25 Aquatic resources are highly regarded within the Prairie Parkland (Temperate) Ecoregion.  
26 Wetlands with rivers and tributaries, along with small lakes, form the dominant aquatic features  
27 of this landscape. Many of the original wetlands in this area, however, have been drained for  
28 agricultural use. The remaining resources lure hunting and fishing enthusiasts. Many migratory  
29 game bird species also use the Red River Valley; abundant fish live in the Red River. Mollusks

1 are well represented in the aquatic habitats (Northern Prairie Wildlife Resource Center, 2006)  
2 with 44 species accounted for with mapped ranges.

3 These aquatic resources support a diverse fishery. Notable fish species include channel catfish  
4 (*Ictalurus punctatus*), walleye (*Sander vitreus*), largemouth bass (*Micropterus salmoides*), rock  
5 bass (*Ambloplites rupestris*), and lake sturgeon (*Acipenser fulvescens*). The Red River has  
6 become internationally renowned for its trophy-size catfish. International anglers also fish for  
7 carp, a common and highly desirable game fish in many parts of the world. A variety of native  
8 reptiles, amphibians, birds, aquatic insects, mussels, and crustaceans also thrive in and around  
9 these waters. The Canadian toad (*Bufo hemiophrys*), snapping turtle (*Chelydra serpentina*),  
10 northern prairie skink (*Eumeces septentrionalis*), smooth green snake (*Opheodrys vernalis*),  
11 silver-spotted skipper (*Hesperia comma*), sleepy duskywing (*Erynnis propertius*), great blue  
12 heron (*Ardea herodias*), killdeer (*Charadrius vociferous*), three-ridge mussel (*Amblema*  
13 *neislerii*), and giant floater mussel (*Pyganodon grandis*) are all species of aquatic habitats in this  
14 area, especially around the Red River.

15

### Snapping turtle



16  
17

(USGS)

18 Common invasive plant species of concern include Eurasian water-milfoil (*Myriophyllum*  
19 *spicatum*), reed canary grass (*Phalaris arundinacea*), curly pondweed (*Potamogeton crispus*),  
20 and flowering rush (*Butomus umbellatus*). Invasive animal species of concern may include zebra  
21 mussel (*Dreissena polymorpha*) (recently found in the Red River, although south of the 100-mile  
22 buffer area) goldfish (*Carassius auratus auratus*), and rusty crayfish (*Orconectes rusticus*)  
23 among others.

24