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## 2.9 Fish and Wildlife Resources

### 2.9.1 Pre-Mining Fish and Wildlife Inventory

#### 2.9.1.1 Introduction

In accordance with Section 69-05.2-08-15 of the North Dakota Administrative Code (NDAC), the primary objective of the inventory was to characterize the fish and wildlife resources within the vicinity of the South Heart Lignite Mine (SHLM) sufficiently to design the protection and enhancement plan required in Section 69-05.2-09-17.

Specific survey objectives were:

- Classify and map fish and wildlife habitats in the Study Area. For the purposes of the Scope of Work (SOW) submitted to the Public Service Commission (PSC) in early November 2006, a preliminary habitat map was prepared at a scale of 1:24,000 through field reconnaissance and aerial photography interpretation in spring and summer 2006, based on a combination of vegetation communities, land use, and physical features. The preliminary map was used to identify wildlife sightings by habitat throughout the field study. A final habitat map of the Study Area was prepared at a scale of 1:6,000, a scale approved by the PSC for the SHLM.
- Develop site-specific information needed to address the potential occurrence of species and habitats to include:
  - Listed or proposed endangered or threatened species or their critical habitats listed by the Secretary of the U.S. Department of Interior under the Endangered Species Act of 1973, as amended. The following three species were identified by the U.S. Fish and Wildlife Service (USFWS) for Stark County, North Dakota (USFWS 2007a):
    - Listed threatened species: the bald eagle (*Haliaeetus leucocephalus*). Although still included on the USFWS (2007a) site in September 2007, the bald eagle was delisted in late June 2007; and
    - Listed endangered species: the black-footed ferret (*Mustela nigripes*) and the whooping crane (*Grus americana*).
  - Habitats of unusually high value for fish and wildlife such as important streams, wetlands, riparian areas, cliffs supporting raptors, areas offering special shelter or protection, migration routes, or reproduction and wintering

areas. These habitats/areas were identified using specific methods discussed in Section 2.9.1.3; and

- Other species groups or habitats identified through consultation with PSC or other agencies. These species groups included raptors, game animals and passerine birds.

In accordance with:

- Section 69-05.208-15(1), NDAC. The SOW for the fish and wildlife resources information was submitted to the PSC in early November 2006. The SOW was prepared after a site visit and discussions with PSC personnel in May 2006, field reconnaissance of the Study Area and development of a preliminary wildlife habitat map for inclusion in the SOW. The SOW was submitted to PSC, North Dakota Game and Fish Department (NDGFD) and USFWS for review. Comments were received on January 16, 2007 and incorporated into a revised SOW. Correspondence from PSC and other agencies regarding the SOW is included in [Appendix 2.9-1](#).
- Section 69-05.2-08-15(2), NDAC. A fish and wildlife habitat map was developed at a scale of 1:6000 ([Exhibit 2.9-1A](#), [Exhibit 2.9-1B](#), [Exhibit 2.9-1C](#), and [Exhibit 2.9-1D](#)).
- Section 69-05.2-08-15(3), NDAC. This report summarizes site-specific fish and wildlife resources, including listed or proposed endangered or threatened animal species and their designated critical habitats, and fish and wildlife habitats of unusually high value.
- Section 69-05.2-09-17, NDAC. This section of the application includes a Fish and Wildlife Resources Protection and Enhancement Plan and a Fish and Wildlife Resources Monitoring Plan.

### 2.9.1.2 *Methods*

#### 2.9.1.2.1 Delineation of the Study Area

The area studied for the fish and wildlife resources inventory was comprised of the Primary Study Area and the Secondary Study Area as shown on [Figure 2.9-1](#). The Primary Study Area includes the Permit Boundary. The Secondary Study Area includes a 0.5-mile buffer around the Primary Study Area, as requested by the PSC. The Total Study Area, hereinafter referred to as the Study Area, includes the Primary and Secondary Study Areas. The land surface in the Study Area was privately owned. Surface access was available in the Primary Study Area but was not necessarily available in the Secondary Study Area. Consequently, all study methods that required access on private lands

were confined to the Primary Study Area, while methods that could be accomplished from public roads or rights-of-way, such as general observations and roadside surveys, were employed in both study areas. Results for the fish and wildlife baseline Study Area are summarized in Section 2.9.1.4.1.

#### 2.9.1.2.2 Fish

Because the South Branch Heart River and the Heart River have limited fisheries value (Berard 2006), no quantitative sampling was proposed in the SOW. Rather, fisheries were examined through literature review (development of potential species lists based on information supplied by the NDGFD and other sources) and qualitative field analysis. Reaches of the South Branch Heart River within the Study Area were walked, and notes were recorded on channel width, sinuosity and instream habitat. An attempt was made to qualitatively sample fish at selected sites along the South Branch Heart River with dip nets and minnow seines in June 2007, but was unsuccessful due to the extremely muddy substrate of this stream, which made sampling very difficult. However, black bullhead fry were observed in pools of the South Branch Heart River in 2006, and a common carp was observed from a bridge over the Heart River just north of the Primary Study Area.

#### 2.9.1.2.3 Wildlife

##### Species Lists/Incidental Observations

Lists of fish and wildlife species that potentially occur in the Study Area were derived from sources including:

- Breeding Birds of North Dakota (Stewart 1975);
- North Dakota Parks and Recreation Department, Natural Heritage Inventory (NDPRD 2006);
- North Dakota Game and Fish Department (Grondahl no date, Grondahl and Schumacher no date, Hoberg and Gause no date);
- U.S. Department of Interior Bureau of Land Management (BLM)(Rich no date); and

- U.S. Department of Agriculture Forest Service (USFS) (Svingen and Martin 2004).

Throughout field work, all fish and wildlife species were recorded by the habitat in which they (or their evidence) were observed. These records provided total species richness for the Study Area, species richness by habitat, seasonal occurrence of wildlife (e.g., migrants, breeding season residents, year-round residents), and were used to compare existing and potential value of habitats to wildlife.

#### Habitat Map/Habitat Use

As discussed above, a preliminary habitat map was prepared for the Primary Study Area for use in the SOW, based on a combination of vegetation types, land use, and physical features. During field work the habitat map was expanded to include the 0.5-mile buffer in the Secondary Study Area.

An overview of the wildlife habitat and sightings within the Study Area are shown on [Figure 2.9-1](#). The final habitat map for the Study Area ([Exhibit 2.9-1A](#), [Exhibit 2.9-1B](#), [Exhibit 2.9-1C](#), and [Exhibit 2.9-1D](#)) partly utilized the vegetation type map developed from ecological site descriptions ([Section 2.7.2](#)). Mapping accuracy in the Secondary Study Area was assumed to be considerably less than within the Primary Study Area because no ecological site descriptions were available for the 0.5-mile buffer, and therefore wildlife habitat types in the Secondary Study Area were mapped solely from interpretation of aerial photographs. In addition, not all of the Secondary Study Area was covered by the 2006 aerial photography commissioned for the SHLM. Consequently, these gaps were filled with 2004 aerial photography available from other sources. In some cases, it was not possible to differentiate certain habitats (e.g., type 520 Crop and type 530 Tame Pasture/Conservation Reserve Program (CRP)) on these photographs.

To define habitat types, the vegetation types were grouped into wildlife habitat types developed by WESTECH as shown in [Table 2.9-2](#) (WESTECH 1993). The system used by WESTECH was derived from the Wildlife Vegetation Classification System (Coenenberg et al. 1977) and defines habitat types primarily by a combination of dominant species, vertical structure of the habitat, and miscellaneous features. The wildlife habitat map was based on the vegetation map in order to provide consistency between the two studies. However, ecological site mapping did not define wildlife habitat types such as 222 silver sagebrush and 310 mesic shrub drainage, since these ecological sites were based on soils rather than the vegetation community.

During review of the SOW ([Appendix 2.9-1](#)), PSC recommended that the description of habitats include a comparison of the existing and potential value of those habitats to fish and wildlife resources. Therefore, qualitative impressions of existing habitat quality and potential habitat quality were noted during field work; sampling was not designed to provide statistically valid data (e.g., Ratti and Garton 1994). These impressions were combined with data on species richness by habitat type, as well as results from site specific methods to provide a comparison of existing versus (vs.) potential habitat quality for fish and wildlife.

For the purposes of this study, “habitat use” was defined as an observation of a species in or over a habitat, even though the individual animal might only be in transit. Throughout field work, all fish and wildlife species were recorded by the habitat in which they (or their evidence such as tracks, hair, droppings, bones or feathers) were first observed. For example, a white-tailed deer first sighted in a CRP field was recorded as being in that habitat, even though the animal may have then moved into an adjoining crop field.

#### Endangered or Threatened Species

The federal list of endangered or threatened species for Stark County (USFWS 2007a) includes three species: bald eagle (*Haliaeetus leucocephalus*; listed threatened), black-footed ferret (*Mustela nigripes*; listed endangered) and whooping crane (*Grus americana*; listed endangered). However, this list was last updated in December 2006, and the bald eagle was delisted in late June 2007.

No endangered or threatened species were observed during field surveys. If any of these species had been discovered, they would have been recorded and mapped. Sightings of species that would have been completely unexpected in the Study Area (e.g., black-footed ferret) would have been reported immediately to the PSC, NDGFD and the USFWS. For species that might be expected to occur occasionally (e.g., migrating bald eagles), repeated sightings (i.e., consistent use of the Study Area) would have been reported as soon as consistent use had been established.

Historical records of endangered or threatened species within 20 miles of the Study Area, as well as other species of state or federal interest, were obtained and reviewed from NDPRD (NDPRD 2006).

### Big Game

Big game animals in North Dakota are defined as deer, moose, elk, bighorn sheep, mountains goats and antelope (North Dakota Century Code (NDCC) 20.1-01-02). All big game animals sighted during the baseline study were recorded by species, time of day, habitat, number, gender and age class (if possible), and activity. All sightings were mapped on base topographic maps or aerial photographs.

### Furbearers

The NDCC 20.1-01-02 defines furbearers as mink, muskrat, weasel, wolverine, otter, marten, fisher, kit or swift fox, beaver, raccoon, badger, wolf, coyote, bobcat, lynx, mountain lion, black bear and red or gray foxes. All furbearers sighted during the baseline study were recorded by species, time of day, habitat, number, gender and age class (if possible), and activity. All sightings were mapped on base topographic maps or aerial photographs.

### Game Birds

Under NDCC 20.1-01-02, game birds are defined as geese, brant, swans, ducks, plovers, snipes, woodcock, grouse, sagehens, pheasants, Hungarian partridges, quail, cranes, rails, coots, wild turkeys, mourning doves and crows. For the purposes of this study, this grouping was divided into two: birds associated with water (discussed in Aquatic Habitats) and upland game birds.

Upland game birds were surveyed using a combination of incidental observations, pedestrian surveys and roadside surveys. Throughout field work, all sightings of upland game birds were recorded by date, time of day, species, habitat, number, gender and age class (if possible), and activity, and were mapped on base topographic maps or aerial photographs.

Incidental observations were sightings recorded during other fish and wildlife survey activities that did not involve pedestrian or roadside surveys, landowner reports, and wildlife observations recorded by other resource specialists during field activities conducted within the Study Area.

Pedestrian surveys consisted of an observer walking opportunistically through habitats of particular interest, such as deciduous streambank, native grassland, shelterbelts and CRP fields. These surveys



were used to record wildlife occurrence and habitat use, locate raptor nests, identify sites of comparatively important wildlife use or value, and identify potential habitats for unobtrusive species.

