

**Biological Assessment and Evaluation
for Wildlife Species and Sensitive
Plant Species for the Garden Creek
NGL Pipeline, McKenzie County,
North Dakota**


Prepared for

**Bear Paw Energy and
U.S. Forest Service—McKenzie Ranger District**

Prepared by

SWCA Environmental Consultants

June 20, 2011



**Biological Assessment and Evaluation for Wildlife Species and Sensitive
Plant Species Surveys for the Garden Creek NGL Pipeline,
McKenzie County, North Dakota**

Prepared for

**Bear Paw Energy, LLC
Sidney, Montana**

and

**U.S. Forest Service
McKenzie Ranger District
Dakota Prairie Grasslands
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June 20, 2011

EXECUTIVE SUMMARY

Bear Paw Energy, LLC (Bear Paw) is proposing to construct the interstate Garden Creek NGL Pipeline Project (Project) for the purpose of transferring natural gas liquids (NGL) from existing production facilities to market sales points throughout North America. The Project would consist of approximately 63.2 miles of 10-inch-diameter pipeline to transport NGL from the existing Garden Creek Gas Plant near Watford City, North Dakota, southwest to the Riverview Rail Terminal near Sidney, Montana. The alignment is proposed to cross approximately 14 miles of the Dakota National Grasslands, federal lands under the jurisdiction of the U.S. Forest Service (USFS).

Wildlife:

The proposed project would have no effect on black-footed ferret, gray wolf, greater sage-grouse, or designated critical habitat for piping plover (Table 1). Interior least tern, whooping crane, and piping plover have the potential to occur within the project area as migrants. As a result these species may be, but are not likely to be, adversely affected by the proposed project (see Table 1). Dakota skipper and Sprague’s pipit, candidate species, have suitable habitat within the project area and may be, but are not likely to be, adversely affected by the proposed project (see Table 1).

Table 1. Summary of Findings

Special Status Species Name	No Effect	Is Not Likely to Adversely Affect	Is Likely to Adversely Affect	Is Likely to Jeopardize	Is Not Likely to Jeopardize
Endangered Species					
Black-footed ferret	X				
Gray wolf	X				
Interior least tern		X			
Whooping crane		X			
Threatened Species					
Piping plover		X			
Candidate Species					
Greater sage-grouse	X				
Dakota skipper		X			
Sprague’s pipit		X			
Designated Critical Habitat					
Piping plover habitat	X				

Suitable habitat¹ for 12 sensitive animal species and four raptor species is found within the project or analysis area (Table 2). No historical prairie dog (*Cynomys* sp.) towns are within 0.5 mile of the project area. Six sharp-tailed grouse leks are known to occur within 0.5 mile of the project area. A golden eagle was observed during the field surveys, and three historical nests have been documented within the project analysis area; however these nests were not observed in 2010 or 2011 surveys. A prairie falcon was observed during field surveys and was suspected to have a nest within 0.25 mile of the project area. To minimize potential impacts to these species, conservation measures as outlined in Section 8.1 should be put into place. Therefore, the Project may impact individuals or habitat for some species, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Table 2. Determination of Impact and Occurrence of Sensitive Species, Management Indicator Species, and Raptor Species

Species Name	Determination			
	No Impact*	May Impact [†]	Will Impact [‡]	Beneficial Impact [§]
Birds (including raptors classified as sensitive species)				
American peregrine falcon	X			
Baird’s sparrow		X		
Burrowing owl	X			
Loggerhead shrike		X		
Long-billed curlew		X		
Sprague’s pipit		X		
Mammals				
Black-tailed prairie dog	X			
Bighorn sheep	X			
Fringed myotis	X			
Long-eared myotis		X		
Long-legged myotis		X		

¹ We agree with Hall et al. (1997) that habitat is organism-specific and thus not synonymous with vegetation community. However, we have refined their definition to read as follows: habitat is an area in which some members of a species regularly occur continuously or seasonally. In the field, habitat is operationally defined by the presence or absence of a species. Areas that appear suitable for a species but that have not been surveyed are considered possible habitat. We avoid using the term ‘potential’ with respect to habitat because potential is defined as ‘capable of becoming but not yet in existence;’ ‘possible,’ on the other hand, is defined as ‘of uncertain likelihood.’ We also avoid using the terms ‘unoccupied habitat’ or ‘suitable, but unoccupied habitat,’ which represent a contradiction in terms.

Species Name	Determination			
	No Impact*	May Impact [†]	Will Impact [‡]	Beneficial Impact [§]
Townsend's big-eared bat	X			
Insects				
Ottoe skipper		X		
Regal fritillary butterfly	X			
Tawny crescent butterfly		X		
Management Indicator Species				
Black-tailed prairie dog	X			
Greater sage-grouse	X			
Sharp-tailed grouse		X		
Raptors				
Bald eagle	X			
Golden eagle		X		
Ferruginous hawk		X		
Merlin		X		
Prairie falcon		X		

Note: Species that are not known to occur and have not been observed within 0.5 mile of the proposed project area are not included in this table.

* Proposed project would have no impact.

[†] Proposed project may impact individuals or habitat but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

[‡] Proposed project would impact individuals or habitat and may contribute to a trend towards federal listing or cause a loss of viability to the population or species.

[§] Proposed project would have a beneficial impact.

Sensitive Plant Species

Within the proposed alignment, habitat areas containing Hooker's Townsend daisy were documented within the projected short-term disturbance corridor although they do not intersect the alignment. For *Townsendia hookeri* a 25-foot buffer would be maintained. The proposed Project ***may impact individuals or habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.***

Suitable habitat was identified for a number of other special status or sensitive species: smooth goosefoot, maiden blue-eyed Mary, Torrey's cryptantha, nodding buckwheat, Visher's buckwheat, common starlily, dwarf mentzelia, Missouri pincushion cactus, alyssumleaf phlox, lanceleaf cottonwood, alkali sacaton, and Easter daisy. The proposed Project would result in no long-term disturbance, after restoration of pipeline and access road

disturbance. Therefore, the proposed Project **may impact habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the above-listed species.**

SWCA recommends that best management practices (USFS 2002) be implemented during construction, operation, and maintenance activities of the Project. Minimizing direct habitat disturbances would decrease any direct, indirect, and/or cumulative impacts.

A revised biological assessment and evaluation should be prepared if:

- new or additional information discloses any action that may affect threatened and endangered species and/or impact sensitive species, their habitat, or both;
- the proposed project is subsequently modified and may contribute to an effect or impact that was not considered in this assessment;
- a new species or habitat, identified by the USFS as needing additional protection, may be impacted by the proposed project; or
- the project is delayed past February 1, 2012, and is expected to be constructed during the spring raptor nesting season.

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1.0 PROPOSED ACTION

1.1 SCOPE OF WORK

Bear Paw Energy, LLC (Bear Paw) has proposed to construct the Garden Creek NGL Pipeline project (Project), which would consist of approximately 63.2 miles of 10-inch-diameter pipeline to transport natural gas liquids (NGL) from the existing Garden Creek Gas Plant near Watford City, North Dakota, southwest to the Riverview Rail Terminal near Sidney, Montana.

The proposed alignment consists of approximately 52 miles in North Dakota with the remaining 10 miles of pipeline in Montana. The North Dakota alignment is proposed to cross approximately 14 miles of lands within the jurisdiction of the U.S. Forest Service (USFS) Dakota Prairie Grasslands (DPG), Little Missouri National Grassland (LMNG). The remaining portions of the alignment in North Dakota cross fee land. In Montana, the pipeline crosses fee land and a U.S. Army Corps of Engineers jurisdictional water crossing (the Yellowstone River).

The proposed Project would parallel existing pipeline corridors where crossing federal lands. Major road crossings would be bored and cased. During construction, the Project would utilize the existing 50-foot-wide permanent right-of-way (ROW) with an additional 45-foot-wide temporary extra workspace. In total, the construction ROW is not proposed to exceed a width of 95 feet. The proposed pipeline would be buried in a single trench with a minimum of 4 feet of soil cover.

The new 10-inch pipeline would be constructed of carbon steel with external fusion bond epoxy coating. An integrity management program would be implemented for the Project, consisting of an induced current cathodic protection system to control corrosion and extend the life of the pipeline system.

SWCA Environmental Consultants (SWCA) was contracted to conduct clearance surveys for the 2011 USFS sensitive and watch list species (DPG 2011, USFS 2011a, 2011b, 2011c) on the proposed alignment and two alternative routings that were considered and eliminated. Approximately 14 miles of proposed pipeline ROWs were surveyed on USFS-administered land to determine whether the proposed action may affect any of the threatened and endangered species or impact any proposed or sensitive species, to describe and delineate population boundaries, and to document habitat conditions prior to ground-disturbing activities.

1.2 GENERAL LOCATION

This biological evaluation covers the approximately 14-mile-long survey area of the proposed pipeline construction corridor, which intercepts the following sections of USFS LMNG (5th Prime Meridian, McKenzie County, North Dakota):

- Sections 5, 6, and 7, Township (T) 147 North (N), Range (R) 103 West (W)
- Sections 7, 9, and 10, T147N, R104W

- Sections 2, 11, and 12, T147N, R105W
- Sections 23, 26, 27, 32, 33, and 34, T148N, R103W
- Sections 34 and 35, T148N, R105W

The project area is composed of approximately 60,000 feet of proposed buried pipeline and a 50-foot-wide permanent ROW with a 95-foot-wide temporary construction located on USFS-administered land (Figure 1). The anticipated project disturbance on USFS lands consists of 158.8 acres associated with the 95-foot-wide short-term disturbance corridor.

Construction is proposed to begin on September 1, 2011, and continue for approximately 60 days. Construction yards would not be placed on USFS lands. The project would utilize four existing access roads; these roads would be maintained without improvement which may include minor grading or the addition of gravel to control surface rutting. Restoration of all disturbed land would immediately follow pipeline burial. Following reclamation, no long-term disturbance would be associated with the 50-foot-wide permanent ROW.

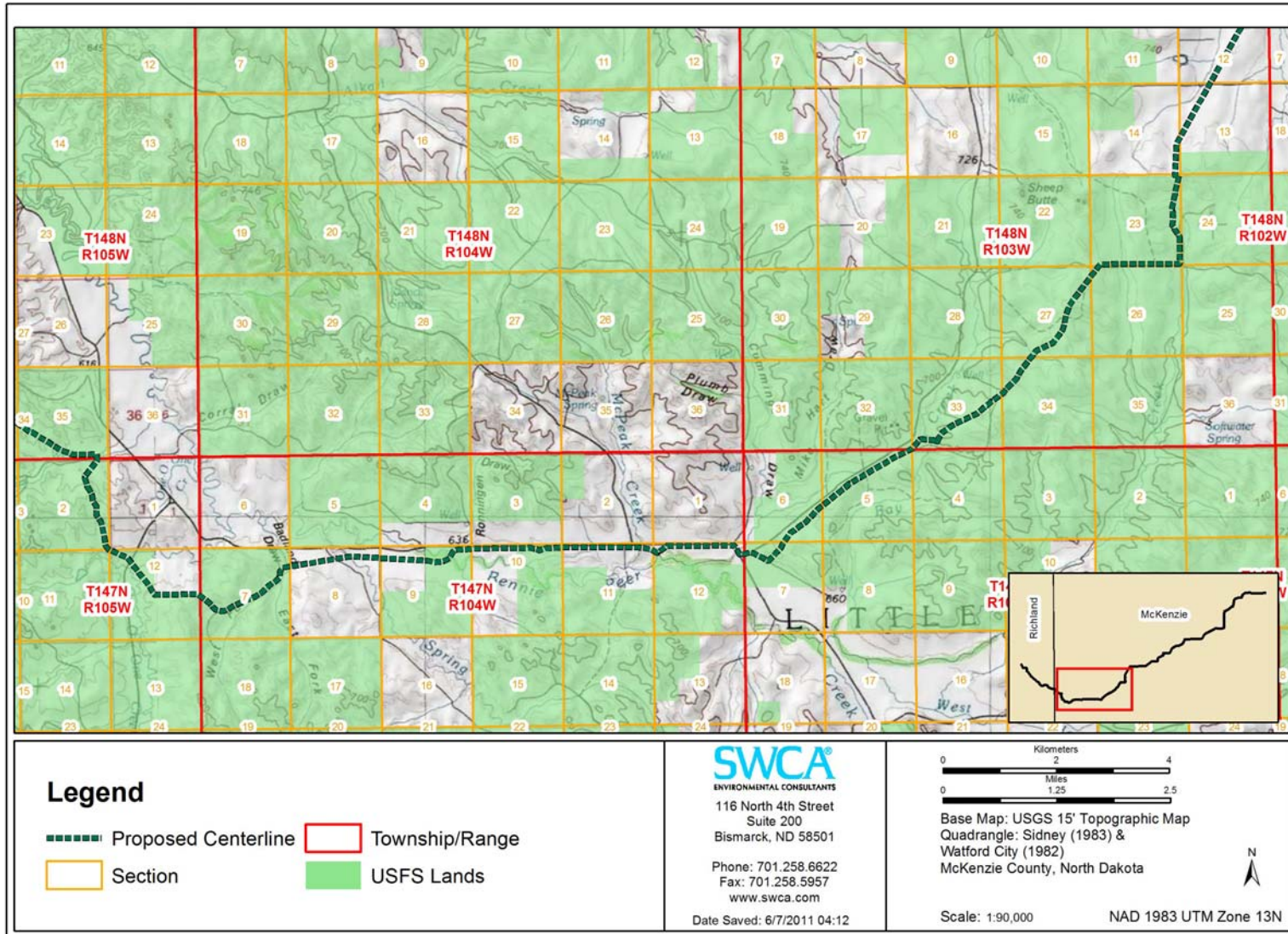


Figure 1. Project location and survey area.