Roadside surveys consisted of driving public roads and rights-of-way (ROWS) for the following:

- Lek surveys: sharp-tailed grouse breeding displays usually take place at leks (display sites) from late March to early June, with the peak from mid-April to mid-May. On calm days, displaying male sharp-tailed grouse can be heard at distances up to one mile. Consequently a series of roadside survey points were established in and near the Study Area to detect displaying sharp-tailed grouse ([Figure 2.9-2](#)) in spring 2007. Twelve points were located within the Primary and Secondary Study Areas, with five points placed in the northern third of the area where there was more native grassland habitat (i.e., habitat where sharp-tailed grouse leks would be expected), and three points placed in the southern portion of the Study Area where CRP fields predominated the habitat. In addition, 13 points were located outside the Study Area, primarily to the west ([Figure 2.9-2](#)). These points could be useful for long-term comparisons between habitats that might be affected, and habitats that would not be affected by future development or activities.

Roadside surveys for grouse leks were conducted from ½-hour before to two hours after sunrise on May 3 and 4, 2007, with 10-minute stops at one mile intervals to listen for displaying grouse. No displaying sharp-tailed grouse were heard. However, if any leks had been discovered, they would have been mapped on base topographic maps or aerial photographs, and described in detailed field notes including, but not limited to, vegetation at the site, number of displaying male birds, and numbers of hens. Any leks on accessible sites would have been visited and photographed, and/or mapped in field notes.

- Wild turkey display counts: the locations of displaying male turkeys were triangulated and mapped during roadside surveys in March, May and early June 2007.
- Ring-necked pheasant crowing counts: the 25 roadside survey points were monitored for displaying male ring-necked pheasants from ½-hour before to two hours after sunrise on May 4, and on June 1, 3 and 4, 2007, with two-minute stops at one mile intervals to listen for displaying male ring-necked pheasants. The locations of as many displaying male pheasants as possible were triangulated and mapped. In addition, locations of displaying male ring-necked pheasants within the Study Area were mapped on June 13 through June 15, 2007.
- Gray partridge pairs were recorded and mapped when seen during roadside surveys in May and June, 2007.
- Mourning dove call counts: Dove “coo” calls were recorded for three minutes at each roadside stop (Dolton 1993) on June 1, 3 and 4, 2007.

- Game bird production (brood) counts: the field work schedule ([Table 2.9-1](#)) precluded game bird production counts by roadside surveys in the same year (2007) that spring breeding surveys were conducted. However, broods were counted when observed in August and September 2006.

### Raptors

For the purposes of this study, raptors were considered to be vultures, eagles, hawks, falcons and owls. All raptor sightings were recorded by species, time of day, habitat, number, gender and age class (if possible), and activity, and were mapped on base topographic maps or aerial photographs.

Breeding owl surveys were conducted on February 23 and 24, March 16, May 3 and June 3 by driving accessible roads at night and listening for displaying owls. Locations of displaying birds were triangulated and mapped as closely as practicable, and these sites were visited during daylight hours to locate nests, if possible.

Wooded habitats (particularly deciduous streambank habitat along drainages, and shelterbelts/tree rows where accessible) were walked to locate raptor stick nests. Special attention was given to areas with repeated sightings of adult birds.

No surveys were conducted for ground nesting species such as the northern harrier. If adult birds were observed landing in accessible areas, such as CRP fields, these sites were visited to determine if a nest was in the proximity.

### Landbirds

For the purposes of this study, landbirds were considered to be all birds except waterfowl, shorebirds, game birds and raptors. Throughout the study, landbirds were recorded by the habitats in which they were seen. In addition, seven belt transects were placed in representative stands of deciduous streambank (habitat type 110), silver sagebrush (habitat type 222), native grassland (habitat type 410) and CRP (habitat type 530) habitats. Characteristics of these transects are shown in [Table 2.9-3](#).

Transects varied considerably in length ([Table 2.9-3](#)), depending on the homogeneity of the habitat sampled. For example, deciduous streambank habitat (habitat type 110) was very diverse, varying from an open grass understory under a green ash canopy (i.e., savannah-like), to an understory of moderate-to-dense snowberry and other short woody plants (i.e., “bush,” defined as less

than 1 m tall), to an understory dominated by shrubs (defined as 1-5 m tall) such as chokecherry. Since these understories might be utilized by different bird species, three comparatively short transects were located to compare differences in bird use.

Similarly, there was considerable diversity in terms of vegetation height and canopy cover in tame pasture/CRP habitat (habitat type 530), depending on land use (e.g., grazing, grass hay, CRP). One transect was placed in a tall stand of smooth brome in a CRP field that was enrolled in the Private Lands Open to Sportsmen (PLOTS) program by the NDGFD.

There were few stands of silver sagebrush (habitat type 222) in the Study Area. One transect was placed in the largest of these stands.

Two transects were placed in native grassland (habitat type 410). The first transect was located adjacent to silver sagebrush and deciduous streambank habitats to demonstrate bird diversity that reflected the juxtaposition of these habitats. The second transect was placed in the largest stand of native grassland in the Study Area. It was the longest transect and covered an area from the adjoining low land to the top of the highest topographic point in the Study Area ([Figure 2.9-2](#)). Consequently it passed through two to three shortgrass prairie communities, and was long enough to document bird use of each habitat.

### Aquatic Habitats

Aquatic habitats in the Study Area were comprised of flows along the Heart River; intermittent flows and pools along the South Branch Heart River; a few naturally occurring seasonal or semi-permanent ponds; and comparatively small man-made impoundments. These sites provided habitat for amphibians, certain reptiles (e.g., turtles, garter snakes), waterfowl and shorebirds, and aquatic mammals. Many of these sites were examined at least once during the study. In addition, two ponds and 12 impoundments were selected as a representative sample of this habitat in the Study Area, and were visited several times. All wildlife species observed by sightings or evidence were recorded.

### 2.9.1.3 *Results*

#### 2.9.1.3.1 Species Lists

The lists of fish, amphibians, reptiles, birds and mammals that potentially occur in the region of the SHLM were expanded to include whether or not a species' preferred/breeding habitat occurs in the fish and wildlife resources Study Area, and whether or not the species were recorded during the baseline survey. These species lists are presented in [Appendix 2.9-2](#).

Six fish species could potentially occur in the Heart River and the South Branch Heart River in the vicinity of the Study Area. Of these, preferred habitat for four to six species is available in the Study Area; two species (33-50 percent of the total for which preferred habitat was available) were recorded during the survey ([Appendix 2.9-2](#)).

Seven amphibian species are found in the region surrounding the Study Area, and the Study Area contains preferred or breeding habitat for all seven species. Three species (43 percent of the total for which preferred habitat was available) were recorded.

Nine species of reptiles are known from the region; the Study Area contains preferred habitat for seven species. Three species (43 percent of the total for which preferred habitat was available) were recorded.

A total of 282 bird species potentially occur in the region, but preferred/breeding habitat is available in the Study Area for only 101-106 of these species. The difference is due to:

1. Many species on the potential list have been recorded in the region as migrants or winter residents, rather than breeding species;
2. The Study Area does not contain preferred/breeding habitat for many species, such as shorebirds; and
3. The methods employed during the study normally do not detect secretive species. Seventy-eight species (74 percent of the total for which preferred habitat was available) were recorded during the survey. In addition, 19 species that were considered to be migrants or winter residents were recorded, bringing the total number of bird species observed during the survey to 97.

Fifty-one species of mammals have been recorded in the region. The Study Area supports preferred habitat for 36-37 species, some of which (e.g., bats, small rodents) would not have been detected by the methods employed during the survey. Sixteen species (43 percent of the total for which preferred habitat was available) were recorded. One additional species, the black bear, was recorded by evidence and was considered to be an accidental visitor to the Study Area, bringing the total number of mammals recorded to 17 ([Appendix 2.9-2](#)).

In summary, field work documented more than 40 percent of the fish, amphibians, reptiles and mammals, and almost 75 percent of the birds expected to occur in the Study Area. Some common species, such as the tiger salamander, were probably present but were simply not observed. These percentages were considered adequate to characterize fish and wildlife resources of the Study Area.

#### 2.9.1.3.2 Habitats

Animals are normally found in areas where their needs for food and shelter are met, i.e., habitats; animal fitness, density and diversity are related to habitat features (Anderson and Gutzwiller 1994). In an environmental characterization of a proposed project, it is often desirable to know which fish and wildlife species are present in the area. Determining whether habitat exists for a given species is an initial step in this process (James and McCulloch 2002). Wildlife habitats are best identified by an integrated system based on existing vegetation, physical features and land use (Kerr 1986). Habitats are determined by many variables, including geology, topography, soils, climate, water and land use (Anderson and Gutzwiller 1994).

Classifying and inventorying fish and wildlife habitats were accomplished by a combination of field reconnaissance and interpretation of aerial photography. The descriptions of habitats include a comparison of the existing and potential value of those habitats to fish and wildlife resources as recommended by PSC.

The Study Area and vicinity are characterized by gently rolling topography. Elevations in the Study Area range from about 2,480 feet along the South Branch Heart River in the northeast corner of the Study Area to about 2,650 feet in the uplands in the southwest corner of the area. The highest point in the Study Area, a hill at about 2,710 feet, is in the northwest corner of the Study Area. The area is dissected from southwest to northeast by the South Branch Heart River, a turbid, seasonally

intermittent tributary of the Heart River. The Heart River bounds the north portion of the Study Area. The South Branch Heart River through the Study Area is characterized by a narrow incised channel and adjoining terraces that support riparian forest and shrubs.

Based on existing vegetation communities in the Study Area and vicinity, upland vegetation prior to settlement by Euro-Americans was probably dominated by shortgrass prairie, possibly with streambank terraces of silver sagebrush (*Artemisia cana*). Today, these habitats are present in comparatively small pastures used for cattle grazing. Most of the uplands in the Study Area and vicinity were historically converted to production of row crops, primarily small grains. Shallow drainages through the uplands support a mixture of herbaceous wetland stringers, sod-forming grasses and mesic shrubs.

An overview of the wildlife habitat and sightings are shown on [Figure 2.9-1](#). The distribution of wildlife habitats within the Permit Boundary, Primary and Secondary Study Areas are shown in detail on [Exhibit 2.9-1A](#), [Exhibit 2.9-1B](#), [Exhibit 2.9-1C](#), and [Exhibit 2.9-1D](#). Acreages of wildlife habitats are presented in [Table 2.9-4](#). Acreages in [Table 2.9-4](#) were derived by first calculating the acreages of habitats within the Permit Boundary. Acreages within the Permit Boundary were then added to habitat acreages from the rest of the Primary Study Area (i.e., those areas within the Primary Study Area that were not included in the Permit Boundary). The Primary Study Area acreages were then added to the acreages calculated for the Secondary Study Area (i.e., the 0.5-mile buffer) to derive the acreages for the Study Area.

Wildlife use of these habitats is presented in [Table 2.9-5](#) and is depicted on [Figure 2.9-3](#). Representative photographs of the juxtaposition of various habitats are presented in [Appendix 2.9-3](#).

Thirteen fish and wildlife habitats were identified and mapped, as discussed below and shown on [Exhibit 2.9-1A](#), [Exhibit 2.9-1B](#), [Exhibit 2.9-1C](#), and [Exhibit 2.9-1D](#).

#### 001. Rock Outcrop

Rock outcrops were typified by isolated sandstone boulders at field edges or low sandstone shelves outcropping in native grasslands. For the most part, they were too small to map; although more numerous than depicted on [Exhibit 2.9-1A](#), [Exhibit 2.9-1B](#), [Exhibit 2.9-1C](#), and [Exhibit 2.9-1D](#), they were a very small areal component of the Study Area. Nevertheless, they were used as perches by raptors and passerine birds, burrow sites for cottontails and small mammals, and were visited by

hunting red foxes and badgers. Eleven wildlife species were recorded using this habitat ([Table 2.9-5](#)). This result ([Table 2.9-4](#) and [Table 2.9-5](#)) suggests that some wildlife species utilized this habitat feature more than its apparent availability would imply. However, due to its scarcity throughout the Study Area, potential wildlife use of this habitat would not appear to be greater than its existing use.