2.0 STANDARDS AND GUIDELINES

2.1 LEGAL AND STATUTORY AUTHORITIES

The *Dakota Prairie Grasslands Final Environmental Impact Statement and Land Resource Management Plan* (USFS 2002) provides specific standards and guidelines for the management of national grasslands.

Proposed activities must comply with the U.S. Fish and Wildlife Service (USFWS) Endangered Species Act of 1973 and the National Forest Management Act of 1976 (USFS 2005a). These acts require federal agencies to ensure that their actions do not jeopardize the continued existence of a federally listed or proposed threatened or endangered species. Though delisted, the bald eagle (*Haliaeetus leucocephalus*) is afforded some protection under the Migratory Bird Treaty Act (916 United States Code [USC] 703–711) and the Bald and Golden Eagle Protection Act (16 USC 668–668c).

The National Environmental Policy Act (NEPA) process requires a biological evaluation to determine potential impacts to federally protected species in relation to the proposed Project (U.S. Council on Environmental Quality 1970).

2.2 DAKOTA PRAIRIE GRASSLAND MANAGEMENT AREAS

Management areas are portions of the DPG that have been categorized by management goals to maintain desired conditions. Each USFS management area has conditions, standards, and guidelines that apply for the management and use of these areas (USFS 2002). The proposed Project on USFS LMNG lands is within Management Area 6.1—Rangelands with Broad Resource Emphasis (USFS 2002).

2.2.1 Description of Management Area

This management area “is managed for diversity of native plants and animals and ecological functions and processes while providing livestock forage and a mix of other rangeland values and uses” (USFS 2002). Management areas are managed for a mosaic of livestock grazing patterns and diverse vegetation composition and structure, proper functioning condition of riparian areas, and natural-appearing landscapes. Prescribed fires are used as a management tool. Oil and gas development may occur and is visually subordinate to the landscape.

3.0 PROCEDURES

3.1 PRE-FIELD REVIEW

3.1.1 Background Data

Prior to conducting field surveys, reviewed the 2011 USFS sensitive and watch list species (DPG 2011, USFS 2011a, 2011b, 2011c) and determined appropriate survey protocols, life history, and habitat requirements for these species. SWCA also compiled background data on: known species occupying the area from the USFS (personal communication, Ingalls 2011); vegetative cover (LANDFIRE 2006); soil types (Natural Resource Conservation Service [NRCS] 2011a); hydrology (U.S. Geological Survey [USGS] 2011); and climate (North Dakota State Climate Office 2010).

3.1.2 Protected Species

The project crosses lands within the jurisdiction of the USFS DPG, LMNG in McKenzie County, North Dakota. These lands are under the jurisdiction of the USFS. North Dakota currently has five endangered, two threatened, and two candidate species listed by the Endangered Species Act (Table 1). The USFS lists 21 sensitive animal species that may be found in the DPG. North Dakota also has three management indicator species and six raptors species that are of management concern. The USFS also lists 14 sensitive plant species (Table 2) and 24 watch list plant species (Table 2) in the DPG (USFS 2011; USFWS Dakota Prairie Grasslands 2011).

Table 1. Species of Special Concern, their Habitat Use, and Distribution in the Little Missouri National Grassland

Common Name (Scientific Name)	Primary Habitat Association	County Where Species Occurs in Little Missouri National Grassland (LMNG)
Endangered		
Black-footed ferret <i>Mustela nigripes</i>	Black-tailed prairie dog (<i>Cynomys ludovicianus</i>) towns greater than 80 acres in size.	Billings, Golden Valley, McKenzie, Slope
Gray wolf <i>Canis lupus</i>	Forested areas with low densities of roads and humans.	Billings, Golden Valley, McKenzie, Slope
Whooping crane <i>Grus americana</i>	Missouri River system in extensive marshes, shallow pond areas dominated by aquatic plants.	Billings, Golden Valley, McKenzie, Slope
Interior least tern <i>Sternula antillarum</i>	Missouri River system in sparsely vegetated sandbars and sandy beaches.	McKenzie
Pallid sturgeon <i>Scaphirhynchus albus</i>	Large river system and bodies of water.	McKenzie
Threatened Species		
Piping plover <i>Charadrius melodus</i>	Missouri River system in sparsely vegetated sandbars and beaches or large alkaline wetlands. Also designated critical habitat.	McKenzie

Table 1. Species of Special Concern, their Habitat Use, and Distribution in the Little Missouri National Grassland (Continued)

Common Name (Scientific Name)	Primary Habitat Association	County Where Species Occurs in Little Missouri National Grassland (LMNG)
Candidate Species		
Greater sage-grouse* <i>Centrocercus urophasianus</i>	Expansive areas dominated by sagebrush (<i>Artemisia</i> sp.).	Billings, Slope
Sprague's pipit† <i>Anthus spragueii</i>	Extensive rolling, mixed grass prairies, ungrazed or lightly grazed with few trees.	Billings, Golden Valley, Slope, McKenzie
Dakota skipper† <i>Hesperia dacotae</i>	Lightly grazed grasslands, favoring little bluestem (<i>Schizachyrium scoparium</i>) with flowering native forbs.	McKenzie
Sensitive Species		
Birds		
American peregrine falcon <i>Falco peregrines anatum</i>	High steep cliffs or buildings.	Breeding pairs absent
Baird's sparrow <i>Ammodramus bairdii</i>	Ungrazed or lightly grazed tall and mixed-grass prairies.	Billings, Golden Valley, McKenzie, Slope
Burrowing owl <i>Athene cunicularia</i>	Abandoned mammal burrows in open areas with short vegetation, often associated with prairie dog (<i>Cynomys</i> sp.) towns.	Billings, McKenzie
Greater prairie chicken <i>Tympanuchus cupido</i>	Tall and mixed-grass prairie.	Not found in LMNG
Loggerhead shrike <i>Lanius ludovicianus</i>	Open grasslands with shrub thickets or stands of low trees.	Billings, Golden Valley, McKenzie, Slope
Long-billed curlew <i>Numenius americanus</i>	Rolling mixed-grass or short-grass prairie as well as level, fallow grounds; often near wetlands.	Billings, Golden Valley, Slope, McKenzie
Mammals		
Black-tailed prairie dog* <i>Cynomys ludovicianus</i>	Level to gently rolling dry areas, vegetation with short stature.	Billings, Golden Valley, McKenzie, Slope
Bighorn sheep <i>Ovis canadensis</i>	Open habitat with steep rocky areas for escape and safe lambing areas.	Billings, Golden Valley, McKenzie, Slope
Fringed myotis <i>Myotis thysanodes</i>	A variety of foraging habitats, with roosting habitats in caves, mine tunnels, rock crevices and old buildings.	Unknown
Long-eared myotis <i>Myotis evotis</i>	Day roosts occur in mixed coniferous and other forested areas with living or dead trees, crevices of sandstone boulders, abandoned buildings, caves, and mine shafts.	Unknown
Long-legged myotis <i>Myotis volans</i>	Day roosts and hibernacula in trees, rock crevices, fissures in stream banks, buildings.	Unknown
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	Day roosts and hibernacula in abandoned mines and buildings, caves, cliffs, and rock ledges.	Unknown
Insects		
Arogos skipper <i>Atrytone arogos</i>	Undisturbed prairies and grasslands with a variety of flowers and big bluestem.	Not found in LMNG

Table 1. Species of Special Concern, their Habitat Use, and Distribution in the Little Missouri National Grassland (Continued)

Common Name (Scientific Name)	Primary Habitat Association	County Where Species Occurs in Little Missouri National Grassland (LMNG)
Broad-winged skipper <i>Poanes viator</i>	Oxbow marshes with hairy sedge (<i>Carex lacustris</i>) and swamp milkweed (<i>Asclepias incarnate</i>).	Not found in LMNG
Dion skipper <i>Euphyes dion</i>	Lush marshes with sedges (<i>Carex</i> sp.), bulrush (<i>Typha</i>), and swamp milkweed.	Not found in LMNG
Mulberry wing <i>Poanes massasoit</i>	Woody hummock sedge meadows with tussock sedge (<i>Carex stricta</i>) and dogwood (<i>Comus</i> sp.).	Not found in LMNG
Ottoo skipper <i>Hesperia ottoe</i>	Grazed or only lightly grazed grasslands dominated by bluestem, needlegrass (<i>Nassella</i> sp.), grama grasses (<i>Bouteloua</i> sp.), and purple coneflower (<i>Echinacea purpurea</i>).	Billings, McKenzie
Poweshiek skipperling <i>Oarisma poweshiek</i>	Virgin fresh tall grass meadows with sedges and rushes (<i>Juncus</i> sp.).	Not found in LMNG
Regal fritillary butterfly <i>Speyeria idalia</i>	Native prairies that have extensive stands of violet (<i>Viola</i> sp.).	Billings, McKenzie
Tawny crescent butterfly <i>Phycoides batesii</i>	Native prairie with prevalent bluestem patches near moist, green ash (<i>Fraxinus pennsylvanica</i>) draws; prefers dogbane (<i>Apocynum</i> sp.) and woodland aster (<i>Eurybia divaricata</i>).	Billings, McKenzie, Slope
Fish		
Redbelly dace <i>Phoxinus eos</i>	Slow current areas near springs or seeps in rivers.	Billings, Slope
Management Indicator Species		
Sharp-tailed grouse <i>Tympanuchus phasianellus</i>	Very short vegetation and is generally located near the tops of rolling hills with good cover nearby.	Billings, McKenzie, Golden Valley, Slope
Raptor Species		
Bald eagle <i>Haliaeetus leucocephalus</i>	Large trees or cliffs along river banks.	Billings, Slope
Ferruginous hawk <i>Buteo regalis</i>	Shrub-steppe and mixed-grass prairie habitats and nests on buttes, cliff faces, trees, and on power transmission towers.	Billings, Slope, McKenzie
Golden eagle <i>Aquila chrysaetos</i>	Steep cliff faces or large cottonwood (<i>Populus</i> sp.) trees along intermittent creeks.	Billings, McKenzie, Golden Valley, Slope
Merlin <i>Falco columbarius</i>	Abandoned crow (<i>Corvus brachyrhynchos</i>) and magpie (<i>Pica pica</i>) nests located in green ash draws and ponderosa pine (<i>Pinus ponderosa</i>) forested areas.	Billings, McKenzie, Slope
Northern goshawk <i>Accipiter gentilis</i>	Coniferous woods.	Unknown
Prairie falcon <i>Falco mexicanus</i>	Cliff faces or badlands and towering buttes.	Billings, McKenzie, Golden Valley, Slope

* Also listed as a sensitive species and management indicator species.

† Also listed as a sensitive species.

Source: USFS (2011a, 2011b)

Table 2. USFS Region 1 Sensitive Plant Species Found on the Little Missouri National Grasslands

Genus	Species	Subspecies	North Dakota State Rank*
<i>Chenopodium</i>	<i>subglabrum</i>		S1
<i>Eriogonum</i>	<i>visheri</i>		S2, S3
<i>Collinsia</i>	<i>parviflora</i>		S2
<i>Cryptantha</i>	<i>torreyana</i>		S1
<i>Eriogonum</i>	<i>cernuum</i>		S1
<i>Escobaria</i>	<i>missouriensis</i>		SNR
<i>Leucocrinum</i>	<i>montanum</i>		S2
<i>Mentzelia</i>	<i>pumila</i>		S1
<i>Phlox</i>	<i>alyssifolia</i>		S1, S2
<i>Pinus</i>	<i>flexilis</i>		S1
<i>Populus</i>	^x <i>acuminata</i>		S2
<i>Sporobolus</i>	<i>airoides</i>		S2
<i>Townsendia</i>	<i>exscapa</i>		SNR
<i>Townsendia</i>	<i>hookeri</i>		S1

Source: USFWS (2011c)

* North Dakota State Rank:

- S1 At high risk because of extremely limited and/or rapidly declining population numbers, range, and/or habitat, making it highly vulnerable to global extinction or extirpation in the state.
- S2 At risk because of very limited and/or potentially declining population numbers, range, and/or habitat, making it vulnerable to global extinction or extirpation in the state.
- S3 Potentially at risk because of limited and/or declining numbers, range, and/or habitat, even though it may be abundant in some areas.
- SNR Not yet ranked.

Table 3. USFS Region 1 Watch List Plant Species

Family	Genus	Species	Subspecies	North Dakota State Rank*
Poaceae	<i>Agrostis</i>	<i>exarata</i>		S1
Fabaceae	<i>Astragalus</i>	<i>australis</i>		S2, S3
Fabaceae	<i>Astragalus</i>	<i>drummondii</i>		S1
Fabaceae	<i>Astragalus</i>	<i>vexilliflexus</i>		S3
Onagraceae	<i>Epilobium</i>	<i>pygmaeum</i>		S1, S2
Poaceae	<i>Bromus</i>	<i>carinatus</i>		S1
Cyperaceae	<i>Carex</i>	<i>siccata</i>		SNR
Cyperaceae	<i>Carex</i>	<i>scirpoidea</i>		S1, S2
Ranunculaceae	<i>Clematis</i>	<i>columbiana</i>	var. <i>tenuiloba</i>	S1
Asteraceae	<i>Erigeron</i>	<i>divergens</i>		S1
Asteraceae	<i>Erigeron</i>	<i>radicatus</i>		S1

Table 3. USFS Region 1 Watch List Plant Species (Continued)

Family	Genus	Species	Subspecies	North Dakota State Rank*
Liliaceae	<i>Fritillaria</i>	<i>pubida</i>		SH
Ranunculaceae	<i>Myosurus</i>	<i>apetalus</i>	var. <i>montanus</i>	S1
Onagraceae	<i>Oenothera</i>	<i>laciniata</i>		SA?
Orobanchaceae	<i>Orobanche</i>	<i>ludoviciana</i>	ssp. <i>ludoviciana</i>	S1
Fabaceae	<i>Oxytropis</i>	<i>sericea</i>		S1
Portulacaceae	<i>Phemeranthus</i>	<i>parviflorus</i>		S2
Potamogetonaceae	<i>Potamogeton</i>	<i>diversifolius</i>		S2, S3
Rosaceae	<i>Potentilla</i>	<i>diversifolia</i>		S1
Rosaceae	<i>Sibbaldiopsis</i>	<i>tridentata</i>		S1
Ranunculaceae	<i>Ranunculus</i>	<i>cardiophyllus</i>		S1
Brassicaceae	<i>Rorippa</i>	<i>calycina</i>		SH
Smilacaceae	<i>Smilax</i>	<i>ecirrhata</i>		S1, S2

* North Dakota State Rank:

- S1 At high risk because of extremely limited and/or rapidly declining population numbers, range, and/or habitat, making it highly vulnerable to global extinction or extirpation in the state.
- S2 At risk because of very limited and/or potentially declining population numbers, range, and/or habitat, making it vulnerable to global extinction or extirpation in the state.
- S3 Potentially at risk because of limited and/or declining numbers, range, and/or habitat, even though it may be abundant in some areas.
- SNR Not yet ranked.
- SH Historical, known only from records usually 40 or more years old; may be rediscovered.
- SA? Possibly excellent estimated viability/ecological integrity.

3.2 FIELD SURVEY AND SURVEY AREA

On May 17, 18, and 19, 2011, SWCA biologists Levi Binstock and Kyle McLean systematically surveyed within a 250-foot-wide survey corridor centered on the proposed pipeline, and four proposed access road corridors which are entirely within the construction ROW (Figure 1). Up to a 0.5-mile line-of-sight survey was also conducted for wildlife with the aid of binoculars and a spotting scope. Unique wildlife habitats were closely inspected on foot. An intensive search for all species of concern and an evaluation of habitat components necessary to support species of concern were conducted (USFS 2011a, 2011b, 2011c). SWCA also taxonomically identified and enumerated all trees, saplings, and shrubs within the ROW. The position of each group or single tree was geographically referenced using a handheld Trimble XT geographic positioning system (GPS) unit.

Field data were entered into a data dictionary, and points were recorded using a Trimble XT GPS unit. The GPS data were post-processed using Trimble Pathfinder software and projected into Universal Transverse Mercator (UTM), Zone 13 North, North American Datum (NAD) 1983. All GPS data were imported into ArcMap 9.3 shapefiles and plotted onto the associated geo-referenced USGS 7.5-minute quadrangle to ensure accuracy and produce location maps of all wildlife features. A digital camera was used to record nest condition and any other relevant wildlife features.

3.3 CUMULATIVE IMPACTS ANALYSIS AREA

The cumulative impacts analysis area included a 0.5-mile corridor centered on the proposed pipeline route. Within the analysis area, existing development (including roads and partially vegetated development such as buried pipelines, residential lots, and well pads) was identified using LANDFIRE land cover classification data (LANDFIRE 2006).

4.0 PROJECT DESCRIPTION

4.1 GENERAL AREA

Elevations within the project area range from approximately 1,890 to 2,400 feet above mean sea level. According to the National Hydrography Dataset, no perennial waters are within the project area (USGS 2011). The project area is in the River Breaks section of the Great Plains physiographic province in west-central North Dakota (Fenneman 1931). The River Breaks section is characterized by terraces and uplands that descend to the Missouri River (Fenneman 1931). Photographs of the project area are provided in Appendix A.

The area’s climate consists of warm summers and cold winters, with the bulk of precipitation occurring between April and October. The project area receives an average of 16 inches of precipitation per year. The average maximum temperature is between 81.5 degrees Fahrenheit (°F) and 83.5°F in July, and the average minimum temperature is between –3°F and 1°F in January (North Dakota State Climate Office 2010).

4.1.1 Vegetation

Broad-scale vegetation data were obtained from the LANDFIRE National Existing Vegetation Type layer (LANDFIRE 2006), which provides the area of developed, agricultural, and natural vegetation types, as shown in Table 4 and Figure 2. Approximately 145.57 acres, or 91.8% of the project area, is dominated by native natural vegetation types, with introduced pasture lands and agricultural cropland types accounting for the remainder. The primary vegetation communities that comprise the majority of the project area are described in Table 4 and below. Northwestern Great Plains Mixedgrass Prairie was the dominant vegetation type, making up 135.62 acres, or 85.52% of the construction corridor. Introduced perennial grasslands accounted for the second largest vegetation community with 12.65 acres (7.98%), with Western Great Plains Depressional Wetlands making up the next largest natural vegetation type with 2.91 acres, or 1.83% of the construction corridor. Detailed description of the community types is provided below.

Table 4. Broad-scale Vegetation Types Found within the Proposed Pipeline Construction Corridor

Vegetation Type	Acres Within Construction Area	Percent of Construction Impact Area
Barren	0.14	0.09
Agriculture-Cultivated Crops and Irrigated Agriculture	0.11	0.07
NASS-Close Grown Crop	0.10	0.06
NASS-Fallow/Idle Cropland	0.00	0.00
NASS-Row Crop-Close Grown Crop	0.01	0.01
Introduced Upland Vegetation-Perennial Grassland and Forbland	12.65	7.98
Northwestern Great Plains Mixedgrass Prairie	135.62	85.52
Inter-Mountain Basins Big Sagebrush Steppe	0.12	0.08

Table 4. Broad-scale Vegetation Types Found within the Proposed Pipeline Construction Corridor (Continued)

Vegetation Type	Acres Within Construction Area	Percent of Construction Impact Area
Northwestern Great Plains Shrubland	1.36	0.86
Herbaceous Semi-wet	2.13	1.34
Western Great Plains Depressional Wetland Systems	2.91	1.83
Western Great Plains Floodplain Systems	0.30	0.19
Western Great Plains Sand Prairie	1.58	1.00
Western Great Plains Sparsely Vegetated Systems	0.62	0.39
Western Great Plains Wooded Draw and Ravine	0.91	0.58
Total	158.56	100.00%

Source: LANDFIRE (2006)

The largest vegetation community within the construction corridor is Northwestern Great Plains Mixedgrass Prairie, accounting for 85.52% of the landcover. Species common to the Northwestern Great Plains Mixedgrass Prairie are western wheatgrass (*Pascopyrum smithii*), green needlegrass (*Nassella viridula*), needle and thread (*Hesperostipa comata*), prairie junegrass (*Koeleria macrantha*), and various fescue (*Festuca* spp.) species. Shrub species found in this vegetation type include various snowberry (*Symphoricarpos* spp.) species, prairie sagewort (*Artemisia frigida*), silver sagebrush (*A. cana*), Wyoming big sagebrush (*A. tridentata* ssp. *wyomingensis*), soapweed yucca (*Yucca glauca*), and plains prickly pear cactus (*Opuntia polyacantha*) (Montana Field Guide 2011; Natureserve 2011).

The Northwestern Great Plains Shrubland accounted for 0.86% of the landcover within the construction corridor. Dominant shrub species include Saskatoon serviceberry (*Amelanchier alnifolia*), skunkbush sumac (*Rhus trilobata*), snowberry, silver buffaloberry (*Shepherdia argentea*), black hawthorn (*Crataegus douglasii*), silverberry (*Elaeagnus commutate*), shrubby cinquefoil (*Dasiphora fruticosa* ssp. *floribunda*), and dwarf-shrubs such as creeping juniper (*Juniperus horizontalis*). Common grass species include fescue, prairie junegrass, and bluebunch wheatgrass (*Pseudoroegneria spicata*) (Montana Field Guide 2011; Natureserve 2011).

Western Great Plains Sand Prairie and Western Great Plains Sparsely Vegetated systems accounted for approximately 1.0% and 0.39% of the landcover, respectively. These systems consist of porous and coarse-textured soils with dominant grasses which are well-adapted to this condition and stand size corresponds to the area of exposed caprock sandstone or patches where former caprock formations have eroded (Natureserve 2011; Montana Field Guide 2011). Needle and thread is the dominant grass species. Other frequent species include little bluestem, often occurring with threadleaf sedge (*Carex filifolia*) and dominating both sandy sites and actively eroding sites. Prairie sandreed (*Calamovilfa longifolia*), sand bluestem (*Andropogon hallii*) and big bluestem (*Andropogon gerardii*) are sporadically distributed and found generally on the coarsest-textured sands. Sparsely vegetated areas identified in the LANDFIRE data is likely a subset of sand prairie.

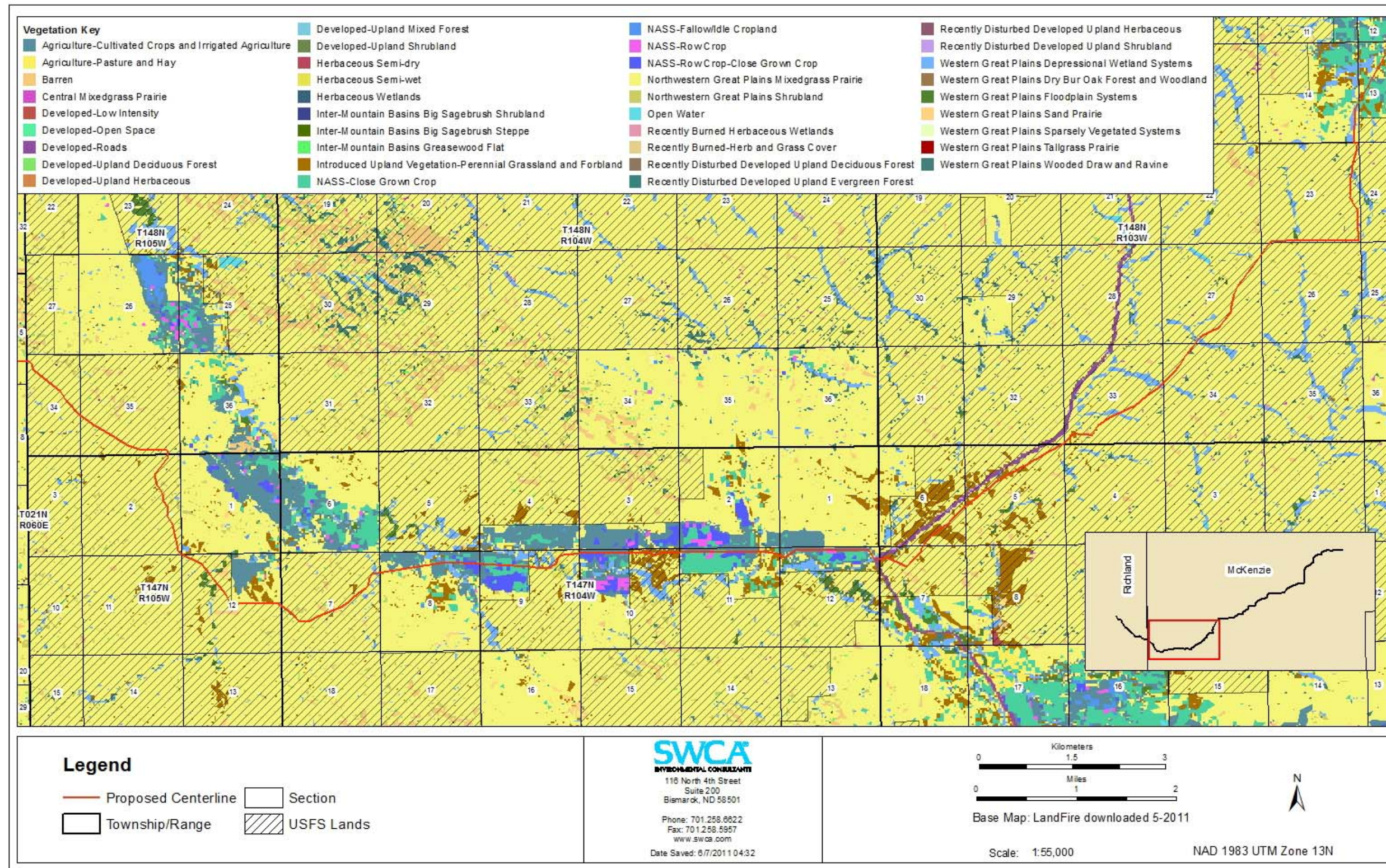


Figure 2. Broad-scale vegetative cover types near the project area (LANDFIRE 2006).

Inter-mountain Basins Big Sagebrush Shrubland accounted for less than 1% of the vegetative cover. This community is dominated by species of big sagebrush (*Artemisia tridentata*). Big Sagebrush Shrublands are characterized by herbaceous cover usually less than 25% dominated by Wyoming big sagebrush and, to a lesser extent, basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*). Other shrubs may be present such as Rocky Mountain juniper (*Juniperus scopulorum*), saltbush (*Atriplex* sp.), greasewood (*Sarcobatus vermiculatus*), rubber rabbitbrush (*Ericameria nauseosa*) or green rabbitbrush (*Chrysothamnus viscidiflorus*) (Montana Field Guide 2011; Natureserve 2011).

The Western Great Plains Wooded Draw and Ravine vegetation type accounted for approximately 0.58% of the vegetative cover within the construction area. This woody vegetation was identified in 25 separate patches during the field survey. This vegetation type is dominated by green ash, American elm (*Ulmus americana*), boxelder (*Acer negundo*), chokecherry (*Prunus virginiana*), western snowberry (*Symphoricarpos occidentalis*), Sprengel's sedge (*Carex sprengei*), and western poison ivy (*Toxicodendron rydbergii*) (Natureserve 2011; Montana Field Guide 2011). For a photograph of the woody draws community type, see Figures A.3 and A.4 in Appendix A.