#### 002. Pond/Impoundment/Stream

Habitat 002 comprised a very small percentage of the mapped habitat within the Study Area ([Table 2.9-4](#)). Nevertheless, 31 fish and wildlife species were recorded in aquatic habitats and along their banks; only three of the remaining 11 habitats (deciduous streambank (habitat type 110), native grassland (habitat type 410) and tame pasture/CRP (habitat type 530)) contributed more species, and all three of these habitat types accounted for much more area than water features ([Table 2.9-4](#)).

Water features were a diverse habitat component of the Study Area, and could be broadly separated into three forms (stream, pond and impoundment) based on their physical features:

- **Streams.** As discussed previously, the South Branch Heart River flows intermittently southwest-to-northeast through the Study Area, joining the Heart River about one mile downstream from the Study Area ([Figure 2.9-1](#)). The channel is sinuous, narrow (three-ten feet wide) and incised, and was too small to map ([Exhibit 2.9-1A](#), [Exhibit 2.9-1B](#), [Exhibit 2.9-1C](#), and [Exhibit 2.9-1D](#)). The South Branch Heart River originates in an area called the “Little Badlands” several miles southwest of the Study Area, and carries fine sediment from this area during periods of runoff. Through much of the Study Area, the channel bottom is fine sediment with occasional woody debris. The South Branch Heart River contributes considerable sediment into the Heart River, and eventually into Patterson Lake at Dickinson. It is not known to support a recreational fishery (Berard 2006). An attempt to qualitatively sample pools along the South Branch Heart River in June 2007 was unsuccessful because the sediment bottom was so soft and deep that it was impossible to wade with a dip net and/or spread minnow seines. However, black bullhead fry were observed in pools of the South Branch Heart River in 2006. A common snapping turtle was observed in the South Branch Heart River during the initial field reconnaissance of the Study Area in May 2006. Northern leopard frogs were common along the river banks later in summer. Beaver regularly constructed dams in forested sections of the river. Raccoon and mink tracks were observed along the river banks.

The Heart River flows east just north of the north boundary of the Study Area ([Figure 2.9-1](#)), and was also too small to map. It has limited fishery value; several years ago, the NDGFD attempted to eradicate fish in the Heart River near the town of Belfield (upstream from the Study Area) to prevent undesirable species from moving downstream into Patterson Lake near Dickinson (Berard 2006). In August, 2006 a comparatively small common carp (five to six inches long) was observed in the river below a road bridge, and northern leopard



frogs were observed at several places in summer. WESTECH wetlands delineators observed the common snapping turtle in the Heart River.

Given the flow regimes and sediment loads of the two streams (particularly the South Branch Heart River), the existing use of these water sources within the Study Area by fish and wildlife would seem to be at or near the potential use.

- Ponds. Ponds were natural (i.e., not impoundments) pools of water. Some of these were quite temporary (e.g., pools that formed in fields after rain or snow melt), some were seasonal depressions in the bottoms of drainage channels that held water after ephemeral flow in the drainage had ended (e.g., [Appendix 2.9-4.6](#) and [Appendix 2.9-4.8](#)), and others were formed by oxbows or channel variations along the South Branch Heart River. Most were too small to map. Wildlife values of these small ponds varied greatly, depending on their location, duration, and whether or not aquatic vegetation formed in them. Permanent and semi-permanent ponds were used by chorus frogs and northern leopard frogs for breeding. Plains garter snakes were observed along the banks of some ponds, and were presumably hunting young amphibians. Oxbows and side channels that supported cattails were used by ducks, and contributed one of the two sightings of yellow-headed blackbirds in the area.
- Impoundments were man-made ponds, usually located in tributary drainages to the Heart River and South Branch Heart River. Impoundments were usually larger than natural ponds and habitat conditions in and adjacent to them were influenced by factors such as water depth and livestock grazing. There were many impoundments in the Study Area ([Exhibit 2.9-1A](#), [Exhibit 2.9-1B](#), [Exhibit 2.9-1C](#), and [Exhibit 2.9-1D](#)). Twelve representative impoundments were selected within the Study Area ([Figure 2.9-2](#)), and were visited in spring and early summer 2007 to monitor wildlife use. Photos of 10 of these impoundments are presented in [Appendix 2.9-4](#). Wildlife species recorded at these sites either by direct observation or evidence on specific dates of visitation are listed in [Table 2.9-6](#).

Impoundments provided the best habitat in the Study Area for puddle ducks. For example, mallard, northern pintail and blue-winged teal broods were seen on impoundment SH-2 ([Appendix 2.9-4.2](#)). Shorebirds such as the killdeer, passerine birds such as the barn swallow and red-winged blackbird, and species such as the painted turtle, northern leopard frog, chorus frog and Woodhouse's toad were all recorded at impoundments. In addition, many species visited impoundments either for water or during foraging/hunting bouts; tracks of ring-necked pheasant, white-tailed deer, raccoon and red fox were recorded on shores, and American robins and mourning doves were observed drinking/bathing at impoundments.

As with existing wildlife use, potential wildlife use of ponds and impoundments would be influenced by factors such as the number, size and distribution of ponds and impoundments in relation to other wildlife habitats ([Exhibit 2.9-1A](#), [Exhibit 2.9-1B](#), [Exhibit 2.9-1C](#), and [Exhibit 2.9-1D](#)); the seasonal nature of at least some of the ponds and impoundments in the Study Area; the kinds and



amounts of shoreline, emergent and submerged vegetation at each pond or impoundment (see [Appendix 2.9-4](#)); and seasonal cattle use of some sites. Consequently, existing wildlife use of ponds and impoundments observed in 2006-2007 may have approached the potential for wildlife use of these sites under current conditions.

#### 021. Rural Building Site

Habitat type 021 was primarily comprised of farmsteads, although it also included sites such as a natural gas pipeline compressor station and an electrical transmission line substation. All sites contained buildings. Abandoned farmsteads where the buildings had been removed were not included. Sites mapped as habitat 021 included associated trees that could not be mapped separately as habitat type 022.

Sites were distributed throughout the Study Area ([Exhibit 2.9-1A](#), [Exhibit 2.9-1B](#), [Exhibit 2.9-1C](#), and [Exhibit 2.9-1D](#)) and varied considerably in size, but the total area of habitat type 021 was only about one percent of the entire Study Area ([Table 2.9-4](#)). Eighteen species (16 birds and two mammals) were recorded in this type ([Table 2.9-5](#)). This total was considered to be a minimum, primarily because comparatively little field time was spent in this habitat since most sites contained an occupied human residence. Consequently, existing wildlife use of this habitat was probably underestimated. Potential wildlife use would be expected to vary considerably between sites, depending on factors such as size and age of associated shelterbelts, amount of food (e.g., bird feeders, crop storage, seeds and fruits in shelterbelts, gardens) available at the sites, and tolerance of the human and domestic animal occupants for wildlife.

#### 022. Shelterbelt

Shelterbelts were defined as human-planted trees and shrubs not associated with building sites, or at abandoned sites where the buildings had been removed. Many consisted of one to two rows of trees and/or shrubs planted as windbreaks ([Appendix 2.9-3.4](#)). Although shelterbelts were a prominent habitat in visual terms, there were comparatively few of them in the Study Area and their total acreage was less than one percent of the area ([Table 2.9-4](#)).

Shelterbelts created a linear habitat profile with a high ratio of edge to depth. This ratio probably limited their value to some species of wildlife that benefited from more dense foliage such as provided by habitat type 110 (deciduous streambank). Nevertheless, 20 species (17 birds and

three mammals) were recorded in this habitat ([Table 2.9-5](#)), and shelterbelts appeared to be important habitat for ring-necked pheasant nesting and roosting.

### 023. Road/ROW/Utilities

The Primary and Secondary Study Areas were dissected by public roads and rights-of-way (ROW), as well as ROWs for electric transmission lines and a natural gas pipeline. Some of these ROWs were too small to map, but most roads and their associated ROWs could be depicted at the scale of [Exhibit 2.9-1A](#), [Exhibit 2.9-1B](#), [Exhibit 2.9-1C](#), and [Exhibit 2.9-1D](#). It was not practicable to differentiate barrow pits (which were usually vegetated) from road surfaces at this scale. Habitat type 023 accounted for about three percent of the Study Area ([Table 2.9-4](#)).

Vegetation in ROWs varied, but was usually comprised of introduced grasses such as crested wheatgrass (*Agropyron cristatum*) and smooth brome (*Bromus inermis*) ([Appendix 2.9-3.1](#)). These sites provided nesting cover for gray partridge and a variety of passerine birds. Other sites were cut in mid-to-late summer for either grass hay or grass/alfalfa hay mix ([Appendix 2.9-3.4](#)).

Twenty-seven species were recorded in road/ROW/Utilities habitat ([Table 2.9-5](#)). Most of these species were also recorded in adjoining habitats, especially native grassland (habitat type 410), crop (type 520) and tame pasture/CRP (type 530). Ring-necked pheasants, sharp-tailed grouse, gray partridge, several sparrows, bobolinks and western meadowlarks were all observed feeding in habitat type 023, and consuming waste grain or gravel on road surfaces. The only sightings of the merlin and McCown's longspur, which were considered migrants, were made in this habitat.

Given the comparatively small size of this habitat type, differences in habitat mosaic within and adjacent to this type, its narrow linear growth form, and varying land uses, the existing wildlife use and potential wildlife use of road/ROW/Utilities habitat would appear to be similar.

### 110. Deciduous Streambank

Habitat type 110 consisted of the riparian woodland along the South Branch Heart River and Heart River ([Exhibit 2.9-1A](#), [Exhibit 2.9-1B](#), [Exhibit 2.9-1C](#), and [Exhibit 2.9-1D](#)). It comprised about six percent of the area within the Permit Boundary, about four percent of the Primary Study Area, and about three percent of the Total Study Area ([Table 2.9-4](#)). As discussed in [Section 2.7.2](#) of this application, the predominant tree in these woodlands was green ash (*Fraxinus pennsylvanica*), with

lesser amounts of boxelder (*Acer negundo*). In terms of wildlife habitat, the riparian woodland system could be divided into two components based on the understory. Some stands had an open understory dominated by smooth brome, while others had a shrub understory comprised of species including snowberry (*Symphoricarpos occidentalis*), buffaloberry (*Shepherdia argentea*), chokecherry (*Prunus virginiana*) and American plum (*Prunus americana*).

Deciduous streambank habitat provided more vertical and horizontal structure than any other habitat mapped in the Study Area, and its edges adjoined many of the other wildlife habitats identified in this study ([Appendix 2.9-3.1](#), [Appendix 2.9-3.2](#) and [Appendix 2.9-3.3](#)). A total of 67 species (two amphibians, 54 birds and 11 mammals) were recorded in habitat type 110, more than any other habitat; more than 22 percent of all wildlife species recorded during this survey were observed using deciduous streambank habitat, and 19 species were not recorded in any other habitat ([Table 2.9-5](#)). Deciduous streambank habitat provided nesting substrate for the red-tailed hawk, Swainson's hawk, Cooper's hawk, ring-necked pheasant, wild turkey, great horned owl, black-billed magpie, American crow and a considerable variety of passerine birds. Although wild turkeys were recorded in several habitats, all sightings were in or adjacent to riparian woodland ([Figure 2.9-6](#)). Beaver dams were found in both the Heart River and South Branch Heart River, but dams were more frequent where the adjacent habitat was type 110, possibly because it provided dam material (sticks) and food. Fox squirrels were not recorded in any other habitat, although they may have been present in some rural building sites. Although white-tailed deer were recorded in 11 of the 13 habitats mapped in this study, sightings were more frequent in deciduous riparian habitat in all seasons ([Figure 2.9-4](#)).