Western Great Plains Depressional Wetlands occur in lowland depressions and along lake borders with open basins. They are characterized by saturated soils resulting from a permanent water source through most of the year. Species diversity can be high in some occurrences. These wetlands usually contain emergent graminoids such as cattails (*Typha* spp.), sedges (*Carex* spp.), spikerushes (*Eleocharis* spp.), rushes (*Juncus* spp.) and bulrushes (*Schoenoplectus* spp.), as well as floating vegetation such as pondweeds (*Potamogeton* spp.), arrowhead (*Sagittaria* spp.), or common hornwort (*Ceratophyllum demersum*). In semi-permanent systems, the drawdown zone is typically dominated by beaked sedge (*Carex utriculata*) water sedge (*C. aquatilis*), and Nebraska sedge (*C. nebrascensis*). In seasonal ponds that draw down annually, and in semipermanent wetlands during drought years, buried seeds of both annuals and perennials will germinate in exposed mud flats (Montana Field Guide 2011; Natureserve 2011).

Western Great Plains Floodplain Systems occur along the lower terraces and floodplains of tributaries of the Missouri River, usually as narrow bands of streamside vegetation. Dominant species include cottonwood (*Populus deltoids*) and willow (*Salix* spp.), with honeysuckle (*Lonicera* spp.) and other woody vines. Grass cover underneath the trees is an important part of this system and is a mix of tallgrass species, including switchgrass (*Panicum virgatum*) and big bluestem (Montana Field Guide 2011; Natureserve 2011).

4.1.2 Broad-scale Soils

Twenty-six soil types are present in the project construction corridor, based on NRCS mapping (NRCS 2011a). The area analyzed for soils covers the 95-foot-wide corridor. Table 5 lists all soil types units within the project area. The three most frequently occurring soil types were the Cherry-Cabba silt loam, which was present in 11.30% of the corridor, Cabba-Chama-Sen silt loams, present in 10.11% of the corridor, and the Rhoades-Daglum complex soils, covering 7.29% of the corridor. The individual soil series descriptions for these more prevalent soil types are provided here.

Cabba

The Cabba series consists of shallow, well drained, moderately permeable soils found on hills, escarpments, and sedimentary plains. The soil slopes broadly range between 2% and 70%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 16 inches and mean annual air temperature is approximately 43°F. The most common vegetation species found on this soil type are little bluestem, green needlegrass (*Nasella viridula*), and other various herbs, forbs, and shrub species (NRCS 2011a).

Chama

The Chama soil series consists of well drained soils found in materials weathered from soft siltstone, mudstone and shale on uplands. These soils are reasonably deep to soft siltstone, mudstone or shale. These soils are moderately or moderately slowly permeable. The slope ranges from 0 to 45%. Mean annual air temperature is 42°F, and mean annual precipitation is 15 inches. Soils are cropped to small grains, which are mostly wheat, where a significant acreage is in rangeland. The native vegetation is principally western wheatgrass, needle and thread, and blue grama (*Bouteloua gracilis*) (NRCS 2011a).

Cherry

The Cherry series consists of very deep, well drained, moderately slowly or slowly permeable soils that formed in alluvium on fans, foot slopes, dissected uplands and terraces. Slopes range from 0 to 25%. Mean annual air temperature is 42°F, and mean annual precipitation is 14 inches. Soils are cropped to small grains, hay, and pasture and are used for grazing. Native vegetation is western wheatgrass, blue grama, green needlegrass, needle and thread, and a variety of forbs and shrubs (NRCS 2011a).

Daglum

The Daglum series consists of deep and very deep, moderately well and well drained, slow to very slowly permeable soils found on swales on upland terraces and foot slopes. Slopes range from approximately 0 to 9%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 16 inches and mean annual air temperature is approximately 42°F. This soil type is used for rangeland foraging and cultivation of small grains. Native vegetation species common to this soil type include: western wheatgrass, blue grama, and green needlegrass (NRCS 2011a).

Rhoades

The Rhoades series consists of deep and very deep, well to moderately well drained, very slowly permeable soils found on swales and uplands with slopes ranging from approximately 0 to 25%. The mean annual precipitation found throughout the spatial extent of this soil type is approximately 16 inches and mean annual air temperature is approximately 42°F. This soil type is largely used for rangeland foraging. Native vegetation species common to this soil type include: western wheatgrass and blue grama (NRCS 2011a).

Sen

The Sen series consists of well drained, moderately permeable soils that formed in calcareous siltstone or shale. They are moderately deep to soft bedrock. These soils are on upland plains and have slope of 0 to 25%. Mean annual air temperature is 42°F, and mean annual precipitation is 15 inches. Soils are cropped to small grains in a crop–summer fallow rotation. Native vegetation is mid- and short prairie grasses such as green needlegrass, needle and thread, western wheatgrass, blue grama, and a variety of forbs (NRCS 2011a).

Table 5. Summary of Soils within the Project Area

Soil Types	Acres within Construction ROW	Slope (percent)	Percent of Project Area
Badland, outcrop-Cabba complex,	4.04	9 to 70	2.56
Beisigl-Flasher loamy fine sands	1.26	6 to 15	0.80
Beisigl-Flasher-Tally complex	3.36	9 to 50	2.13
Belfield-Grail silty clay loams	3.86	0 to 2	2.47
Belfield-Savage silty clay loams	4.96	2 to 6	3.15
Brandenburg-Cabba-Badland, outcrop complex	4.86	9 to 70	3.08
Brandenburg-Cabba-Dogtooth complex	11.01	15 to 70	6.98
Brandenburg-Searing-Dogtooth complex	1.91	6 to 15	1.21
Cabba-Badland, outcrop complex	5.37	9 to 70	3.41
Cabba-Chama-Sen silt loams	15.94	9 to 15	10.11
Cabba-Sen-Chama silt loams	4.05	15 to 70	2.57
Chama-Cabba-Sen silt loams	0.08	6 to 9	0.05
Cherry silt loam	6.92	0 to 6	4.39
Cherry-Cabba silt loams	17.81	9 to 40	11.30
Daglum-Belfield complex	8.57	0 to 6	5.44
Dogtooth-Janesburg silt loams	1.21	0 to 6	0.77
Dogtooth-Janesburg-Cabba complex	15.16	6 to 30	9.61
Korchea loam, channeled	1.59	0 to 2	1.01
Korchea loam, channeled, wooded	3.47	0 to 2	2.20
Maschetah silt loam	6.11	0 to 2	3.88
Maschetah silt loam	10.50	2 to 6	6.66
Maschetah silt loam	3.73	6 to 9	2.37
Rhoades-Daglum complex	11.50	0 to 6	7.29
Savage silty clay loam	2.90	0 to 2	1.84
Vebar-Flasher-Tally complex	4.69	9 to 15	2.97
Zahl-Williams-Cabba complex	2.79	6 to 9	1.77

Source: NRCS (2011a)

4.1.3 Project Area Scale Conditions

During field surveys, wildlife observations, vegetation community type and composition, and hydrology observations were recorded. Wildlife observed in the proposed and alternative routes are displayed in Table 6. A stock pond and two intermittent stream crossing were observed within the survey corridor. General habitat type within the proposed route consisted of mixed grass prairie with sparse shrub land. Forested drainages were present within the survey corridor. General habitat type within the alternate routes consisted of mixed grass prairie with moderate amounts of forested upland areas abutting the surveyed right of way. For examples of habitat within the project area, see Appendix A.

Table 6. Wildlife Observed during Field Surveys at the Proposed Pipeline Route

Common Name	Scientific Name	Observation Type	Comments
Northern harrier	<i>Circus cyaneus</i>	Primary	
Swainson's hawk	<i>Buteo swainsoni</i>	Secondary	Nest observed
Lazuli buntings	<i>Passerina amoena</i>	Primary	Two individuals observed
Yellow warblers	<i>Dendroica petechia</i>	Primary	Four individuals observed
Pronghorn	<i>Antilocapra americana</i>	Primary	
Sprague's pipit	<i>Anthus spragueii</i>	Primary	
Prairie falcon	<i>Falco mexicanus</i>	Primary	Possible nest in area
Golden eagle	<i>Aquila chrysaetos</i>	Primary	

5.0 ASSESSMENT PROCESS

5.1 FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES

Assessments for federally listed species were conducted by evaluating historical and present occurrences and determining if suitable habitat exists within the project area. A determination was made concerning direct and cumulative effects of the proposed activities on each species. Determinations made for federally listed species are:

- no effect;
- is not likely to adversely affect;
- is likely to adversely affect;
- is likely to jeopardize a proposed species or adversely modify critical habitat; or
- is not likely to jeopardize a proposed species or adversely modify critical habitat.

Potential impacts and avoidance and mitigation practices are provided under the species discussion unless a “no effect” determination is made. If there are no impacts now, or in the future, no avoidance or mitigation practices are necessary.

5.2 FEDERALLY LISTED SENSITIVE SPECIES AND MANAGEMENT INDICATOR SPECIES

Evaluation for sensitive species and management indicator species was conducted based on historical and present occurrences and by determining if suitable habitat exists within the analysis area. Based on these factors, a determination was made concerning the direct and cumulative effects of the proposed activities on each species. If there was potential for the species to occur within the LMNG, a determination was made that the proposed Project:

- will have no impact;
- may impact individuals or habitat but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species;
- will impact individuals or habitat and may contribute to a trend towards federal listing or cause a loss of viability to the population or species; or
- will have a beneficial impact.

Potential impacts and avoidance and mitigation practices are provided under the species discussion unless a “no impact” determination is made. If there are no impacts now, or in the future, no avoidance or mitigation practices are necessary.

5.3 RAPTOR SPECIES

Evaluations for raptors were conducted based on historical and present occurrences of nests and by determining if suitable nesting habitat exists in the analysis area. Determinations made follow the same procedures used for sensitive species.

Potential impacts and avoidance and mitigation practices for raptors are based on timing and type of proposed disturbance. In North Dakota, breeding and nest initiation begins in February, and nesting lasts through late July or August, depending on the species. Since raptors are migratory and return to their nesting areas and/or nests, SWCA recommends a spring survey for all raptor species of concern if the project is delayed past February 1 and expected to take place during the next nesting season. Any special avoidance and mitigation practices are provided under the species discussion.

5.4 EXCLUDED SPECIES

Species were excluded from further evaluation and discussion if their habitat requirements and known range are not found in the project area and if no confirmed sightings of the species have been made in western North Dakota or the near vicinity (see Table 1).

6.0 ASSESSMENT OF WILDLIFE SPECIES

6.1 ENDANGERED SPECIES

6.1.1 Black-footed Ferret

Black-footed ferrets are nocturnal, solitary carnivores of the weasel family that have been largely extirpated from the wild primarily as a result of range-wide decimation of the prairie dog (*Cynomys* sp.) ecosystem (Kotliar et al. 1999). They have been listed by the USFWS as endangered since 1967, and have been the object of extensive re-introduction programs (USFWS 2010c). Ferrets inhabit extensive prairie dog complexes of the Great Plains, typically composed of several smaller colonies in proximity to one another that provide a sustainable prey base. The *Black-footed Ferret Survey Guidelines for Compliance with the Endangered Species Act* (USFWS 1989) states that ferrets require black-tailed prairie dog (*Cynomys ludovicianus*) towns or complexes greater than 80 acres in size, and towns of this dimension may be important for ferret recovery efforts (USFWS 1988a). Prairie dog towns of this size are not found in the project area. The proposed project would have *no effect* on this species at this time.

6.1.2 Gray Wolf

The gray wolf, listed as endangered in the United States in 1978, was believed extirpated from North Dakota in the 1920s and 1930s with only sporadic reports from the 1930s to present (Licht and Huffman 1996). The presence of wolves in most of North Dakota consists of occasional dispersing animals from Minnesota and Manitoba (Licht and Fritts 1994; Licht and Huffman 1996). Most documented gray wolf sightings that have occurred within North Dakota are believed to be young males seeking to establish territory (Hagen et al. 2005). The Turtle Mountains region in north-central North Dakota provides marginal habitat that may be able to support a very small population of wolves. The closest known pack of wolves is the Minnesota population located approximately 28 kilometers (km) from the northeast corner of North Dakota.

The gray wolf uses a variety of habitats that support a large prey base, including montane and low-elevation forests, grasslands, and desert scrub (USFWS 2010d). Due to a lack of forested habitat and distance from Minnesota and Manitoba populations, as well as the troubled relationship between humans and wolves and their vulnerability to being shot in open habitats (Licht and Huffman 1996), the re-establishment of gray wolf populations in North Dakota is unlikely. Additionally, habitat fragmentation, in particular road construction as a result of oil and gas development, may further act as a barrier against wolf recolonization in western North Dakota. The proposed project will have *no effect* on this species at this time.

6.1.3 Interior Least Tern

The interior population of the least tern is listed as endangered by the USFWS (1985b). This bird is the smallest member of the gull and tern family, measuring approximately 9 inches in length. Terns remain near flowing water, where they feed by hovering over and diving into standing or flowing water to catch small fish (USFWS 2010g).

The interior population of least terns breeds in isolated areas along the Missouri, Mississippi, Ohio, Red, and Rio Grande river systems, where they nest in small colonies. From late April to August, terns nest in a shallow hole scraped in an open sandy area, gravel patch, or exposed flat and bare sandbars along rivers, sand and gravel pits, or lake and reservoir shorelines. The adults continue to care for chicks after they hatch. Least terns in North Dakota will often be found sharing sandbars with the piping plover, a threatened species (USFWS 2010g).

Census data indicate over 8,000 least terns in the interior population. In North Dakota, the least tern is found mainly on the Missouri River from Garrison Dam south to Lake Oahe, and on the Missouri and Yellowstone rivers upstream of Lake Sakakawea (USFWS 1990, 2010g). Approximately 100 pairs breed in North Dakota (USFWS 2010g). Details of their migration are not known, but their winter range is reported to include the Gulf of Mexico and Caribbean Islands (USFWS 1990, 2010g).

Loss of suitable breeding and nesting habitat for terns has resulted from dam construction and river channelization on major rivers throughout the Mississippi, Missouri, and Rio Grande River systems. River and reservoir changes have led to reduced sandbar formation and other shoreline habitats for breeding, resulting in population declines. In addition, other human shoreline disturbances affect the species (USFWS 1990). Critical habitat has not been designated for the species (USFWS 2010g).

Suitable shoreline habitats for breeding and nesting terns does not occur in the project area. It is unlikely that terns would visit the upland habitats present in the project area. Therefore, the proposed Project *may affect, but is not likely to adversely affect* endangered least terns.

6.1.4 Whooping Crane

The whooping crane was listed as endangered in 1970 in the United States by the USFWS, and in 1978 in Canada. Historically, population declines were caused by shooting and destruction of nesting habitat in the prairies from agricultural development. Current threats to the species include habitat destruction, especially suitable wetland habitats that support breeding and nesting, as well as feeding and roosting during their fall and spring migration (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007).

The July 2010 total wild population was estimated at 383 (USFWS 2010e). There is only one self-sustaining wild population, the Aransas-Wood Buffalo National Park population, which nests in Wood Buffalo National Park and adjacent areas in Canada, where approximately 83% of the wild nesting sites are found (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007; USFWS 2010e). Dunn County, including the project area, is within the primary migratory flyway of whooping cranes.

Whooping cranes probe the soil subsurface with their bills for foods on the soil or vegetation substrate (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007). Whooping cranes are omnivores and foods typically include agricultural grains, as well as insects, frogs, rodents, small birds, minnows, berries, and plant tubers. The largest amount of time during migration is spent feeding in harvested grain fields (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007). Studies indicate that whooping cranes use a variety of habitats during migration, in addition to cultivated croplands, and generally roost in small palustrine

(marshy) wetlands within 1 km of suitable feeding areas (Howe 1987, 1989). Whooping cranes have been recorded in riverine habitats during their migration, with eight sightings along the Missouri River in North Dakota (Canadian Wildlife Service and U.S. Fish and Wildlife Service 2007:18). In these cases, they roost on submerged sandbars in wide, unobstructed channels that are isolated from human disturbance (Armbruster 1990).

Suitable whooping crane foraging habitat (i.e., cultivated cropland) was not observed near the Project area. Additionally, project precautionary measures would be implemented if a whooping crane is sighted in or near the project area. Bear Paw would suspend all heavy equipment operation activities and notify the USFWS and USFS of the sighting, should a whooping crane be spotted within 0.5 mile of the project area. As a result, the proposed Project *may affect, but is not likely to adversely affect* the endangered whooping crane.

6.2 THREATENED SPECIES/CRITICAL HABITAT

6.2.1 Piping Plover

The piping plover is a small shorebird which breeds only in three geographic regions of North America: the Atlantic Coast, the Northern Great Plains, and the Great Lakes. Piping plover populations were federally listed as threatened and endangered in 1985, with the Northern Great Plains and Atlantic Coast populations listed as threatened, and the Great Lakes population listed as endangered (USFWS 1985a).

Plovers in the Great Plains make their nests on open, sparsely vegetated sand or gravel beaches adjacent to alkali wetlands, and on beaches, sand bars, and dredged material islands of major river systems (USFWS 2002, 2010f). The shorelines of lakes of the Missouri River constitute significant nesting areas for the bird. Piping plovers nest on the ground, making shallow scrapes in the sand, which they line with small pebbles or rocks (USFWS 1988b). Anthropogenic alterations of the landscape along rivers and lakes where piping plover nest have increased the number and type of predators, subsequently decreasing nest success and chick survival (USFWS 2002, 2010f). The birds fly south by mid to late August to areas along the Texas coast and Mexico (USFWS 2002). The Northern Great Plains population has continued to decline despite federal listing, with population estimates of 1,500 breeding pairs in 1985 reduced to fewer than 1,100 in 1990. Low survival of adult birds has been identified as a factor (Root et al. 1992). Current conservation strategies include identification and preservation of known nesting sites, public education, and limiting or preventing shoreline disturbances near nests and hatched chicks (USFWS 1988b, 2010f).

Suitable shoreline habitats for breeding and nesting plovers does not occur in the project area. It is unlikely that migrating plovers would visit the project area during their migration. Therefore, the proposed Project *may affect, but is not likely to adversely affect* piping plovers.

6.2.2 Designated Critical Habitat of Piping Plover

The USFWS has designated critical habitat for the Great Lakes and Northern Great Plains populations of piping plover (USFWS 2002). Designated critical habitat for the piping plover includes 183,422 acres and 1,207.5 river miles of habitat, including areas near the proposed

Project, along the shoreline of Lake Sakakawea in McKenzie County, North Dakota (USFWS 2002).

Since the Project would not modify, alter, disturb, or affect the shoreline of Lake Sakakawea or any of its tributary streams in any way, **no effect** to designated critical habitat of the piping plover would occur.

6.3 CANDIDATE SPECIES

6.3.1 Greater Sage-grouse

The greater sage-grouse (*Centrocercus urophasianus*) depends almost exclusively on healthy sagebrush (*Artemisia* sp.), with an understory of grasses and forbs, for year-round survival. The project and analysis area does not contain suitable greater sage-grouse habitat for breeding, nesting, and brood-rearing. The proposed project will have **no effect** on this species at this time.

6.3.2 Dakota Skipper

The Dakota skipper is a small butterfly with a 1-inch wingspan and is found primarily in undisturbed native tall grass and upland dry mixed grass prairie areas with a high diversity of wildflowers and grasses (Committee on the Status of Endangered Wildlife in Canada 2006). The Dakota skipper appears to require a range of precipitation-evaporation ratios between 60 and 105 and a soil pH between 7.2 and 7.9 (McCabe 1981). Larvae feed on grasses, favoring little bluestem. Adults commonly feed on nectar of flowering native forbs such as harebell (*Campanula rotundifolia*), wood lily (*Lilium philadelphicum*), and purple coneflower. The species is threatened by conversion of native prairie to cultivated agriculture or shrublands, over-grazing, invasive species, gravel mining, and inbreeding (USFWS 2005). Dakota skippers are not known to occur within the project area; however, suitable habitat does occur. The proposed Project **may affect, but is not likely to adversely affect** this species. The use of best management practices and conservation guidelines (USFWS 2007) during construction and operation and immediate reclamation of short-term disturbance should decrease direct, indirect, and cumulative impacts to this species.

6.3.3 Sprague's Pipit

The Sprague's pipit is a small passerine, 10 to 15 centimeters in length, endemic to the Northern Great Plains (USFWS 2010h). The Sprague's pipit requires large tracts of native prairie habitat, unplowed, throughout their life cycle. Because native grasslands are disturbance-dependent, Sprague's pipit prefers grassland habitats that are regularly disturbed. The frequency of disturbance required for habitat maintenance depends on how quickly grasses grow to an intermediate height (4 to 12 inches) following a disturbance event.

In North Dakota, Sprague's pipit has been found in areas of moderate grazing. Sprague's pipits are sensitive to patch size and avoid edges between grasslands and other habitat features (USFWS 2010h). They may avoid non-grassland features including roads, trails, oil wells, croplands, woody vegetation, and wetlands. The Sprague's pipit is reported to stay up to 350 meters away from anthropogenic features such as roads, oil wells, and wind turbines (USFWS 2010h). The USFWS has estimated that each new oil well and associated road in North

Dakota results in potential impacts to approximately 51 acres (21 ha) of pipit habitat due to avoidance and habitat fragmentation (USFWS 2010h). Because of increasing habitat fragmentation, especially by energy development, throughout the Sprague's pipit range, and the loss of native prairie habitat, the Sprague's pipit was listed as a Candidate Species under the Endangered Species Act in 2010 (USFWS 2010h).

In North Dakota, Sprague's pipit breeds throughout the state except for the easternmost counties. During the breeding season they prefer large patches of well drained, open native grassland with a minimum size of 358.3 acres (range = 170 to 776 acres). They have not been observed in areas smaller than 71.6 acres on their breeding grounds (USFWS 2010h).

A Sprague's pipit individual was observed within the project area in the NW¹/₄ of the SE¹/₄, Section 27, T148N, R103W, during SWCA's May 2011 survey (Figure 3; see Table 6). Additionally, a known Sprague's pipit nesting site is located approximately 1.3 miles south of the proposed pipeline in the center of Section 16, T147N, R104W (Kadmas, Lee, and Jackson 2010). Native prairie habitat with grasses of intermediate height does occur within the project area. However, the habitat within and surrounding the project area has been previously disturbed by agriculture, roads, and oil and gas development. The proposed project is unlikely to directly affect habitat due to lack of adequate patch sizes required by the Sprague's pipit for breeding grounds in the immediate project area, but may indirectly contribute to reduced use of any nearby suitable grassland habitat patches within 350 meters of the proposed new infrastructure. To minimize potential impacts, construction activities would occur outside of the breeding and nesting period, February 1 to July 15. Therefore, the proposed Project *may affect, but is not likely to adversely affect* Sprague's pipit.

6.4 SENSITIVE SPECIES

6.4.1 Birds

6.4.1.1 American Peregrine Falcon

American peregrine falcons (*Falco peregrinus anatum*) historically nested within the badlands of North Dakota. The last documented breeding pair nested near Bullion Butte in Billings County in 1954 (Stewart 1975). In recent years, peregrine falcons have nested in eastern North Dakota. Peregrine falcons may occasionally use the LMNG habitat during migrations. The species may be most likely to occur along the river and lake systems where waterfowl and shorebird concentrations provide prey opportunities. The project and analysis area does not contain suitable nesting or foraging habitat for peregrine falcons. The proposed project will have *no impact* on this species at this time.

6.4.1.2 Baird's Sparrow

Baird's sparrow (*Ammodramus bairdii*) inhabits areas of ungrazed or lightly grazed tall and mixed-grass prairies throughout North Dakota, dwelling in habitats consisting of blue grama, needle and thread, and little bluestem. Baird's sparrow has been documented in southwestern North Dakota (Dirk 2006), but no individuals were observed during the surveys; however, suitable habitat is found within the project and analysis area. The proposed project *may impact individuals or their habitat but will not likely contribute to a trend toward federal*

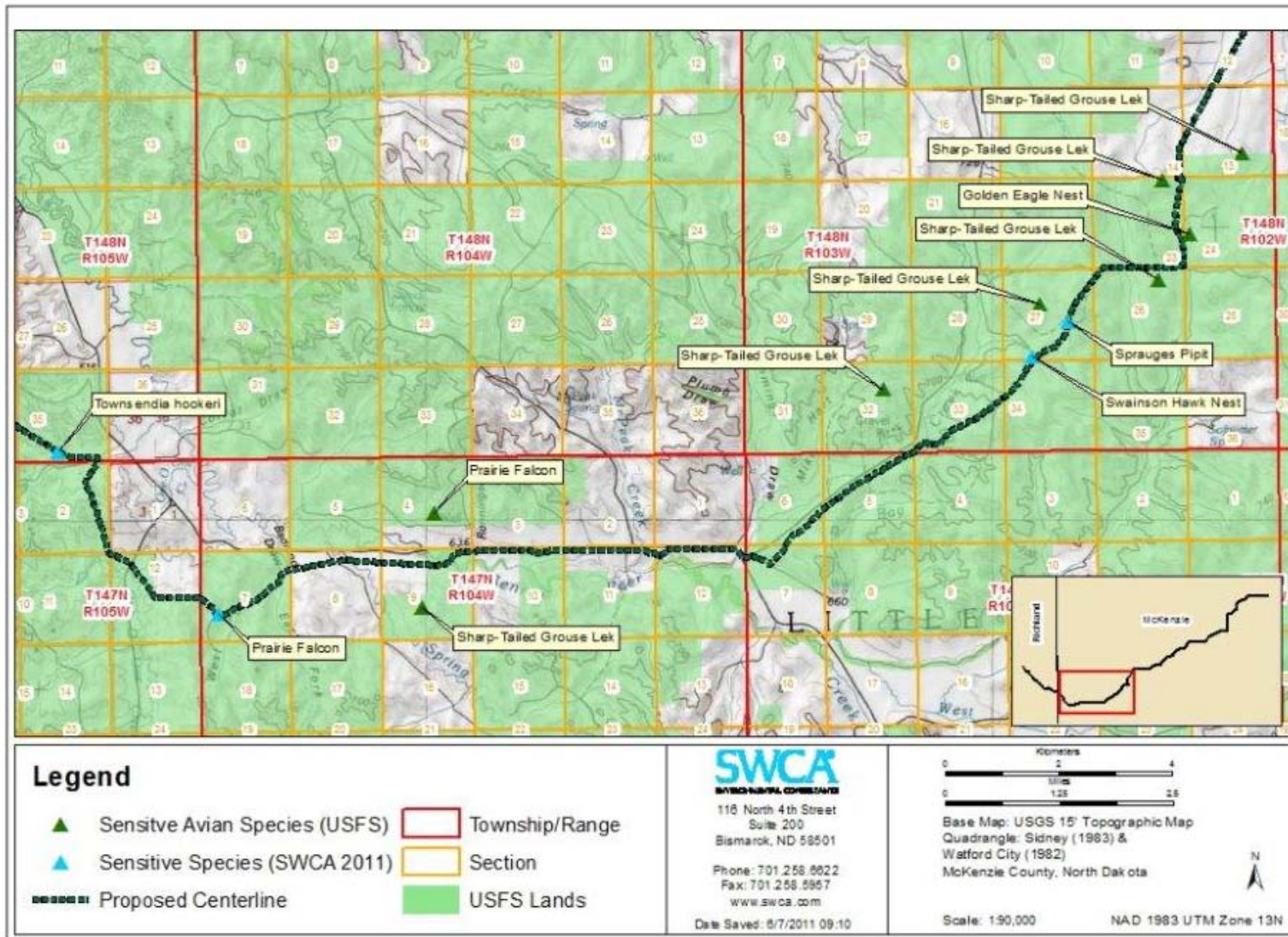


Figure 3. Sensitive wildlife and plant species observed in 2011 and previously documented near the project area.

listing or cause a loss of viability to the population or species. The use of best management practices during construction and operation and immediate reclamation of short-term disturbance should decrease direct, indirect, and cumulative impacts to this species.