Potential wildlife use of habitat type 110 appeared to be limited by human-related use of this habitat, including human residences (habitat type 021), cattle grazing of the understory, and removal of downed trees.

## 222. Silver Sagebrush

Stands of silver sagebrush were present on low terraces adjacent to the South Branch Heart River in the southwestern part of the Study Area, and often formed a mosaic with other habitats ([Exhibit 2.9-1A](#), [Exhibit 2.9-1B](#), [Exhibit 2.9-1C](#), [Exhibit 2.9-1D](#), [Appendix 2.9-3.1](#), and [Appendix 2.9-3.3](#)). Although the distribution of silver sagebrush was limited in the Study Area, it was present on similar terraces along the South Branch Heart River further upstream (southwest of

the mapped Study Area), and appeared to be more prominent towards the “Little Badlands” near the headwaters of the stream.

Fifteen wildlife species (one amphibian, 12 birds and two mammals) were recorded in habitat type 222 ([Table 2.9-5](#)). Many of these species were recorded along the edge between silver sagebrush and other habitats, and none of these species was considered to be obligates of sagebrush habitat.

Silver sagebrush stands were moderately to heavily grazed seasonally by cattle. Habitat fragmentation and grazing may limit the potential wildlife use of this habitat.

### 310. Mesic Shrub Drainage

Habitat type 310 was typically found in narrow stringers along tributary drainages to the Heart River and South Branch Heart River ([Exhibit 2.9-1A](#), [Exhibit 2.9-1B](#), [Exhibit 2.9-1C](#), and [Exhibit 2.9-1D](#)). In many cases, mesic shrubs were intermixed with other habitats, particularly deciduous streambank (habitat type 110) and riparian grass (habitat type 413) and could not be mapped separately; in these cases, it was combined with other habitats in a complex (e.g., mapping unit 310/410 on [Exhibit 2.9-1A](#), [Exhibit 2.9-1B](#), [Exhibit 2.9-1C](#), [Exhibit 2.9-1D](#), and [Appendix 2.9-3.3](#)). The predominant shrub in habitat type 310 was snowberry. Some Study Area residents called this shrub “buckbrush.” Other shrubs included chokecherry, buffaloberry and silver sagebrush.

Less than one percent of the Study Area was mapped as habitat type 310 ([Table 2.9-4](#)). Fifteen species (11 birds and four mammals) were observed in this habitat ([Table 2.9-5](#)). The only record of the red-eyed vireo came from habitat type 310, although this species is more commonly associated with woodlands. Mesic shrub drainage habitat provided nesting habitat for the mallard, northern harrier, ring-necked pheasant, mourning dove and several passerine birds. Some stands were in grazed pastures, while others were located in CRP fields and were ungrazed. Given the comparatively small size of this habitat type, differences in habitat mosaic within and adjacent to this type, its narrow linear growth form, and varying land uses, the existing wildlife use and potential wildlife use of this habitat would appear to be similar.

### 410. Native Grassland

Habitat subtype 410 was characteristically dominated by native grasses and forbs, although species composition varied considerably depending on the site, aspect and other factors ([Section 2.7.2](#)).

Small polygons of native grassland were scattered throughout the Study Area, often forming a mosaic with other habitats ([Appendix 2.9-3.1](#)). The largest stands were in the northwestern part of the Study Area ([Exhibit 2.9-1A](#), [Exhibit 2.9-1B](#), [Exhibit 2.9-1C](#), and [Exhibit 2.9-1D](#)). Most of the larger stands were included in fenced pastures and were grazed seasonally by cattle.

About 11 percent of the Study Area was mapped as habitat subtype 410, the third largest mapped habitat in the area ([Table 2.9-4](#)). A total of 42 wildlife species (two amphibians, 32 birds and eight mammals) were recorded using this habitat ([Table 2.9-5](#)), more than any habitat except type 110 (deciduous streambank). Most of the raptors (hawks, eagles, falcons and owls) recorded during the survey were observed in this habitat, including migrants/non-nesting species such as the merlin and prairie falcon ([Table 2.9-5](#)). Native grassland also accounted for the greatest diversity of sparrows recorded during the survey. Although pronghorn were observed in several habitats ([Table 2.9-5](#)), the distribution of sightings of this species was clearly associated with the larger stands of native grassland in the Study Area ([Figure 2.9-4](#)).

Potential wildlife use of native grassland habitat would be influenced by size of the habitat polygon, adjacent habitats, and use of the site (e.g., grazed vs. ungrazed). Larger, more contiguous blocks of grassland habitat would appear to have more potential wildlife use than smaller areas.

#### 413. Riparian Grass

Habitat type 413 was characterized by moist-site herbaceous vegetation in drainage bottoms ([Appendix 2.9-3.2](#)), usually associated with wetlands, streams, ponds or impoundments. Riparian grassland was often interspersed with native grassland (habitat type 410) and introduced species such as smooth brome that were usually placed into habitat type 530 (tame pasture/CRP). Consequently these types were mapped as a complex (e.g., mapping unit 410/413/530 in [Exhibit 2.9-1A](#), [Exhibit 2.9-1B](#), [Exhibit 2.9-1C](#), and [Exhibit 2.9-1D](#)).

Although riparian grassland only comprised about one percent of the mapped Study Area ([Table 2.9-4](#)) and only contributed 13 wildlife species (one reptile, nine birds and three mammals; [Table 2.9-5](#)), it was important nesting substrate for ducks (most of the duck nests found during the survey were in this habitat), ring-necked pheasants, and passerine birds such as the savannah sparrow. All observations of plains garter snakes were made in this habitat, where they were presumably hunting amphibians.

Some drainages were in pastures and were grazed by cattle; these sites had comparatively less vertical habitat structure than ungrazed sites. Given the comparatively small size of this habitat type, differences in habitat mosaic within and adjacent to this type, its narrow linear growth form, and varying land uses, the existing wildlife use and potential wildlife use of this habitat would appear to be similar.

#### 510. Alfalfa (hayed)

Alfalfa was a component in seed mixes used in some tame pastures/CRP fields (habitat type 530), and along barrow pits in habitat type 023 ([Appendix 2.9-3.4](#)). These strips and barrow pits were hayed, as were larger fields of dryland hay that could be mapped, primarily on benches along the South Branch Heart River ([Exhibit 2.9-1A](#), [Exhibit 2.9-1B](#), [Exhibit 2.9-1C](#), and [Exhibit 2.9-1D](#)).

Only about two percent of the Study Area was mapped as alfalfa ([Table 2.9-4](#)), and comparatively few wildlife species were recorded in this habitat ([Table 2.9-5](#)). The low number of species recorded in habitat type 510 was subjectively believed to be an underestimate, and was attributed to the comparatively small amount of field time spent in this habitat, and/or the distribution of these habitat polygons which made them either difficult to observe, or placed them along public roads which some species of wildlife may have avoided. Nevertheless, white-tailed deer, wild turkeys and ring-necked pheasant were seasonally observed foraging in hay fields. Both existing and potential wildlife use of alfalfa habitat would appear to be greater than documented during this survey.

#### 520. Crop

The primary land use in the Study Area was agriculture. Harvestable crops ([Table 2.9-4](#)) such as wheat and safflower were planted annually over half the Study Area. In summer 2006 some grain fields were damaged by hail, reducing their yields but increasing the amount of “waste” grain available to wildlife. Twenty-nine wildlife species were recorded in habitat type 520 ([Table 2.9-5](#)). Waterfowl (Canada geese and mallards) fed in harvested grain fields; several species of raptors, including wintering rough-legged hawks, hunted prey (white-tailed jackrabbits, thirteen-lined ground squirrels and other small mammals) in this habitat; ring-necked pheasants, gray partridge and mourning doves fed in harvested and unharvested fields; ring-billed gulls and snow buntings used this habitat during winter and/or migration; and pronghorn and white-tailed deer used crop fields for feeding and bedding. However, passerine bird species richness was low.

Given the annual cycle of seeding and harvesting crops, it seems unlikely that potential wildlife use of habitat type 520 would be substantially different from the existing use observed during this survey.

### 530. Tame Pasture/CRP

The tame pasture/CRP habitat type was comprised of fields that had been cultivated in the past but were currently seeded in predominantly introduced grass species, particularly smooth brome. It also included narrow stringers in drainages which were too small to map or were combined with other habitat types into a complex (e.g., mapping unit 410/413/530 in [Exhibit 2.9-1A](#), [Exhibit 2.9-1B](#), [Exhibit 2.9-1C](#), and [Exhibit 2.9-1D](#)). It was the second largest mapped habitat in the Study Area, after cropland (habitat type 520), suggesting that in the past an even greater percentage of the Study Area had been annually cropped. Some fields were grazed by cattle, others were hayed, and some CRP fields were not disturbed. Consequently, wildlife use of this habitat varied greatly from site to site. In total, 35 species were recorded in habitat type 530, the third highest number recorded in the habitats identified and mapped for this survey ([Table 2.9-5](#)), after habitat types 110 (deciduous streambank) and 410 (native grassland). It was subjectively believed that this total was an underestimate. For example, runways of unidentified microtine rodents were found in some CRP fields, but no specimens were observed. Similarly, many species that were recorded in habitat type 410 (native grassland) could have used tame pasture/CRP habitat.

Mallard and ring-necked pheasant nests were found in habitat type 530, and nesting by the northern harrier, gray partridge, sharp-tailed grouse, mourning dove, and several passerines could have occurred. Coyote, red fox and badger were recorded by direct observation or by evidence in this habitat. White-tailed deer were commonly observed in tame pasture/CRP, and in early June 2007 several lone does were disturbed from their bedding sites in dense stands of smooth brome in CRP fields. Their behavior suggested that fawns may have been present.

Like native grassland, potential wildlife use of tame pasture/CRP habitat would be influenced by size of the habitat polygon, adjacent habitats, and use of the site (e.g., grazing, hay or CRP).

#### 2.9.1.3.3 Fish

Black bullhead fry were observed in the South Branch Heart River and a common carp was observed in the Heart River during this study. No quantitative sampling of either stream was undertaken because NDGFD personnel indicated that the fisheries value of both streams was low (Berard 2006).

The North Dakota Parks and Recreation Department (NDPRD 2006) provided element occurrence records of fish that are considered to be of special concern within 20 miles of the Study Area. Two species were identified, the northern redbelly dace (*Phoxinus eos*) and sturgeon chub (*Macrhybopsis gelida*). Although habitat for the northern redbelly dace may be present in the Study Area ([Appendix 2.9-2](#)), all element occurrence records for both species are downstream from Patterson Lake on the Heart River, several miles downstream from the Study Area.

#### 2.9.1.3.4 Endangered or Threatened Species

The USFWS identified three federally listed endangered or threatened species (bald eagle (*Haliaeetus leucocephalus*; listed threatened), black-footed ferret (*Mustela nigripes*; listed endangered) and whooping crane (*Grus americana*; listed endangered) for Stark County, North Dakota. However, this list was last updated in December 2006, and the bald eagle was delisted in summer, 2007.

There were no sightings of endangered or threatened species during this survey. The bald eagle primarily nests along medium-to-large flowing rivers; it is not considered a resident of Stark County (NatureServe 2007a). The deciduous streambank habitat (habitat type 110) in the Study Area vicinity does not constitute nesting habitat but bald eagles could be present during migration, particularly near Patterson Lake. However, there are no element occurrence records within 20 miles of the Study Area (NDPRD 2006).