6.4.1.3 Burrowing Owl

Burrowing owls (*Athene cunicularia*) use a wide variety of arid and semiarid environments, with well-drained, level to gently sloped areas characterized by sparse vegetation and bare ground. The burrowing owl is a grassland specialist found in open prairie, grassland, desert, and shrub-steppe habitats, as well as agricultural areas. The species almost exclusively associates itself with prairie dog and ground squirrel (*Spermophilus* sp.) colonies and uses the burrows for nesting and roosting (Svingen and Martin 2004). No burrowing owls were observed during field surveys and suitable habitat does not occur within the project or analysis area. The proposed project will have *no impact* on this species at this time.

6.4.1.4 Greater sage-grouse

Greater sage-grouse is discussed in Section 6.3.1.

6.4.1.5 Loggerhead Shrike

Loggerhead shrikes (*Lanius ludovicianus*) occupy open grasslands with shrub thickets or stands of low tress. For nesting, presence of dense shrubs or trees with open herbaceous areas for foraging nearby seems to be important. Loggerhead shrikes were not observed during field surveys; however, suitable habitat is present within the analysis area. The proposed project *may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.* The use of best management practices during construction and operation and immediate reclamation of short-term disturbance should decrease direct, indirect, and cumulative impacts to this species.

6.4.1.6 Long-billed Curlew

The long-billed curlew (*Numenius americanus*) inhabits a variety of grassland types ranging from moist meadow grasslands to agricultural areas and to upland grasslands. The long-billed curlew breeds in the Great Plains, Great Basin, and intermontane valleys of the western United States and southwestern Canada. Migrating long-billed curlews are present in North Dakota from April through August and typically nest from May through June. The species relies on the cover and openness of grasslands to nest and rear young (NRCS 2000). No long-billed curlews were observed in the project area; however, suitable habitat is present within the project and analysis area. The proposed project *may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.* The use of best management practices during construction and operation and immediate reclamation of short-term disturbance should decrease direct, indirect, and cumulative impacts to this species.

6.4.1.7 Sprague's Pipit

Sprague's pipit is discussed in Section 6.3.3.

6.4.2 Mammals

6.4.2.1 Black-tailed Prairie Dog

In North Dakota, black-tailed prairie dogs are known to occur west of the Missouri River and throughout the LMNG. The black-tailed prairie dog is also listed as a management indicator species. Black-tailed prairie dogs inhabit areas with short-stature vegetation and will modify existing vegetation by continual grazing. Black-tailed prairie dogs provide habitat for or serve as a food source for a variety of species, including black-footed ferrets, ferruginous hawk (*Buteo regalis*), swift fox (*Vulpes velox*), burrowing owl, and mountain plover (*Charadrius montanus*). No black-tailed prairie dog towns were observed within the project or analysis area. The proposed project will have **no impact** on this species at this time.

6.4.2.2 Bighorn Sheep

Although bighorn sheep (*Ovis Canadensis*) are known to occur in the analysis area, suitable habitat including badlands and rugged breaks does not occur within the analysis area. No bighorn sheep were observed during field surveys. The proposed project will have **no impact** on this species at this time.

6.4.2.3 Fringed myotis

Myotis thysanodes, the fringed myotis, is a bat found across the western United States including the DPG (USFS 2011c; USFS DPG 2011). This highly migratory species roosts in caves, mine tunnels, rock crevices and old buildings, and feeds mainly on beetles and other insects. The species arrives in their summer habitat after the spring thaw to begin nursery colonies which may contain hundreds of individuals. The colonies have usually dispersed by the end of October (Vingiello 2002). Fringed myotis, like other bat species, is threatened by a fungal disease called “white-nose syndrome.” This disease is caused by the fungus *Geomyces destructans*, which grows in many bat hibernacula and has devastated eastern North American bat populations. There are no specific accounts mortalities with *Myotis thysanodes* as a result of the spread of this disease (National Park Service and Wildlife Health Center, 2010).

Although fringed myotis may occur in the LMNG, suitable habitat such as caves, mine tunnels, rock crevices and old buildings does not occur within the analysis area. The proposed project will have **no impact** on this species at this time.

6.4.2.4 Long-eared myotis

The geographic range of *M. evotis*, or long-eared myotis, includes the DPG (USFS DPG 2011). Long-eared myotis is either solitary or roosts in colonies of up to 30 individuals. Both sexes use a variety of roost sites (Weber and Meyers 2004). Although the long-eared myotis is most commonly found in mixed coniferous forests where they use tree snags and stumps for day roosts, they can also be found roosting in the crevices of sandstone boulders, abandoned buildings, cracks in the ground, caves, mines, and loose bark on living and dead trees. Females may form maternity colonies of 5 to 30 individuals in the summer, or they can remain solitary (Weber and Meyers 2004). The species is insectivorous, feeding mainly on moths, but their diet also includes beetles, flies, and spiders (Weber and Meyers 2004). Long-

eared myotis is active at lower temperatures than other bats and only migrates short distances between summer roosts and winter hibernacula, therefore direct and indirect effects on this species could occur regardless of the timing of construction.

Long-eared myotis may occur in the LMNG, suitable habitat such as caves, mine tunnels, rock crevices and old buildings does not occur within the analysis area. However, the species may be able to use tree snags and stumps that occur in the project area in wooded ravines or lining stream channels, such as that shown in Figure A-4. Daytime roosting in trees within the construction ROW at the same time that construction could take place could lead to indirect loss of habitat or direct effects to individuals. Therefore the proposed project ***may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.***

6.4.2.5 Long-legged myotis

Long-legged Myotis, *M. volans*, is a large myotis with a specialized diet is primarily made up of moths, with other insects accounting for less than 30% of the diet. The long-legged myotis establishes day roosts and hibernacula in trees, rock crevices, fissures in stream banks, and buildings (Hutchinson 2002). Large nursery colonies with hundreds of individuals are commonly formed in trees. Mating occurs in late August or September before the bats enter hibernation. Young are born in mid-summer (Hutchinson 2002).

Like other colonial bat species, long-legged myotis is threatened by a fungal disease called “white-nose syndrome” which grows in many bat hibernacula and has devastated eastern North American bat populations (National Park Service and Wildlife Health Center, 2010).

Mating occurs in late August or September before the bats enter hibernation. Young are born in mid-summer (Hutchinson 2002). Suitable habitat for long-legged myotis, such as caves, mine tunnels, rock crevices and old buildings, does not occur within the analysis area. However, the species may be able to use tree snags and stumps that occur in the project area in wooded ravines or lining stream channels, such as that shown in Figure A-4. Daytime roosting in trees within the construction ROW at the same time that construction could take place could lead to indirect loss of habitat or direct effects to individuals. Therefore the proposed project ***may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.***

6.4.2.6 Townsend’s big-eared bat

Corynorhinus townsendii, or Townsend's big-eared bats, are known to occur in the DPG and are listed as a USFS Sensitive Species (USFS 2011c; USFS DPG 2011). The species is considered a food specialist, feeding almost exclusively on moths (Lepidoptera), with only a small percentage of beetles (Coleoptera), flies (Diptera) and other small insects (Sullivan and Francl 2009). Common roosting sites include caves, cliffs, and rock ledges but have been found in abandoned mines and other man-made structures (Sullivan and Francl 2009). Like other colonial bat species, they are threatened by fungal disease called “white-nose syndrome” (Sullivan and Francl 2009; National Park Service and Wildlife Health Center, 2010).

Although Townsend's big-eared bats, may occur in the LMNG and even forage in the project area, suitable habitat such as caves, abandoned mines, rock ledges, do not occur within the analysis area. The proposed project will have **no impact** on this species at this time.

6.4.3 Insects

6.4.3.1 Dakota Skipper

The Dakota skipper is discussed in Section 6.3.2.

6.4.3.2 Ottoe Skipper

Ottoe skippers (*Hesperia ottoe*) occur in relatively undisturbed, ungrazed native tall grass prairie that are dominated by bluestems, needle grasses (*Nassella* spp.), grama grasses (*Bouteloua* spp.), and large amounts of purple coneflower. The Ottoe skipper is not known to occur within the project or analysis area. The area does include suitable habitat for the species, however. The proposed project **may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species**. The use of best management practices during construction and operation and immediate reclamation of short-term disturbance should decrease direct, indirect, and cumulative impacts to this species.

6.4.3.3 Regal Fritillary Butterfly

Regal fritillary butterflies (*Speyeria idalia*) occur in native prairies that have extensive stands of violets (*Viola* sp.), which are necessary for over-wintering larval survival. This species has been documented in the LMNG in McKenzie and Slope counties (Opler et al. 2006). Extensive stands of violets do not occur within the analysis area, and no individuals were observed during the field surveys. The proposed project will have **no impact** on this species at this time.

6.4.3.4 Tawny Crescent Butterfly

Tawny crescent butterflies (*Phyciodes batesii*) occur in native prairie with prevalent bluestem patches near moist, green ash draws. Larval butterflies feed on woodland asters (*Eurybia divaricata*) (Royer 2006) and adults have been found to feed on dogbane (*Apocynum* sp.) and leafy spurge (*Euphorbia esula*) nectar. Habitat for the tawny crescent butterfly is found within the analysis area. The proposed project **may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species**. The use of best management practices during construction and operation and immediate reclamation of short-term disturbance should decrease direct, indirect, and cumulative impacts to this species.

6.4.3.5 Fish

Northern Redbelly Dace

The northern redbelly dace (*Phoxinus eos*) occurs in clear, low-flow creeks, ponds, and lakes with aquatic vegetation. The northern redbelly dace has been found in tributaries to the Missouri River including Heart, Knife and Cannonball rivers. Populations also occur in the

Rush and Sheyenne rivers. Streams are present within the project area, however it is unlikely that this species occupies these marginal habitats. The proposed project will have ***no impact*** on this species at this time.

6.5 MANAGEMENT INDICATOR SPECIES

6.5.1 Black-tailed Prairie Dog

Black-tailed prairie dogs are discussed in Section 6.4.2.1.

6.5.2 Greater-sage grouse

Greater sage-grouse is discussed in Section 6.3.1.

6.5.3 Sharp-tailed grouse

The sharp-tailed grouse (*Tympanuchus phasianellus*) is found throughout North Dakota grasslands and typically inhabits areas of short vegetation near the tops of rolling hills. Males congregate near a lek area from mid-March through mid-May and again in mid- to late September. Six leks are known to exist within the project or analysis area (Figure 3; personal communication, Ingalls 2011). Sharp-tailed grouse leks occur between 0.17 and 0.72 mile from the pipeline alignment. Sharp-tailed grouse were not observed during field surveys in May 2011. Pipeline construction and reclamation activities would also occur outside the lekking period, March 1 to June 15, to reduce affects on the reproductive success of these species. The proposed project ***may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.***

6.6 RAPTORS

6.6.1 Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) feeds on fish and carrion and typically roosts in large trees near a water source. Bald eagle nesting habitat is typically any mature stands of conifer or cottonwood trees in association with rivers, streams, reservoirs, lakes, or any significant body of water. Bald eagles are uncommon in North Dakota and are usually observed along the Missouri River (Gomes n.d.). Bald eagles frequently migrate through the grassland habitats; however, no bald eagles or nests were observed during the field surveys. Suitable nesting and roosting habitat is not available within the project or analysis area. The proposed project will have ***no impact*** on this species at this time.

6.6.2 Ferruginous Hawk

Ferruginous hawks inhabit open environments such as grasslands, shrub-steppe, and semi-desert shrublands that support abundant populations of prairie dogs, ground squirrels, and jackrabbits (*Lepus* sp.). Ferruginous hawks avoid areas of high human activity, disturbance, and intensive agriculture. The species nests in isolated trees, on rock outcrops, on structures such as power poles, hay bales, and on the ground. Throughout the year, ferruginous hawks position themselves near prey concentrations and avoid dense vegetation that limits their ability to detect and attack prey (Travsky and Beauvais 2005). Ferruginous hawks and their

nests were not observed during field surveys, and no known historical nests occur within the project or analysis area. However, suitable nesting habitat does exist within the analysis area. To minimize potential impacts, construction activities will occur outside of the breeding and nesting period, February 1 to July 15. The proposed project ***may impact individuals or their habitat but will not likely to contribute to a trend toward federal listing or loss of viability to the population or species.***

6.6.3 Golden Eagle

Golden eagles (*Aquila chrysaetos*) have been documented throughout the LMNG and nest on steep cliff faces and in large cottonwood trees along intermittent creeks. Golden eagles have been documented in the LMNG year-round; however, the majority of golden eagles migrate. The breeding season for golden eagles is from mid-March through late July. A golden eagle was observed during the field surveys, and nests have been document within the project analysis area. Three nests are known to exist near the project area, in Sections 22, 23, and 24, T148N, R130W (personal communication, Ingalls 2011; Kadrmas, Lee, and Jackson 2010). These nests were not observed during surveys in May 2011 or during surveys conducted in June 2010 by Kadrmas, Lee, and Jackson (2010). However, suitable nesting habitat does exist within the analysis area (see Figure 3). To minimize potential impacts, construction activities will occur outside of the breeding and nesting period, February 1 to August 15. Therefore, the proposed project ***may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.***

6.6.4 Merlin

The merlin (*Falco columbarius*) occurs throughout the LMNG. Merlins nest within abandoned crow (*Corvus* sp.) and magpie (Corvidae) nests in green ash draws and ponderosa pine (*Pinus ponderosa*) forested areas. Breeding occurs between mid-May through late July. No merlins were observed during field surveys, and no known nests occur within the project or analysis area. Suitable nesting habitat does occur within the analysis area in forested draws. To minimize potential impacts, construction activities will occur outside of the breeding and nesting period, February 1 to August 15. The proposed project ***may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or loss of viability to the population or species.***