Habitat for the black-footed ferret is considered to be prairie dog colonies (USFWS 2007b). No black-footed ferret habitat is available in or near the Study Area. Interestingly, there are several historical records (1975-1980) within about 20 miles of the Study Area; the nearest is about 12 miles to the southwest (NDPRD 2006).

Whooping cranes are no longer known to nest in North Dakota. Historical nesting habitat (marshy wetlands) included the prairie pothole region of North Dakota; the Study Area does not contain



suitable nesting habitat. Nesting habitat was largely eliminated by agricultural development, although migrating whooping cranes often feed in harvested grain fields (USFWS 2007c). There are no element occurrence records of whooping crane within 20 miles of the Study Area (NDPRD 2006).

The North Dakota Parks and Recreation Department (NDPRD 2006) provided element occurrence records of wildlife species that are considered to be of concern within 20 miles of the Study Area, including the Swainson's hawk, ferruginous hawk, golden eagle, prairie falcon, long-billed curlew, burrowing owl, northern mockingbird, loggerhead shrike and yellow-breasted chat.

Preferred nesting habitat for the Swainson's hawk was available in the Study Area ([Appendix 2.9-2](#)), and nesting by this species was documented ([Table 2.9-5](#); see Section 2.9.1.3.8 below). Preferred habitat for the ferruginous hawk was not considered to be present in the Study Area ([Appendix 2.9-2](#)), and this species was not observed during the survey. Preferred nesting habitat for the golden eagle was not present in the Study Area ([Appendix 2.9-2](#)) but a single golden eagle was recorded as a migrant/winter visitor in February 2007.

Although preferred long-billed curlew habitat (dry prairie and moist meadows) was present in the Study Area, this species was not observed ([Appendix 2.9-2](#)). Long-billed curlews sometimes nest in loose colonies and may nest irregularly, moving from one site to the next year-to-year (NatureServe 2007b). Nesting was recorded in 1983 about 10 miles south of the Study Area (NDPRD 2006).

Burrowing owl preferred habitat is considered to be heavily grazed prairies, often in prairie dog colonies, although they may sometimes use ground squirrel and badger burrows for nesting. There were no prairie dog colonies in or near the Study Area. Although badger and thirteen-lined ground squirrel burrows were present, the Study Area was not considered to be preferred habitat ([Appendix 2.9-2](#)), and burrowing owls were not observed during the survey.

Northern mockingbird preferred habitat was available in the Study Area, but this species is considered to be only occasionally present in southwestern North Dakota ([Appendix 2.9-2](#)). There is a very old (1939) element occurrence record from Dickinson (NDPRD 2006). Mockingbirds were not recorded during this survey, although the related gray catbird was commonly observed ([Table 2.9-5](#)).

Preferred habitat for the loggerhead shrike includes open country woodland edges and thickets of small trees and tall shrubs ([Appendix 2.9-2](#)). Preferred habitat was available along the South Branch Heart River in the Study Area, and loggerhead shrikes were recorded commonly in and near these habitats ([Table 2.9-5](#)).

The yellow-breasted chat was included on the NDPRD list (NDPRD 2006), although there were no element occurrence records from a 20-mile radius around the Study Area. Yellow-breasted chats are considered to be fairly common in dense thickets along floodplains in southwestern North Dakota, and preferred habitat was available in the Study Area ([Appendix 2.9-2](#)). Chats were recorded during landbird surveys as well as incidentally in these habitats ([Table 2.9-5](#)).

#### 2.9.1.3.5 Big Game

Two big game species, the pronghorn and the white-tailed deer, were recorded in the Study Area ([Appendix 2.9-2](#)). A local landowner stated that mule deer were rarely observed in or near the Study Area, but were common a few miles to the west.

There were 13 recorded observations of pronghorn during the survey period. Most sightings were recorded in the northern third of the Study Area ([Figure 2.9-4](#)), and most were considered to be repeated observations of the same individuals. Pronghorn appeared to be widely distributed in the general vicinity: during the survey period pronghorn were also seen along Highway 10 about six miles east of the Study Area and about four miles west of the Study Area.

All observations were in spring and summer ([Table 2.9-7](#)), suggesting that pronghorn either left the Study Area during fall and winter, or were present irregularly in low numbers. Pronghorn were only observed in four habitat types ([Table 2.9-2](#) and [Table 2.9-4](#)). Native grassland and adjoining crop fields accounted for more than 75 percent of all group sightings, and more than 95 percent of all individuals ([Table 2.9-7](#)).

Sightings were too few and too irregular to provide accurate estimates of population size or composition. However, a comparison of various sighting records suggested that the pre-fawning population in spring 2007 was nine to fifteen pronghorn, that some individuals (males) may have left the Study Area by early summer, and that three to five fawns were recruited into the population. No mortalities were observed.

White-tailed deer were common and widespread throughout the Study Area. White-tailed deer or their evidence (tracks, droppings, hair, antler sheds, etc.) were observed in 12 of the 13 habitat types identified for this survey ([Table 2.9-5](#)), indicating their ability to use essentially all habitats available in the area. Furthermore, white-tailed deer evidence may have been a better indicator of white-tailed deer habitat use than actual sightings of deer, since sightings were influenced by factors such as:

- Time of day. Most field work occurred between dawn and dusk, so that white-tailed deer activity at night was undersampled;
- Distribution of field effort. For example, it was believed that habitat type 021 (rural building site) was underrepresented by the sighting data, primarily because little field time was spent in this habitat. However, landowners reported that white-tailed deer were commonly seen in farmyards and associated shelterbelts;
- Observability in certain habitats. White-tailed deer were difficult to see in certain habitats, including shelterbelt (habitat type 022), deciduous streambank (type 110), mesic shrub drainage (type 310) and large CRP fields (type 530).

Nevertheless, there were 37 mapped sightings totaling 65 white-tailed deer during the survey period; most sightings were within 0.25 mile of the Heart River or South Branch Heart River ([Figure 2.9-4](#)). There were comparatively fewer white-tailed deer sightings in the open habitats of the northern third of the Study Area, where pronghorn sightings were prevalent ([Figure 2.9-4](#)). However, this difference was attributed to the distance of this area from the deciduous streambank habitat along the South Branch Heart River, and the comparative scarcity of this habitat along the Heart River, rather than any displacement/competition between the two species.

White-tailed deer sightings by seasons and habitat type are given in [Table 2.9-8](#). Deer were seen in all seasons. There was no obvious indication of any white-tailed deer seasonal shift in distribution in the Study Area.

Two habitat types accounted for most sightings ([Table 2.9-7](#)): habitat type 110 (deciduous streambank) contributed 46 percent of all groups and 37 percent of all individuals observed; and habitat type 520 (crop) accounted for about 16 percent of all groups and 29 percent of all individuals. These percentages appeared to reflect the importance of deciduous streambank habitat to white-tailed deer for cover and foraging, and the prevalence of cropland (used for feeding) throughout the Study Area.

It was not possible to estimate population size or characteristics from the information collected in this study. The largest group of white-tailed deer recorded during the survey was five, and the largest total seen during a single sampling bout (i.e., assuming no duplicate counts of individuals) was 13. Fawning occurred in the Study Area; a single fawn was found in riparian grass (habitat type 413) on June 14, and several single does were disturbed from their bedding sites in tall, dense smooth brome in habitat type 530 (tame pasture/CRP) on June 13.

Two mortalities were observed. A single adult doe was found dead at the edge of a county road in September 2006. She had a broken leg, several scrapes on her side, and had bled from her mouth; these injuries suggested a deer/vehicle collision. WESTECH vegetation ecologists found a single, recently dead deer in deciduous streambank habitat along the South Branch Heart River on September 10, 2006. It was more than 0.3 mile from the nearest road, and had no apparent external injuries. No necropsy was performed, so cause of death was unverified.

#### 2.9.1.3.6 Furbearers

Beaver, coyote, red fox, mink, badger, raccoon and black bear were recorded by sightings or evidence during the baseline study.

Active beaver dams were found on both the Heart River and South Branch Heart River, but were more prevalent along the South Branch Heart River where it flowed through deciduous streambank habitat (type 110).

There was one sighting of a coyote during the survey, in eroded native grassland (habitat type 410) about 2.5 miles east of the Study Area ([Figure 2.9-5](#)). In addition, coyote tracks or scats were observed within the Study Area in habitat types 110 (deciduous streambank), 410 and 530 (tame pasture/CRP) ([Table 2.9-5](#)). Based on sightings and evidence, coyotes were considered uncommon in the Study Area, and a landowner stated that there were “few coyotes in the area now.”

There were two sightings of red fox during the survey ([Figure 2.9-5](#)), and red fox tracks or scats were observed in five habitats ([Table 2.9-5](#)). Based on these records, red fox appeared to be more common than coyote in the Study Area, but were not considered to be abundant.

Mink tracks were observed in two habitats along the banks of the South Branch Heart River ([Table 2.9-5](#)). Interestingly, muskrat (which should have been present along both the Heart River and South Branch Heart River, and were observed in Patterson Lake) were not recorded. However, since mink and muskrat are often found in the same habitat, it seems likely that muskrat may have been present in the Study Area but were simply not observed.

Badgers were seen on three occasions during the survey ([Figure 2.9-5](#)), in native grassland (habitat type 410) and silver sagebrush (type 222). In addition, badger diggings were observed in seven habitats ([Table 2.9-5](#)), suggesting that badgers were widely distributed and comparatively common in the Study Area.

A raccoon was seen crossing the county road at a bridge over the Heart River ([Figure 2.9-5](#)), and raccoon tracks or scats were observed at ponds and impoundments ([Table 2.9-6](#)), and in habitats associated with the South Branch Heart River ([Table 2.9-5](#)). Based on this evidence, raccoons were considered common in the Study Area.

WESTECH vegetation ecologists reported finding a black bear scat in deciduous streambank habitat (habitat type 110) along the South Branch Heart River in August 2006. One landowner reported that a black bear had been seen in the general vicinity, and in June 2007 another landowner said that a black bear had been killed on the highway near Dickinson in autumn 2006. The Study Area was not considered black bear habitat, and consequently this record was considered an anomaly/wanderer.

#### 2.9.1.3.7 Game Birds

Waterfowl and shore bird occurrence and habitat use in the Study Area were discussed in Section 2.9.1.3.2, and were tabulated in [Tables 2.9-2](#) and [Table 2.9-3](#).

Six other species of game birds were observed during the survey: sharp-tailed grouse, ring-necked pheasant, wild turkey, gray partridge, mourning dove and American crow.

##### Sharp-tailed Grouse

No displaying sharp-tailed grouse were heard during roadside surveys in spring 2007. No leks were found, nor were any reported by landowners. However, there were two sightings of sharp-tailed

grouse during the survey ([Figure 2.9-6](#)). The first was a single bird flying across a grain field (habitat type 520) just west of the 0.5-mile buffer in August 2007. The second was three sharp-tailed grouse flushed from a CRP field (habitat type 530) in the southern portion of the Study Area in September 2007. No broods were seen.

Virtually all sharp-tailed grouse nest within one mile of a lek, and 75 percent nest within about 0.6 mile (NatureServe 2007c). The lack of brood sightings, combined with the negative results of lek searches, suggested that no leks were present in the Study Area. Since sharp-tailed grouse home range is usually less than two square miles (Connelly et al. 1998), however, the fact that grouse were sighted in the Study Area suggested that there may be a sharp-tailed grouse lek in the general vicinity.

### Ring-necked Pheasant

Ring-necked pheasants were the most commonly observed game bird in the Study Area. They were widely distributed ([Figure 2.9-6](#)) and were recorded by sightings or evidence in 10 of the 13 habitat types mapped for this study ([Table 2.9-5](#)). For the survey period, there were 53 mapped sightings totaling 209 pheasants.

Ring-necked pheasant sightings by habitat are given in [Table 2.9-9](#). Rural building sites, shelterbelts, deciduous streambank, mesic shrub drainage and tame pasture/CRP (habitat types, 021, 022, 110, 310, and 530, respectively) combined accounted for about 76 percent of all pheasant groups, and about 82 percent all pheasants, observed during the survey.

Results from pheasant call (crow) counts are given in [Table 2.9-10](#). The count conducted on May 4 was obviously too early in the breeding season, while the count on June 3 was halted due to wind. The count on June 1 was made under overcast conditions, and it began raining steadily shortly after the count was finished. Nevertheless, the results were quite similar to those recorded on June 4, when the count was conducted under favorable conditions. On June 1 and June 4, respectively, an average of 2.2 and 2.5 calls were counted per station and an average of 1.1 and 1.3 calls were counted per minute. Approximate locations of crowing males were estimated at each stop, yielding a minimum known total of 31 displaying male pheasants in the Study Area ([Table 2.9-10](#)).

The 12 stations within the Primary and Secondary Study Areas ([Figure 2.9-2](#)) yielded a total of 35 calls, 2.9 calls per station and 1.5 calls per minute on June 1, and 38 total calls, 3.2 calls per station

and 1.6 calls per minute on June 4. It was estimated that 19 male pheasants were displaying in this area. In comparison, the 13 stations located outside the Study Area accounted for 20 total calls, 1.5 calls per station and 0.8 calls per minute on June 1, and 25 total calls, 1.9 calls per station and 1.0 calls per minute on June 4, from an estimate of 12 displaying male pheasants. The greater number of pheasants indexed in the Study Area was attributed to the juxtaposition of habitats associated with the South Branch Heart River ([Appendix 2.9-3.1](#), [Appendix 2.9-3.2](#) and [Appendix 2.9-3.3](#)).

Three ring-necked pheasant nests were found during pedestrian surveys in habitat types 310 (mesic shrub drainage), 413 (riparian grassland) and 530 (tame pasture/CRP) in the Primary Study Area in June 2007. Parts of eggshells were found in habitat types 022 (shelterbelt), 023 (road/ROW/Utilities) and 510 (alfalfa), although nesting in these habitats could not be confirmed. Brood counts in early August 2006 along roads through the Study Area yielded observations of broods of three and four chicks, and one combined brood with 12 chicks.

Remains (feathers, bones) of pheasants were observed in several habitats, but the cause of mortality could not be determined. Pheasant hunters were observed about two miles east of the Study Area in November 2006. One landowner stated that he allowed limited pheasant hunting on his property, and there were parcels of land in the Study Area enrolled in the PLOTS and Coverlocks programs; therefore hunting for pheasants and other species may have occurred in the Study Area, but was not observed.

### Wild Turkey

Wild turkeys were recorded 10 times during the survey, always along the South Branch Heart River ([Figure 2.9-6](#)). They were considered common but not abundant; for example, landowners reported that there were “some” turkeys in the Study Area. No male turkey calls were heard during roadside surveys in spring.

Of 10 sightings, eight were in habitat type 110 (deciduous streambank), one in alfalfa (habitat type 510) and one in cropland (habitat type 520). All were recorded in spring and summer. The largest group observed was five, in late March; most sightings were of single males, or males with females, in May and early June. No nests were found, and no broods were observed. Remains (feathers, bones) of two turkeys were found in deciduous streambank habitat (type 110), but the cause of mortality could not be determined.

### Gray Partridge

There were only four sightings of gray partridge during the survey, and two sightings were probably the same covey ([Figure 2.9-6](#)). Landowners reported that partridge were uncommon. Two of the four sightings were in native grassland (habitat type 410), one in crop (habitat type 520) and one in CRP (habitat type 530).

Partridge were observed in summer, fall and winter. No pairs of partridge were observed during spring 2007 roadside surveys, but nesting occurred since a brood (two adults, six chicks) was seen in August. Mortality was not observed. The largest group recorded was a covey of 18 birds, seen in September 2006. Based on the distribution of sightings ([Figure 2.9-6](#)), it was estimated that there was a minimum of three coveys in or near the Study Area.

### Mourning Dove

Mourning doves were common in the Study Area and were observed in nine of 13 mapped habitats ([Table 2.9-2](#)). Doves were so common that individual sightings were not mapped.

Mourning doves were first observed in the Study Area on May 3, 2007 but were uncommon. Therefore mourning dove coo counts were not run until June 1, 3 and 4, 2007. When compared to the habitat map ([Exhibit 2.9-1A](#), [Exhibit 2.9-1B](#), [Exhibit 2.9-1C](#), and [Exhibit 2.9-1D](#)) and station locations ([Figure 2.9-2](#)), it is evident that results ([Table 2.9-11](#)) were influenced by the presence of trees at or near a station, particularly habitat types 110 (deciduous streambank), 021 (rural building site) and 022 (shelterbelt). Such results would be expected, given that the mourning dove is considered to be a species of wooded edges ([Appendix 2.9-2](#)).

A mourning dove nest was found in habitat type 110 (deciduous streambank) in June 2007. Nesting was believed to have occurred in most habitats that supported tall shrubs or trees, since young mourning doves were observed in many habitats in August. Ground nesting was not observed. Mortalities were not observed. Mourning doves were still present in the Study Area on September 13, 2006. However, snow fell on the evening of September 15, and no doves were seen on September 16.



### American Crow

Crows were present in the Study Area from spring through autumn, but were not observed in winter. They were recorded in three habitat types containing trees (type 021, rural building site; type 022, shelterbelt; and type 110, deciduous streambank) and one habitat (crop, habitat type 520) where they foraged. They were considered to be common in the Study Area, and no individual sightings were mapped. No nests were found, but crows were present in the Study Area during nesting season. No large migratory assemblages were observed in either spring or fall.

### 2.9.1.3.8 Raptors

Eleven species of raptors (northern harrier, Cooper's hawk, Swainson's hawk, red-tailed hawk, rough-legged hawk, golden eagle, American kestrel, merlin, prairie falcon, great horned owl and short-eared owl) were recorded during the survey ([Table 2.9-5](#)). Of these, five species (rough-legged hawk, golden eagle, merlin, prairie falcon and short-eared owl) were recorded only once and were considered to be migrants. One species (northern harrier) may have nested in the Study Area but nesting was not confirmed. Nesting by five species (Cooper's hawk, Swainson's hawk, red-tailed hawk, American kestrel and great horned owl) was verified.

### Northern Harrier

Northern harriers were recorded 10 times between May 15 and September 15 ([Figure 2.9-7](#)). Of the 10 sightings, one each was in silver sagebrush (habitat type 222), native grassland (habitat type 410) and riparian grassland (habitat type 413). Four sightings were birds hunting over crop fields (habitat type 520) and three observations were birds hunting over tame pasture/CRP (habitat type 530). Both genders were observed, but never together. No birds were observed landing, and therefore no nest searches were conducted for this ground-nesting species. The most probable nesting habitat was CRP fields dominated by tall, dense stands of smooth brome.

### Cooper's Hawk

There were three sightings of Cooper's hawks during the survey. All were in deciduous streambank habitat (habitat type 110) along the South Branch Heart River ([Figure 2.9-7](#)). Two were near the southwest boundary of the Primary Study Area, and were recorded several hours apart on the same day; it was suspected that these were two sightings of the same individual.

On June 14, 2007 an active Cooper's hawk nest was found in the NW ¼ Section 27, T139N R98W ([Figure 2.9-7](#)). The nest was about 35 feet high in a decadent green ash that was estimated to be 50 feet tall. Green ash has been identified as one of the nest trees used by the Cooper's hawk, with nests averaging 31 feet above the ground (Stewart 1975).

No chicks could be seen or heard, but both adults were present and the female was observed carrying prey to the nest. Nest data compiled by Stewart (1975) suggest that eggs hatch in late May-mid June. Therefore it is possible that chicks were present in this nest.

### Swainson's Hawk

Swainson's hawks were observed in the Study Area from early May through mid-September. For the survey period there were 14 mapped sightings, including one inactive and three active nests. Most sightings were recorded within 0.5 mile of a nest site ([Figure 2.9-7](#)). Of 10 non-nest records, three were birds perched in deciduous streambank habitat (habitat type 110), six were birds hunting over crop fields (habitat type 520), and one was a bird in road/ROW/Utilities habitat (habitat type 023).

Of four nests, only one was in the Primary Study Area (near the Heart River in SE ¼ Section 9, T139N R98W; [Figure 2.9-7](#)) and could be examined closely. This nest was about 15 feet high in a green ash that was about 25 feet tall. On June 14, 2007 both adults were present and one (presumed to be the female) was on the nest.

Two active nests were observed from public roads. One (SW ¼ Section 11, T139N R98W; [Figure 2.9-7](#)) was in either a short green ash or a hawthorn along the Heart River. Two adult Swainson's hawks were building/adding to this nest on May 4, 2007 but by June 3 it appeared to have been destroyed or abandoned. It is possible that these birds moved to the nest discussed above, which was about 1.25 miles upstream, since that nest was not active in early May but was active by June 14.

The other active nest (SW ¼ Section 13, T139N R98W; [Figure 2.9-7](#)) was along the South Branch Heart River between the town of South Heart and the Study Area. It was about 15-20 feet high in a green ash that was about 35 feet tall. Two adults were present near this nest on May 4, 2007 and adults were seen nearby later in summer. In August a dead fledgling was found on the county road near this nest; it apparently had been hit by a vehicle.

An inactive nest (NW ¼ Section 14, T139N R98W; [Figure 2.9-7](#)) was observed from a vantage point on a county road above the Heart River. It was found in autumn 2006 after leaf fall, and appeared to be in a green ash. No birds were seen at this nest in subsequent field work, so this nest was not verified as a Swainson's hawk's; however, nest site characteristics (del Hoyo et al. 1994 and Stewart 1975) were typical of the Swainson's hawk.

Although individual nests were not monitored for fledgling success, it is believed that successful nesting occurred in 2006 and 2007, based on sightings of immature birds in both years. The only mortality recorded was the dead immature Swainson's hawk found in August, as discussed above.

### Red-tailed Hawk

Red-tailed hawks were the most common raptor observed during the survey. They were present in all seasons, although there was only one observation in winter, suggesting that most red-tailed hawks left the Study Area vicinity during winter. For the year, there were 19 observations, including one active and two inactive nests ([Figure 2.9-7](#)). Of the 16 non-nest sightings, 10 were birds perched in trees in deciduous streambank habitat (habitat type 110), one was a bird consuming a thirteen-lined ground squirrel in an alfalfa field (habitat type 510), one was a bird flying over habitat type 310 (mesic shrub drainage), two were birds soaring over crop fields (habitat type 520) and two were birds soaring over CRP fields (habitat type 530).

The two inactive nests were in the northwest corner of the Primary Study Area, along the Heart River in the NE ¼ Section 8, T139N R98W and the NW ¼ Section 9, T139N R98W ([Figure 2.9-7](#)). These two nests were within 0.5 mile of each other and were probably alternates in the same nest territory. WESTECH wetlands investigators saw a pair of red-tailed hawks at the Section 9 nest in May 2007, but no nesting attempt was made, possibly because Swainson's hawks had already occupied the nest about 0.5 mile downstream ([Figure 2.9-7](#)).