6.6.5 Prairie Falcon

Prairie falcons (*Falco mexicanus*) occur throughout the LMNG and build aeries on cliff faces of badlands and towering buttes. The breeding season occurs from early April through mid-July. A prairie falcon was observed during field surveys in the NW¹/₄ of the SW¹/₄, Section 7, T147N, R104W, and was suspected to have a nest within 0.25 mile of the project area (see Figure 3). A prairie falcon nest was also recorded in 1981 in Section 5, T147N, R104W (Kadrmas, Lee, and Jackson 2010). To minimize potential impacts, construction activities will occur outside of the breeding and nesting period, February 1 to August 15. The proposed project ***may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.***

7.0 ASSESSMENT OF PLANT SPECIES

7.1 SENSITIVE SPECIES

7.1.1 Smooth Goosefoot (*Chenopodium subglabrum*)

Smooth goosefoot is an early succession annual. The species is considered xerophytic, halophytic, and alkali tolerant (Yellowfield Biological Surveys 2002), and it can be found in sparsely vegetated, actively disturbed, and sandy riparian areas. These include sand dunes, sand bars, blowouts, and sandy floodplain terraces (Committee on the Status of Endangered Wildlife in Canada 2006). The species will appear in a variety of sandy textures and levels of disturbance; however, it includes components of active sand. In the DPG, populations often appear on south- or west-facing slopes (Yellowfield Biological Surveys 2007). Smooth goosefoot was not observed in the project area during field surveys in 2011 or 2010 (Kadrmaz, Lee, and Jackson, 2010). Suitable habitat was not present in the project area in 2010 (Kadrmaz, Lee, and Jackson 2010). However, suitable habitat may be present in the sandy areas and creek areas along the proposed route (personal communication, Powell 2011b). Therefore, the proposed project ***may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.***

7.1.2 Visher's Buckwheat (*Eriogonum visherii*)

Visher's buckwheat habitat consists of barren, predominantly clay and sandy/clay outwash sites and open outcrops (Schmoller 2000). These outwashes can be found at the base of badland buttes and other erosional features (Ladyman 2006). The soils where Visher's buckwheat is found have very little development, if any, and are often Entisols (NatureServe 2011). The absence of developed soils is common. Visher's buckwheat was not observed in the project area during field surveys; however, suitable habitat is present. The proposed project ***may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.*** The use of best management practices during construction and operation and immediate reclamation of short-term disturbance should decrease direct, indirect, and cumulative impacts to this species.

7.1.3 Maiden Blue-eyed Mary (*Collinsia parviflora*)

Maiden blue-eyed Mary is an annual species associated with shady mesic habitats and woody draws. The species can often be found on north- and east-facing slopes on buttes (Lenz 1994). Maiden blue-eyed Mary was not observed in the project area during field surveys; however, suitable habitat is present. The proposed project ***may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.*** The use of best management practices during construction and operation and immediate reclamation of short-term disturbance should decrease direct, indirect, and cumulative impacts to this species.

7.1.4 Torrey's Cryptantha (*Cryptantha torreyana*)

Torrey's cryptantha is an annual and often found on the hillsides or slopes of buttes (personal communication, Jake Powell, 2010a). Torrey's cryptantha was not observed in the project

area during field surveys and suitable habitat is not present within the project area. The proposed project ***may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.***

7.1.5 Nodding Buckwheat (*Eriogonum cernuum*)

Nodding buckwheat is an annual forb that has been observed on sandstone knobs and foothills within grassy plains. Sites include sandy areas and rocky outcrops (Yellowfield Biological Surveys 2003). Nodding buckwheat was not observed in the project area during field surveys; however suitable habitat is not present within the project area. The proposed project ***may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.***

7.1.6 Missouri Pincushion Cactus (*Escobaria missouriensis*)

Missouri pincushion cactus is found in the southwestern quarter of North Dakota. The Missouri pincushion cactus is found in arid areas or dry conditions caused by heavy grazing (USGS 2011). Missouri pincushion cactus was not observed in the project area during field surveys however suitable habitat is present within the project area. The proposed project ***may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.***

7.1.7 Common Starlily (*Leucocrinum montanum*)

Common starlily is a perennial forb found in sandy soils and disturbed areas in shortgrass prairies and foothills (USGS 2010). Common starlily was not observed in the project area during field surveys however suitable habitat is present within the project area. The proposed project ***may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.***

7.1.8 Dwarf Mentzelia (*Mentzelia pumila*)

Dwarf mentzelia can be found in open areas, in desert shrubland and woodland (Montana Field Guide 2010). The species inhabits sandy soils at lower elevational zones. Dwarf mentzelia was not observed in the project area during field surveys; however suitable habitat is present within the project area. The proposed project ***may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.***

7.1.9 Alyssumleaf Phlox (*Phlox alyssifolia*)

Alyssumleaf phlox is a perennial subshrub that occurs in the cracks of rocky sandstone outcrops and disturbed areas often near the summits of buttes. The areas are sparsely vegetated with exposed thin soil, high runoff, and full sun (Yellowfield Biological Surveys 2003). Alyssumleaf phlox was not observed in the project area during field surveys however, suitable habitat is present within the project area. The proposed project ***may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species.***

7.1.10 Limber Pine (*Pinus flexilis*)

Limber pine is a perennial tree species that is near the edge of its range in North Dakota. Within its range the species typically inhabits dry, rocky sites. In forested areas limber pine occurs in low densities on mesic sites (NatureServe 2011). Limber pine was not observed in the project area during field surveys and suitable habitat is not present within the project area. The proposed project will have *no effect* on this species at this time.

7.1.11 Lanceleaf Cottonwood (*Populus xacuminata*)

Lanceleaf cottonwood is a perennial tree that is a hybrid of *Populus angustifolia* and *P. deltoides*. This species is found in riparian areas and floodplains where soils are moist and water availability is high. Lanceleaf cottonwood was not observed in the project area during field surveys however suitable habitat or species were noted within the analysis area. The proposed project *may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species*.

7.1.12 Alkali Sacaton (*Sporobolus airoides*)

Alkalki sacaton is a perennial grass species that is generally found in both saline and non-saline soils but is often found in areas with high salt concentrations (Johnson 2000). Alkalki sacaton was not observed in the project area during field surveys however suitable habitat is present within the project area around the occasional badland outcrops. The proposed project *may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species*.

7.1.13 Easter Daisy (*Townsendia exscapa*)

The Easter daisy can be found in the western fourth of North Dakota within a variety of dry soils and occasionally in rock crevices (USGS 2011). Easter daisy was not observed within the project area during field surveys, however *Townsendia hookeri* was observed. Suitable habitat is present within the project area. The proposed project *may impact individuals or their habitat but will not likely contribute to a trend toward federal listing or cause a loss of viability to the population or species*.

7.1.14 Hooker's Townsend Daisy (*Townsendia hookeri*)

Hooker's Townsend daisy can be found on dry open sites, including scoria outcrops and old road beds (personal communication, Powell 2011b). Hooker's Townsend daisy was observed in the project area during field surveys and suitable habitat is present. *Townsendia hookeri* was discovered during the survey in one location (see Appendix B for Site and Setting and Sensitive/Watch Plant Population Survey Forms). It is possible that the plants are *Townsendia exscapa* and not *Townsendia hookeri*, however, the DPG has taken the stance that all individuals will be considered *Townsendia hookeri* until the plants can be accurately identified through genetic analysis (personal communication, Jake Powell, 2011a). The areas where *Townsendia hookeri* was potentially found were delineated by walking around the area where plants occurred. These areas are shown on Figure 3. Approximately three individual plants were documented occurring in this area, in the SE $\frac{1}{4}$ of the SW $\frac{1}{4}$, Section 35, T148N, R105W. For photographs of the plants see Figures A.7 and A.8 in Appendix A. The proposed project *may impact individuals or their habitat but will not likely contribute to a trend toward*

federal listing or cause a loss of viability to the population or species. The use of best management practices during construction and operation and immediate reclamation of short-term disturbance should decrease direct, indirect, and cumulative impacts to this species.

7.2 ADDITIONAL SPECIES

All species encountered within the survey area were recorded and are listed in Table 7. All scientific and common names were checked against the NRCS (2011b) PLANTS Database. No watch list species were discovered within the project area.

Table 7. Plant Species Documented in the Survey Area

Family	Genus	Species	Common Name
Anacardiaceae	<i>Rhus</i>	<i>glabra</i>	smooth sumac
Asteraceae	<i>Artemisia</i>	<i>frigida</i>	prairie sagewort
Cactaceae	<i>Opuntia</i>	spp.	pricklypear
Caprifoliaceae	<i>Lonicera</i>	spp.	honeysuckle
Cupressaceae	<i>Juniperus</i>	<i>communis</i>	common juniper
Cupressaceae	<i>Juniperus</i>	<i>horizontalis</i>	creeping juniper
Fabaceae	<i>Astragalus</i>	<i>gilviflorus</i>	plains milkvetch
Fabaceae	<i>Thermopsis</i>	<i>rhubifolia</i>	prairie thermopsis
Oleaceae	<i>Fraxinus</i>	<i>pennsylvanica</i>	green ash
Oleaceae	<i>Syringa</i>	<i>vulgaris</i>	common lilac
Pinaceae	<i>Pinus</i>	<i>ponderosa</i>	ponderosa pine
Poaceae	<i>Aristida</i>	<i>purpuria</i>	blue threeawn
Poaceae	<i>Agropyron</i>	<i>cristatum</i>	crested wheatgrass
Poaceae	<i>Pascopyrum</i>	<i>smithii</i>	western wheatgrass
Poaceae	<i>Poa</i>	<i>pratensis</i>	Kentucky bluegrass
Poaceae	<i>Bouteloua</i>	<i>curtipendula</i>	sideoats grama
Poaceae	<i>Bouteloua</i>	<i>gracilis</i>	blue grama
Poaceae	<i>Bromus</i>	<i>inermis</i>	smooth brome
Poaceae	<i>Calamovilfa</i>	<i>longifolia</i>	prairie sand reed
Poaceae	<i>Distichlis</i>	<i>spicata</i>	saltgrass
Polemoneaceae	<i>Phlox</i>	<i>hoodii</i>	spiny phlox
Ranunculaceae	<i>Pulsatilla</i>	<i>patens</i>	cutleaf anemone

Table 7. Plant Species Documented in the Survey Area (Continued)

Family	Genus	Species	Common Name
Rosaceae	<i>Prunus</i>	<i>virginiana</i>	chokecherry
Rosaceae	<i>Prunus</i>	<i>americana</i>	American plum
Rosaceae	<i>Rosa</i>	<i>arkansana</i>	prairie rose
Salicaceae	<i>Populus</i>	<i>deltoides</i>	narrowleaf cottonwood
Ulmaceae	<i>Ulmus</i>	<i>americana</i>	American elm
Ulmaceae	<i>Ulmus</i>	<i>pumila</i>	Siberian elm

8.0 CUMULATIVE EFFECTS

The cumulative impacts analysis area (CIAA), identified as the area within 0.5 mile of the proposed pipeline, consists of fee land and USFS lands. These areas currently have multiple uses, including agriculture, livestock grazing, recreation, and oil and gas extraction. Cumulative effects on sensitive and listed vegetation includes direct loss of individuals or populations from ground-disturbing activities, as well as indirect impacts from introduction of non-native species, and various effects on soils, surface water, and groundwater making up the substrate for maintaining many sensitive and rare plant species. Assessment of aerial photography provides an estimate of the number, acreage, and type of existing land disturbance, provided in Table 8.

Table 8. Estimated Existing Land Disturbance within 0.5 mile of the Proposed Project

Number of Individual Occurrences	Disturbance	Disturbance Type	Acres of Disturbance
17	Agriculture	Agricultural field	941.52
1	Well	Confidential	2.88
3	Domestic	Domestic	51.33
30	Well	Oil and gas	78.53
16	Transportation	State and County Roads	234.55
Total			1,308.81

Based on this information, approximately 1,308.81 acres of existing disturbance occurs within 0.5 mile of the proposed pipeline. The majority of the disturbance, 72%, is agricultural disturbance. Approximately 30 oil and gas well pads within 0.5 mile of the project area (see Table 8) (North Dakota Industrial Commission 2011). Spatial analysis of digital aerial photography indicates that the total existing disturbance from oil and gas development accounts for approximately 78.53 acres of disturbance.

The Lewis and Clark Replacement pipeline was recently constructed parallel to the proposed alignment. The disturbance associated with this pipeline does not appear in Table 7. This pipeline was 76,000 linear feet and approximately 270 acres of temporary disturbance on USFS lands. Bear Paw's continued operation and maintenance of the Lewis and Clark pipeline includes the potential replacement of approximately 5,200 feet existing pipeline. Replacement activities would most likely occur in 2011, and would be coordinated with the construction of this Project. Reclamation of the 2010 disturbance is in progress, and no other future pipeline construction is planned or proposed within 1 mile of the project area.

Short-term disturbance would result in predominately Northwestern Great Plains Mixedgrass Prairie habitats. No surface occupancy would be associated with this Project, and soils and vegetation disturbed during construction of the proposed pipeline would be immediately

reclaimed using native seed mixtures appropriate to the Project area. The proposed pipeline project would add 0 acres of long-term habitat disturbance after reclamation. Therefore, the Project is not likely to add significantly to direct cumulative impacts in the area, or result in adverse cumulative impacts to sensitive species. Indirect cumulative effects of pipeline construction and operation on soils and water resources would be mitigated through several best management practices and conservation measures, as discussed in Section 8.1. As a result of these considerations, the proposed Project is unlikely to add significant additive or other cumulative effects on sensitive plant species, or otherwise result in significant cumulative impacts in the CIAA.