The active nest in the SE ¼ Section 14, T139N R98W was found in May 2007 and re-visited on June 13. The nest was about 20 feet high in a green ash that was about 25 feet tall. Two adults and one chick were observed at the nest. This chick may have fledged in late July, as an immature red-tail was seen in the company of one or more adults at two sites within one mile of the nest in August.

There were other stick nests in habitat type 110 (deciduous streambank) along the South Branch Heart River in the Study Area and some were probably constructed by red-tailed hawks. One was occupied by great horned owls (discussed below). None were occupied by red-tailed hawks, nor were hawks seen building/adding to these nests, so these nests were not assigned to any raptor species. In addition, it is likely that there were nests (active or inactive) in habitats outside the Secondary Study Area, particularly along the Heart River and South Branch Heart River.

### Rough-legged Hawk

There was one sighting of a rough-legged hawk during the survey, of a single bird perched on a fence post at the edge of a crop field (habitat type 520) north of the town of South Heart in February 2007 ([Figure 2.9-7](#)). Rough-legged hawks nest in the tundra and northern taiga forest in Canada and Alaska, and migrate south into the northern tier of the U.S. in winter, so this bird was undoubtedly a migrant/winter resident.

### Golden Eagle

There was one observation of a golden eagle during the survey, of a single juvenile bird perched in a shelterbelt (habitat type 022) in the northwest corner of Section 14, T139N R98W ([Figure 2.9-7](#)) in February 2007. In North Dakota golden eagles primarily nest in the badlands habitats in the southwestern quarter of the state, and in the Missouri River corridor (Stewart 1975). No eagles were seen in or near the Study Area during the breeding season, so it is likely that this bird was either a migrant or a dispersal from a nest located outside the area.

### American Kestrel

American kestrels were considered to be common during the breeding season in the Study Area. There were only five mapped sightings, including one active nest ([Figure 2.9-7](#)). However, other investigators in the Study Area reported seeing kestrels commonly, but did not map sighting locations. Therefore it is believed that kestrels were more common than depicted on [Figure 2.9-7](#).

The American kestrel's breeding habitat includes brushy margins of forests, mature shelterbelts, and open brushy woodlands; it also ranges over adjoining expanses of prairie and cropland (Stewart 1975). The non-nest sightings recorded during the survey reflected this habitat use, and were all of single birds hunting in habitat types 110 (deciduous streambank), 410 (native grassland),

520 (crop) and 530 (tame pasture/CRP). An active kestrel nest was located in a northern flicker hole about 15 feet high in a decadent green ash that was about 25 feet tall. Both adults were seen at the site, and one was observed entering the nest cavity.

### Merlin

Stewart (1975) reported that nesting merlins are rare, very local and irregular in occurrence in North Dakota. Preferred breeding habitat is available in the Study Area ([Appendix 2.9-2](#)), including nest sites such as abandoned black-billed magpie nests (Svingen and Martin 2004). However, this species was recorded only once, on October 11, 2006 when an individual of the subspecies *richardsonii* was observed perched on a fence post in habitat type 023 (road/ROW/Utilities) adjoining a harvested wheat field (habitat type 520), and then pursued a small flock of horned larks ([Figure 2.9-7](#)). Since merlins were not recorded in any other season, it is believed that the single record was a migrant.

### Prairie Falcon

In southwestern North Dakota, prairie falcons usually nest in indentations in clay buttes (Svingen and Martin 2004); such nesting habitat is not present in the Study Area ([Appendix 2.9-2](#)). Although prairie falcons are considered to be uncommon in southwest North Dakota, they have been recorded in Stark County (Stewart 1975). There was a single sighting in the Study Area, when WESTECH vegetation ecologists observed a prairie falcon flying over native grassland habitat on August 21, 2006 ([Figure 2.9-7](#)). Age class (adult vs. immature) was not determined, but given the comparatively late date in the nesting season, this bird could have been either a dispersing immature or a wandering adult.

### Great Horned Owl

The great horned owl was the only raptor recorded during night surveys when calling adults were heard in deciduous streambank habitat (habitat type 110) along the South Branch Heart River. There were eight mapped observations during the survey; six were along the South Branch Heart River, and included an active nest. The other two were along the Heart River ([Figure 2.9-7](#)).

The six sightings along the South Branch Heart River were all recorded within 0.5 mile of the active nest located near the center of Section 22, T139N R98W ([Figure 2.9-7](#)). All were in habitat type 110

(deciduous streambank). The nest was an inactive buteo (probably red-tailed hawk) nest placed about 30 feet high in a green ash that was about 35 feet tall. A female great horned owl was incubating eggs in the nest in mid-March 2007. One adult and one feathered chick were present at the nest on June 3, and the chick had fledged by the next site visit on June 13.

The two sightings within 0.5 mile of the Heart River were a single owl flushed from a shelterbelt (habitat type 022) in November 2006, and a single bird flushed from a green ash in June 2007.

### Short-eared Owl

There was one sighting of a short-eared owl during the survey, when a single bird was observed perched on a fence post in habitat type 023 (road/ROW/Utilities) next to a harvested grain field (habitat type 520) west of the Study Area on September 13, 2006 ([Figure 2.9-7](#)). Short-eared owls nest on the ground in native prairie, wet meadows and retired cropland ([Appendix 2.9-2](#)), and are uncommon in southwest North Dakota (Stewart 1975 and Svingen and Martin 2004). They are "...most likely to be seen flying over CRP fields" (Svingen and Martin 2004). Nesting season is mid-April to early August (Stewart 1975). Although preferred nesting habitat was available in the Study Area, the lack of sightings during nesting season suggests that the lone sighting was a dispersal.

#### 2.9.1.3.9 Landbirds

Results from landbird surveys are presented in [Table 2.9-12](#). As expected, transects 5-7 (in deciduous streambank habitat type 110) provided the greatest species richness. Although there were differences in species occurrence or numbers between the three transects, none of these differences were so pronounced that they could be attributed solely to the differences in understory between the three transects.

Only three species were identified on Transect 4. The total number of species counted may have been influenced by the comparatively short length of this transect ([Table 2.9-3](#)). However, the field biologist noted that there was a considerably greater diversity of birds at the edge between this habitat stand and its neighbors, but that there were very few birds within the transect itself. In comparison, Transect 3 contributed species that would be present on the edges with adjacent habitats.

Transects 1 (native grassland) and 2 (CRP) were identical in species richness (10 species each) and were generally similar in species occurrence, but there were differences. For example, horned larks and chestnut-collared longspurs, which prefer shortgrass native prairie or intensively grazed/hayed mixed grass prairie ([Appendix 2.9-2](#)), were not observed in CRP habitat. Conversely, the bobolink, which prefers ungrazed or lightly grazed mixed grass/tallgrass prairie or wet meadows, was not recorded in the grazed shortgrass native grassland of Transect 1. Although Transect 1 was 3.5 times longer than Transect 2 ([Table 2.9-3](#)), some species were found in abundances that were not proportional to the difference in transect length. For example, western meadowlarks were far more common on Transect 1 than on Transect 2, while Baird's sparrows (which prefer idle or lightly grazed mixed prairie and wet meadows; [Appendix 2.9-2](#)) were more common on Transect 2.

Transect 1 was deliberately placed to sample different vegetation communities that comprised habitat type 410. The field biologist noted that while western meadowlarks were found throughout the habitat type, grasshopper sparrows were primarily found in a needle-and-thread (*Stipa comata*)/threadleaf sedge (*Carex filifolia*) community on slopes at the upper elevations of the transect. Killdeer and red-winged blackbirds were observed in a damp swale (but this habitat was still type 410 rather than type 413 riparian grass), while horned larks and chestnut-collared longspurs were found primarily on heavily grazed western wheatgrass (*Agropyron smithii*)/bluegrass (*Poa* spp.) habitat on gentle slopes at lower elevations.

In summary, landbird transects demonstrated that there were differences (although sometimes slight) in species richness and numbers between habitats, which appeared to be primarily due to vegetative vertical structure and canopy cover between and among habitats.

#### 2.9.1.3.10 Other Species

Occurrences and habitat use of amphibians and reptiles in the Study Area were discussed in Section 2.9.1.3.2.

Although no methods were employed to specifically sample small and medium-sized mammals, some were noted during other aspects of the study ([Table 2.9-5](#)). White-tailed jackrabbits and eastern cottontails were considered common in their preferred habitats. Porcupines were only seen twice, but evidence (chews) suggested they were widespread in woody habitats. Evidence (tunnels, diggings) of northern pocket gophers was common in native grassland (habitat type 410) and tame pasture/CRP

(habitat type 530), but this species was expected but not recorded in several other habitats. Parts of deer mice skulls were found in two habitats, and this ubiquitous species was probably present in all habitats in the Study Area except type 002 (stream/pond/impoundment). Unidentified microtine runways were observed in habitat type 530 (tame pasture/CRP). Fox squirrels (a small game species) were common in habitat type 110 (deciduous riparian) along the South Branch Heart River. Thirteen-lined ground squirrels were considered common but not abundant in several habitats.

A hand-held electronic bat detector was used at night in August 2006 at several places along public roads. The only sites where bats were detected were near deciduous streambank habitat (habitat type 110). All calls were in the 40 MHz range, which are often (but not exclusively) *Myotis* spp. bats.

#### 2.9.1.4 Summary

A baseline survey of the fish and wildlife resources within the Study Area was conducted between August 2006 and June 2007. Fish and wildlife observations were recorded on 45 calendar days over the entire study period, with concentrations of field work in August through September 2006 and May through June 2007.

The area within the vicinity of the Study Area consists of gentle to moderately rolling topography dominated by agriculture-related land uses. Of 13 habitats identified and mapped for the baseline study, seven were the result of or strongly influenced by agricultural practices. However, the Study Area supported good fish and wildlife species richness; more than 40 percent of the fish, amphibians, reptiles and mammals, and almost 75 percent of the birds expected to occur in the Study Area, were recorded during the survey. In terms of total species richness, the most productive habitats were deciduous streambank (67 species) and native grassland (43 species). Fewer than 40 species were recorded in all other habitats. In terms of species richness versus area, the most productive habitat was water (streams, natural ponds and impoundments, including streambank vegetation); 32 species were recorded in this habitat.

Fish were a minor component of the fauna within the Study Area, and were limited to a comparatively low diversity of non-game species that were adapted to shallow, warm, turbid stream habitat provided by the South Branch Heart River and the Heart River. Similarly, comparatively few amphibians and reptiles were expected to occur in the Study Area, and most of those that were recorded were associated with aquatic habitat for at least a portion of their life cycles.



Two big game species, white-tailed deer and pronghorn, were recorded in the Study Area. White-tailed deer were year round residents and used most of the habitats in the Study Area, although deciduous streambank habitat contributed almost half of all sightings. Pronghorn were present in the Study Area at least seasonally, and their distribution and habitat use appeared to be influenced by the distribution and size of stands of native grassland.

Furbearers recorded during the study were beaver, coyote, red fox, mink, badger and raccoon. A black bear scat was found along the South Branch Heart River, and there were reports of black bear sightings in the surrounding region during the survey time frame.

Five species of upland game birds (ring-necked pheasant, wild turkey, sharp-tailed grouse, gray partridge and mourning dove) were present in the Study Area. Of these, ring-necked pheasants and mourning doves were the most abundant and widespread. Wild turkeys were present in comparatively low numbers and were usually observed in or adjacent to deciduous streambank habitat. There were no sharp-tailed grouse leks in the area, and grouse were only recorded twice during the study. Gray partridge were uncommon.

Waterfowl and shorebird species richness was limited due to the paucity of aquatic habitat. However, several species of puddle ducks nested in the Study Area, as evidenced by nests and broods.

Eleven species of raptors were recorded during the study. Of these, five species (rough-legged hawk, golden eagle, merlin, prairie falcon and short-eared owl) were recorded only once and were considered to be migrants. Nesting by northern harriers was not confirmed, while nesting by five species (Cooper's hawk, Swainson's hawk, red-tailed hawk, American kestrel and great horned owl) was verified.

A good diversity of non-game breeding birds was present in the Study Area. Landbird transects and general observations demonstrated differences in species richness and numbers between habitats, which appeared to be primarily due to vegetative vertical structure and canopy cover between and among habitats.

There were no sightings of endangered or threatened species within the Permit Boundary during the field survey; however protection of Endangered and Threatened Species within the Permit Boundary are described in Section 2.9.2.

## 2.9.2 Fish and Wildlife Protection and Enhancement Plan

### *2.9.2.1 Introduction*

This fish and wildlife resources protection and enhancement plan has been prepared in accordance with 69-05.2-09-17 NDAC. This plan describes how disturbances and adverse impacts to fish and wildlife resources from the SHLM will be minimized, and how fish and wildlife resources in the Permit Area will be enhanced, where practicable. This plan addresses the fish and wildlife species identified in Section 2.9.1, including compliance with the Endangered Species Act of 1973, as amended. This plan was also prepared in accordance with standards of protection of fish, wildlife and related environmental values listed in 69-05.2-13-08 NDAC.

### *2.9.2.2 Protection of Fish and Wildlife Resources*

Construction and operation of the SHLM will disturb fish and wildlife habitats, and the species that use them, within the Permit Area. These habitats, and their existing and potential values to fish and wildlife resources, were described in Section 2.9.1.

The following measures will be employed to protect and/or minimize disturbances and adverse impacts to fish and wildlife resources:

- In terms of total fish and wildlife species richness, the most important habitat in the Study Area is deciduous streambank habitat found along the South Branch Heart River. This habitat accounted for most raptor nests discovered during the baseline fish and wildlife study, and is a primary habitat component for white-tailed deer, wild turkey, several furbearers, and a considerable variety of birds. In accordance with 69-05.2-13-08(6)(a) NDAC and 69-05.2-13-08(6)(d) NDAC, the SHLM has been designed to minimize direct disturbance to this habitat. Direct disturbances will be reclaimed after mining as described in [Section 4.3](#).
- In terms of fish and wildlife species richness versus area, aquatic habitats (streams, natural ponds and wetlands, and impoundments) are important. In accordance with 69-05.2-13-08(6)(a) NDAC and 69-05.2-13-08(6)(f) NDAC, direct impacts to streams (i.e., the South Branch Heart River) will be minimized by reducing disturbance of the floodplain to the extent practicable, impacts to surface waters will be minimized as described in [Section 3.6](#), and impacts to wetlands will be mitigated by replacement of wetlands as described in [Section 2.10.2](#).

- As described in [Section 4.1](#), the amount of surface disturbance as a result of active mining at any given time will be minimized by congruent reclamation. Rough grading will be completed so that no more than three to four spoil piles are left ungraded in the active disturbance area. In areas where possible and economical, topsoil/subsoil will be directly respread onto the reclaimed spoil areas, minimizing the need and size of topsoil and subsoil stockpiles, and subsequent loss of vegetative productivity.
- As described in [Section 4.1](#), and in accordance with 69-05.2-13-08(6)(c) NDAC, toxic/poisonous materials will be handled according to applicable regulations to minimize the potential impact to fish and wildlife resources. Similarly, toxic debris or other materials will be removed from the disturbance area, adequately covered with nontoxic and noncombustible materials, or treated to prevent combustion. These measures will minimize impacts to fish and wildlife resources and minimize adverse effects of these materials on plant growth and approved post-mining land uses.
- In accordance with 69-05.2-13-08(2) NDAC, no surface mining activity will occur that is likely to jeopardize the continued existence of endangered or threatened species listed by the USFWS, or that is likely to result in the destruction or adverse modification of designated critical habitats of those species in violation of the Endangered Species Act of 1973, as amended. As discussed in Section 2.9.1, the USFWS has identified three listed, proposed, or candidate species for Stark County: bald eagle, black-footed ferret and whooping crane. None of these species were observed during the baseline study, and the USFWS has not designated any critical habitat for these species in Stark County. Consequently, the proposed mining plan should not affect these species. As described in Section 2.9.3, SHC will immediately report to the PSC the presence in the Permit Area of any state or federally listed endangered or threatened species of which SHC becomes aware in accordance with 69-05.2-13-08(2) NDAC.
- In accordance with 69-05.2-13-08(3) NDAC, no surface mining activity will occur in a manner that would result in the unlawful taking of a bald or golden eagle, its nest, or any of its eggs. As described in Section 2.9.1, bald eagles were not recorded in or near the proposed Permit Area during the baseline study, and there was only one sighting of a golden eagle, which was considered to be a migrant. Consequently, the proposed mining plan should not affect these species. As described in Section 2.9.3, SHC will immediately report to the PSC the persistent use of the Permit Area of any bald or golden eagle, or nesting by either species, of which SHC becomes aware in accordance with 69-05.2-13-08(3) NDAC.
- In accordance with 69-05.2-13-08(5) NDAC, if electric transmission powerlines or other transmission facilities used for or incidental to activities in the Permit Area are constructed, then design and construction will follow REA Bulletin 61-10 (Powerline Contacts by Eagles and Other Large Birds), or other guidance approved by the PSC prior to construction.

- As discussed in Section 2.9.1, pronghorn may have seasonally moved into or out of the Study area, but no migration routes for pronghorn or other wildlife species were identified during the baseline study. Therefore, in accordance with 69-05.2-13-08(6)(b) NDAC, the proposed mine will not create a barrier in known or important wildlife migration routes.
- In accordance with 69-05.2-13-08(6)(g) NDAC, pesticides will not be used in the Permit Area during mining and reclamation activities, except as specified in [Section 4.3.5](#) or otherwise approved by the PSC. As discussed in [Section 4.3.5](#), any herbicide applications to control noxious weeds will be done in coordination with and following the recommendations of appropriate weed control authorities.
- As described in [Section 4.3](#), areas revegetated to native plant species will not be fertilized. Reclaimed croplands will be fertilized, if necessary, at rates recommended by North Dakota State University Extension Publication SF-882. These measures should preclude elevated nitrogen run-off to aquatic habitats.
- In accordance with 69-05.2-13-08(6)(h) NDAC, range, forest or coal fires not approved by PSC will be prevented, controlled or suppressed. Combustible materials will be handled as described in [Section 4.1](#). As needed or appropriate for other aspects of the mining and reclamation plans, SHC will train key employees in the use of fire-fighting equipment and prevention, control or suppression of fires.
- South Heart Coal will prohibit hunting or other consumptive use of fish and wildlife resources within the Permit Area, except as warranted by site-specific conditions and approved by PSC and NDGFD. South Heart Coal will prohibit non-consumptive use of fish and wildlife resources (e.g., bird watching) within the Permit Area except for monitoring described in Section 2.9.3, or otherwise coordinated with the PSC.

### 2.9.2.3 *Reclamation and Enhancement of Fish and Wildlife Resources*

As appropriate with other aspects of the mining and reclamation plans, fish and wildlife habitats identified in Section 2.9.1 will be revegetated in accordance with 69-05.2-09-17(1)(d) and 69-05.2-13-08(6)(i-k) NDAC, as described in [Section 4.3](#). During mining, topsoil and subsoil stockpiles and other features such as runoff collection ditches and sedimentation ponds will be seeded with wildlife-compatible vegetation as described in [Sections 4.1 and 4.2](#). Wetlands will be reclaimed as described in [Section 2.10.2](#). Other enhancement features may be suggested or identified by monitoring (Section 2.9.3) and will be developed as mining and reclamation progresses, in cooperation/coordination with landowners and PSC.

### 2.9.3 Wildlife Monitoring Plan

#### *2.9.3.1 Introduction*

This fish and wildlife resource monitoring plan has been prepared in accordance with 69-05.2-09-17(1)(e) NDAC. This plan is designed to monitor the effects of surface mining on selected fish and wildlife resources. These resources have been selected based on the results of Section 2.9.1, as well as comments received by PSC and NDGFD on the SOW for the fish and wildlife resources baseline study. This monitoring plan is subject to modification after review and comment by PSC and NDGFD, and/or due to site-specific conditions that may develop as mining activities progress. The duration of monitoring will be function of reclamation success, mine life, and consultation with PSC.

#### *2.9.3.2 Habitat Conversion and Replacement*

Regularly monitoring the amounts of undisturbed, disturbed and reclaimed habitats within the Permit Area will provide a comparison with pre-mining habitat availability. Habitat availability, in turn, should suggest potential changes in fish and wildlife species richness in response to mining and reclamation. Habitat availability and composition outside the Permit Area may influence wildlife use in the Permit Area. Thus, the biennial fish and wildlife monitoring report will present the results of monitoring conducted to assess habitat availability and composition in the Permit Area and the Secondary Study Area described in Section 2.9.1.

#### *2.9.3.3 Fish and Wildlife Species Richness*

It is reasonable to assume that, due to differences in parameters including but not limited to annual climatic cycles, changes in land use in adjoining areas, vegetative species composition, structure and cover in reclaimed versus undisturbed areas, mining-related disturbance, size and availability of reclaimed habitat, etc., fish and wildlife numbers during and post-mining may not be comparable to baseline conditions described in Section 2.9.1. However, ecological function of habitat may be reflected by species richness; i.e., patterns of species richness may reflect the effects of mining and reclamation, as well as changes in land use within and adjacent to the Permit Area, during and after mining and reclamation. Therefore, during the time frame of April 1 through June 30 each year, SHC will monitor species richness in the 13 pre-mining habitats described in Section 2.9.1 as well as

reclaimed habitat. These monitoring efforts will include, but not necessarily be limited to, general observations of wildlife occurrence and use by habitat; sharp-tailed grouse lek surveys in the area examined by the baseline study; ring-necked pheasant monitoring using the stations established during the baseline study; white-tailed deer and pronghorn observations by habitat; wildlife use of undisturbed water features as well as sedimentation ponds and reclaimed impoundments and wetlands; raptor occurrence and nesting, particularly along the South Branch Heart River through the Permit Area; and landbird species richness in generally the same locations that were examined during the baseline study.

In addition, as described in Section 2.9.3, South Heart Coal will immediately report to the PSC the presence in the Permit Area of any state or federally listed endangered or threatened species of which South Heart Coal becomes aware.

Further, South Heart Coal will immediately report to the PSC the persistent use of the Permit Area of any bald or golden eagle, or nesting by either species, of which South Heart Coal becomes aware.

#### 2.9.3.4 *Monitoring Reports*

In accordance with 69-05.2-13-08(1) NDAC, by March 15 of even-numbered years South Heart Coal will submit a biennial fish and wildlife monitoring report during mining operations and until reclamation success. The monitoring report will describe the objectives of the previous two years' wildlife monitoring, the methods employed to monitor those objectives, results of monitoring, and suggestions for revisions to the monitoring plan to address changing conditions in or adjacent to the Permit Area.

**TABLES**

## **FIGURES**



## **EXHIBITS**

## **APPENDICES**

**APPENDIX 2.9-1**

**AGENCY CORRESPONDENCES**

**APPENDIX 2.9-2**

**FISH AND WILDLIFE POTENTIAL SPECIES LISTS  
SOUTH HEART LIGNITE MINE**

**APPENDIX 2.9-3**

**REPRESENTATIVE HABITAT PHOTOGRAPHS  
SOUTH HEART LIGNITE MINE**

**APPENDIX 2.9-4**

**HABITAT TYPE 002 IMPOUNDMENTS  
SURVEYED IN THE STUDY AREA**