8.1 CONSERVATION MEASURES

Best management practices should be implemented during construction and operation to help decrease impacts and reduce cumulative effects on all plant and wildlife communities. Best management practices should be implemented that limit the spread of invasive species and noxious weeds, prevent erosion, and prevent spills or other contamination. Reclamation of the site should follow USFS guidelines (USFS 2005c).

Additionally, the following measures would be used to minimize species-specific impacts:

Hooker's Townsend daisy—Within the proposed alignment, habitat areas containing Hooker's Townsend daisy were documented within the projected short-term disturbance corridor, although they do not intersect the alignment. For *Townsendia hookeri*, a 25-foot buffer would be maintained. The centerline sits approximately 38 feet from the occurrences so no reroute is currently proposed.

Raptors and migratory birds—Construction activities will occur outside of the breeding and nesting period, February 1 to July 15. If construction of the project is delayed or continues into future breeding seasons, it is recommended that a ground raptor survey be performed to search for new nests to ensure that no raptors of concern would be disturbed by the proposed activities.

Sharp-tailed grouse leks—Construction activities will be limited within 1 mile of active sharp-tailed grouse leks from March 1 to June 15.

8.2 DETERMINATION

The proposed project would have no effect on black-footed ferret, gray wolf, greater sage-grouse, or designated critical habitat for piping plover. Interior least tern, whooping crane, and piping plover have the potential to occur within the project area as migrants. As a result these species may be, but are not likely to be, adversely affected by the Project. Dakota skipper and Sprague's pipit, candidate species, have suitable habitat within the project area and a Sprague's pipit was observed within the project area; therefore they may be, but are not likely to be, adversely affected by the Project.

Suitable habitat for 12 sensitive animal species and four raptor species exists within the project or analysis area. No historical prairie dog towns are within 0.5 mile of the project area. Six sharp-tailed grouse leks are known to occur within 0.5 mile of the project area. A golden

eagle was observed during the field surveys, and three historical nests have been documented within the project analysis area; however these nests were not observed in 2010 or 2011 surveys. A prairie falcon was observed during field surveys and was suspected to have a nest within 0.25 mile of the project area. To minimize potential impacts to these sharp-tailed grouse and raptors, conservation measures as outlined in Section 8.1 would be put into place. Therefore, the project may impact individuals or habitat for some species, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Within the proposed alignment, habitat areas containing Hooker's Townsend daisy were documented within the projected short-term disturbance corridor although they do not intersect the alignment. For Hooker's Townsend daisy a 25-foot buffer will be maintained. The proposed Project ***may impact individuals or habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.***

Suitable habitat was identified for a number of other special status or sensitive species: smooth goosefoot, maiden blue-eyed Mary, Torrey's cryptantha, nodding buckwheat, Missouri pincushion, Visher's buckwheat, common starlily, dwarf mentzelia, alyssumleaf phlox, lanceleaf cottonwood, alkali sacaton, and Easter daisy. The proposed Project would result in no long-term disturbance, after restoration of pipeline and access road construction disturbance. Therefore, the proposed Project may impact habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the above-listed species.

Based on the existing conditions, activities, proposed disturbance, and current status of species of concern, the proposed Project is not likely to contribute to a trend towards federal listing or cause a loss of viability to any population or species. At this time, proposed development should not result in cumulative effects that will impact the status of sensitive species, and would have negligible impacts on the overall landscape.

9.0 LIST OF CONTACTS AND PREPARERS

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APPENDIX A
Site Photographs



Figure A.1. View of the project area. Note existing pipeline disturbance area within agricultural field.



Figure A.2. View of the agricultural field in project area.



Figure A.3. View of the project area facing northwest from NE $\frac{1}{4}$ of the NW $\frac{1}{4}$, Section 26, T149N, R101W.



Figure A.4. View of the project area facing northeast from NE $\frac{1}{4}$ of the NW $\frac{1}{4}$, Section 26, T149N, R101W.



Figure A.5. View of the stream crossing facing northeast.



Figure A.6. View of Swainson's hawk nest located in SE $\frac{1}{4}$ of the SW $\frac{1}{4}$, Section 27, T148N, R103W.



Figure A.7. View of potential *Townsendia hookeri* within Population 1.



Figure A.8. View of potential *Townsendia hookeri* within Population 1.

APPENDIX B
Site and Setting Forms and
Sensitive/Watch Plant Population Survey Forms

SITE AND SETTING FORM

Site and Setting Form for Inventory Information

<i>SITE ID: BEAR PAW GARDEN CREEK NGL PIPELINE</i>
<i>DATE (MMDDYY): 05082011</i>
Project Name: Bear Paw Garden Creek NGL Pipeline
Site Sample Type: FLGE

<i>LAST Name(s) Binstock and Mclean</i>		<i>FIRST Name (s) Levi and Kyle</i>	
Ownership : USFS			
Region : 01	National Forest/Grassland : 18	District : 08	
State: North Dakota	County Number: 053	County Name: McKenzie	

Location Information

<i>USGS Quad Name: Sidney SE, 47104-E1</i>		
Township / Range / Section 148 N/ 105 W/ 34		
Q SEC NW	QQ SEC	QQQ SEC

Geodetic Datum NAD83 is required			
Lat dms:	Degrees _47_ N	Minutes _35	Seconds _30_.
Long dms:	Degrees _104_ W	Minutes _01	Seconds _23_.

Existing Vegetation Information

Please enter major dominance types found on the project area.

Dominant Life Form: GL
Dominance Type: None – Growing on pipeline scar

Potential Vegetation Information

Vegetation Type	Acres Within Construction Area	Percent of Construction Impact Area
Barren	0.14	0.09
Agriculture-Cultivated Crops and Irrigated Agriculture	0.11	0.07
NASS-Close Grown Crop	0.10	0.06
NASS-Fallow/Idle Cropland	0.00	0.00
NASS-Row Crop-Close Grown Crop	0.01	0.01
Introduced Upland Vegetation-Perennial Grassland and Forbland	12.65	7.98
Northwestern Great Plains Mixedgrass Prairie	135.62	85.52

Biological Assessment and Evaluation for Wildlife Species and Sensitive Plant Species for the Garden Creek NGL Pipeline, McKenzie County, North Dakota

Inter-Mountain Basins Big Sagebrush Steppe	0.12	0.08
Northwestern Great Plains Shrubland	1.36	0.86
Herbaceous Semi-wet	2.13	1.34
Western Great Plains Depressional Wetland Systems	2.91	1.83
Western Great Plains Floodplain Systems	0.30	0.19
Western Great Plains Sand Prairie	1.58	1.00
Western Great Plains Sparsely Vegetated Systems	0.62	0.39
Western Great Plains Wooded Draw and Ravine	0.91	0.58
Total	158.56	100.00%

Source: LANDFIRE (2006)

Description of past and current land use practices including reclaimed or active oil wells, roads, utility corridors, misc. developments, and apparent livestock grazing patterns. Include observations of species composition in regards to native versus non-native (invasive).

Active and ongoing oil and gas development, pipeline disturbance, livestock grazing.

Estimate current acreage or mileage of active and reclaimed access roads, utility corridors, or other developments within ½ mile radius of project area. Document source of data as observed or compiled from GIS software and/or aerial photographs.

ACTIVE

Estimated Existing Land Disturbance within 0.5 mile of the Proposed Project

Number of Individual Occurrences	Disturbance	Disturbance Type	Acres of Disturbance
17	Agriculture	Agricultural field	941.52
1	Well	Confidential	2.88
3	Domestic	Domestic	51.33
30	Well	Oil and gas	78.53
16	Transportation	State and County roads	234.55
Total			1,308.81

Based on this information, approximately 1,308.81 acres of existing disturbance occurs within 0.5 mile of the proposed pipeline. The majority of the disturbance, 72%, is agricultural disturbance. Approximately 30 oil and gas well pads exist within 0.5 mile of the project area, as shown in the table above (North Dakota Industrial Commission 2011). Spatial analysis of digital aerial photography indicates that the total existing disturbance from oil and gas development accounts for approximately 78.53 acres of disturbance.

RECLAIMED

The Lewis and Clark Replacement pipeline was recently constructed parallel to the proposed alignment. The disturbance associated with this pipeline does not appear in the above table. This

pipeline was 76,000 linear feet and approximately 270 acres of temporary disturbance on USFS lands. Bear Paw's continued operation and maintenance of the Lewis and Clark pipeline includes the potential replacement of approximately 5,200 feet existing pipeline. Replacement activities would most likely occur in 2011, and would be coordinated with the construction of this Project. Reclamation of the 2010 disturbance is in progress, and no other future pipeline construction is planned or proposed within 1 mile of the project area.

Other Comments

The cumulative impacts analysis area (CIAA), identified as the area within 0.5 mile of the proposed pipeline, consists of fee land and USFS lands. These areas currently have multiple uses, including agriculture, livestock grazing, recreation, and oil and gas extraction. Cumulative effects on sensitive and listed vegetation include direct loss of individuals or populations from ground-disturbing activities, as well as indirect impacts from introduction of non-native species, and various effects on soils, surface water, and groundwater making up the substrate for maintaining many sensitive and rare plant species.

Short-term disturbance would result in predominately Northwestern Great Plains Mixedgrass Prairie habitats. No surface occupancy would be associated with this Project, and soils and vegetation disturbed during construction of the proposed pipeline would be immediately reclaimed using native seed mixtures appropriate the Project area. The proposed pipeline project will add 0 acres of long-term habitat disturbance after reclamation. Therefore, the Project is not likely to add significantly to direct cumulative impacts in the area, or result in adverse cumulative impacts to sensitive species. Indirect cumulative effects of pipeline construction and operation on soils and water resources would be mitigated through several best management practices and conservation measures, as discussed in Section 8.1. As a result of these considerations, the proposed Project is unlikely to add significant additive or other cumulative effects on sensitive plant species, or otherwise result in significant cumulative impacts in the CIAA.

SENSITIVE/WATCH PLANT POPULATION SURVEY FORM

DATE OF SURVEY: 05 / 08 / 2011

OBSERVER(S): Levi Binstock, Kyle Mclean

LOCATION/POSITION TITLE (Forest/District of observer(s)): Dakota Prairie Grasslands

TAXONOMY: FAMILY: Asteraceae SCIENTIFIC NAME: Townsendia hookeri

LOCATION (**ATTACH COPY OF PERTINENT TOPOGRAPHIC MAP SECTION, WITH POPULATION LOCATIONS):

COUNTY: McKenzie USGS QUAD: Sidney SE, 47104-E1

TOWNSHIP: 148N RANGE: 105W SEC.(S): 34 1/4 SEC.: NW

LATITUDE: 47°35'30"

LONGITUDE: 104° 01' 23" W
(degrees, minutes, seconds, with NAD83 Datum)

OR UTM at Zone 13 Northing Easting

ELEVATION (at population center (and range if known)): unknown

NATIONAL FOREST: Dakota Prairie Grasslands RANGER DISTRICT: McKenzie

LAND OWNERSHIP/MANAGEMENT (IF NOT FS): _____

SITE NAME (usually based on an adjacent landmark): 1

LOCATION OF SITE (refer to roads, trails, geogr. features, etc.): Site was located along previous pipeline disturbance in grazed rangeland.

HABITAT:

ASPECT (S, SE, NNW, etc.): N % SLOPE: 10

LIGHT EXPOSURE (open, shaded, etc.): Open

TOPOGRAPHIC POSITION (crest, midslope, bottom, etc.): Midslope

MOISTURE (saturated, dry, etc.): Dry

VEGETATION STRUCTURE WITH POPULATION AREA:

TOTAL TREE COVER (%) 0 TOTAL SHRUB COVER (%) 0

TOTAL FORB COVER (%) 25 TOTAL GRAMINOID COVER (%) 50

TOTAL MOSS/LICHEN COVER (%) 0 TOTAL BARE GROUND (%) 25

ASSOCIATED PLANT COMMUNITY (dominant species): Agrophyron smithii, Boutelova gracilis, Actemisia frigida, Opuntia polycantha, Boutelesa curtipedula

HABITAT TYPE (if known): Grazed, native rangeland, previously disturbed

ADDITIONAL ASSOCIATED PLANT SPECIES: *Phlox hoodii*, *Astragalus gilviflorus*, *Nassella viridula*, *Thermopsis chombiflora*

SOIL TYPE/TEXTURE (include type of bedrock, if known): Cherry-Cabba silt loam 9% to 40% slope

POPULATION SIZE:

ESTIMATED # OF INDIVIDUALS (or exact count, if feasible; if plants are spreading vegetatively, indicate number of aerial stems): 3 plants

OF SUBPOPULATIONS (if applicable): N/A

SIZE OF POPULATION AREA (acres): N/A – small population within 20 square feet

BIOLOGY:

PHENOLOGY (% flower, fruit, dispersed fruit, vegetative): flowered, healthy specimens

ANY SYMBIOTIC OR PARASITIC RELATIONSHIPS?: N/A

EVIDENCE OF DISEASE, PREDATION OR INJURY?: N/A

EVIDENCE OF SEED DISPERSAL AND ESTABLISHMENT: N/A

DOCUMENTATION:

PHOTOGRAPH TAKEN? (if so, indicate photographer and repository): Yes, Kyle Mclean

SPECIMEN TAKEN? (if so, list collector, collection #, and repository): No

IDENTIFICATION (list name of person making determination, and/or name of flora or book used): Levi Binstock, *Handbook of North Dakota Plants* O.A. Stevens

ECODATA PLOT NUMBER (attach photocopied data sheets):

EVIDENCE OF DISTURBANCE: Found in grazed rangeland, along pipeline reclamation area.

MEASURES FOR PROTECTION: Avoidance is recommended (25-foot buffer around sensitive species).