

**Cedar Creek Anticline Enhanced Oil Recovery Unit Development Project
Resource Report for Aquatics, Vegetation, and Wildlife**

April 2018

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LIST OF ACRONYMS

BLM	Bureau of Land Management
EOR	Enhanced Oil Recovery
ESD	Ecological Site Description
LANDFIRE	Landscape Fire and Resource Management Planning Tools Project
MCFO	Miles City Field Office
MNHP	Montana Natural Heritage Program
MTFWP	Montana Fish, Wildlife & Parks
NRCS	Natural Resources Conservation Service
POD	Plan of Development
SWCA	SWCA Environmental Consultants
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

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1.0 INTRODUCTION

This report describes the aquatic resources, vegetation cover types, wildlife resources, and special status aquatic, plant, and wildlife resources potentially affected by the Denbury Onshore, LLC (Denbury) Cedar Creek Anticline Enhanced Oil Recovery (EOR) Unit Development Project (Project). This development will involve mineral extraction operations primarily south and east of the city of Baker, in Fallon County, Montana.

Denbury proposes to conduct development, operation, and reclamation of production and injection wells and various facilities within a field development that spans three existing oil field units: East Lookout Butte, Coral Creek, and the southern portion of Pennel (see the Plan of Development [POD] for additional information). The majority of the Project area is located on privately owned lands, but the Project also includes county, municipal, state, and Bureau of Land Management (BLM)-administered lands. Although the footprints of the development have yet to be determined, they will include the refurbishment of existing wells, the construction of a network of flowlines, new EOR facilities, and new production and injection wells.

The Project area supports a variety of aquatic, vegetation, and wildlife resources, some of which are designated as special status by the U.S. Fish and Wildlife Service (USFWS) or the BLM. Denbury contracted SWCA Environmental Consultants (SWCA) to conduct biological resource surveys for due diligence and planning purposes.

Additional supporting information is provided in the following attachments to this resource report.

- Attachment 1 – Figures
- Attachment 2 – Montana/Dakotas BLM Sensitive Species Occurrence Information for Species Excluded from Further Discussion
- Attachment 3 – Delineated Wetlands and Waterbodies Table
- Attachment 4 – Black-tailed Prairie Dog Survey Data Forms
- Attachment 5 – Northern Long-eared Bat Habitat Assessment Addendum
- Attachment 6 – Black-footed Ferret Survey Report
- Attachment 7 – Resumes

2.0 AQUATIC BIOLOGICAL RESOURCES

Aquatic habitats within the Project area include intermittent streams, wetlands, ponds, and reservoirs. Aquatic biological resources using these habitats include fish, invertebrates, and amphibians. Detailed discussions are provided below for fish, invertebrates, and amphibians that have habitat within the Project area. BLM sensitive aquatic species are discussed in Section 5.2.

2.1 AQUATIC HABITAT

The proposed Project occurs within two fourth-level hydrologic units: O’Fallon (hydrologic unit code 10100005) and Upper Little Missouri (hydrologic unit code 10110201). These units are in the Lower Yellowstone River and the Little Missouri River drainages, respectively. Sandstone Creek and its tributaries drain the northern and western portions of the Project area in the O’Fallon watershed. Sandstone Creek drains into O’Fallon Creek which converges with the Yellowstone River in Prairie County. Buffalo Creek, Corral Creek, and Waterhole Creek drain the eastern and southern portions of the Project area within the Upper Little Missouri watershed. Waterhole Creek converges with Corral Creek less than 1 mile outside the Project boundary. Buffalo Creek and Corral Creek flow into Little Beaver Creek in Bowman County, North Dakota. Little Beaver Creek is a tributary to the Little Missouri River. Fisheries resources presented within this section include aquatic habitat and game and native fish populations present within the Project area and in nearby downstream waterbodies.

2.2 FISH SPECIES

Within the Project area, fish species are managed by the Montana Fish, Wildlife & Parks (MTFWP), with coordination and cooperation with federal agencies such as the BLM and USFWS. Collectively, MTFWP and the federal agencies develop and implement management plans and strategies for both game and nongame fish species and determine management practices that involve fishing regulations and habitat protection. Management plans include the *Montana Statewide Fisheries Management Plan* (MTFWP 2013) and *Montana’s Comprehensive Fish and Wildlife Conservation Strategy* (MTFWP 2005). No BLM sensitive fish species have the potential to occur in the Project area (see Section 5.2.3).

The Little Missouri River drainage is managed as a general conservation fishery. Walleye (*Sander vitreus*), the only fish species stocked in any flowing waterbody in the drainage, are stocked in Beaver Creek (MTFWP 2013). Other game fish species, such as rainbow trout (*Oncorhynchus mykiss*), largemouth bass (*Micropterus salmoides*), crappie (*Pomoxis* spp.), and northern pike (*Esox lucius*), are stocked in private ponds and reservoirs. The primary management focus is to improve fish passage around existing infrastructure and ensure that future structures provide for adequate stream function and passage. There are no special management issues in the Little Missouri River drainage (MTFWP 2013).

The portion of Little Missouri River downstream of the project does not flow through Montana, but several creeks that drain the Project area are tributaries to that river. Fish species of conservation priority in the Little Missouri River in North Dakota are the blue sucker (*Cycleptus elongates*), sturgeon chub (*Macrhybopsis gelida*), sicklefin chub (*M. meeki*), northern redbelly dace (*Chrosomus eos*), and flathead chub (*Platygobio gracilis*) (Dyke et al. 2015).

Surveys have been completed in portions of Buffalo Creek, Corral Creek, and Waterhole Creek within the field development boundary, and in Sandstone Creek downstream of the Project (see map in Attachment 1). Creek chub (*Semotilus atromaculatus*) has been found in both Buffalo and Corral Creeks. White sucker (*Catostomus commersoni*) has been found in both Buffalo and Waterhole Creeks. Brook stickleback (*Culaea inconstans*) has been found in Waterhole Creek.

Fathead minnow (*Pimephales promelas*) has been found in all three creeks (MTFWP 2015a). Surveys conducted downstream of the Project area in South Fork Buffalo Creek have recorded creek chub, fathead minnow, and western silvery minnow (*Hybognathus argyritus*). All five species are native to the eastern prairie ecoregions of Montana (Montana Natural Heritage Program [MNHP] 2015; MTFWP 2015a). The project boundary is within the native range for brook stickleback, which has been introduced elsewhere in the state (MNGP and MTFWP 2018).

Sandstone Creek and tributaries are the only streams in the Lower Yellowstone River drainage that flow from the Project area. The primary management objective is monitoring and maintaining the wild and self-sustaining populations of native fish species (MTFWP 2013). Special management concerns for this drainage are securing appropriate in-stream flow rights to protect fisheries during drought cycles, balancing diverse land and aquatic resource uses, and maintaining current fish passage (MTFWP 2013).

No surveys have been conducted in Sandstone Creek within the Project boundary. Surveys conducted downstream of the Project area have recorded fathead minnow and brook stickleback between Baker and the confluence with South Fork Sandstone Creek near Plevnia, Fallon County (MTFWP 2015a). Sandstone Creek is within the native range for brook stickleback, which has been introduced elsewhere in the state (MNHP and MTFWP 2018).

2.3 AQUATIC NUISANCE SPECIES

The State of Montana has listed several fish, plants, crustaceans, mollusks, mammals, parasites, and pathogens as aquatic nuisance species (Montana Aquatic Nuisance Species Technical Committee 2002). None of these species were observed during field surveys or are known to occur within the Project area (MTFWP 2015b; MNHP and MTFWP 2018).

2.4 AQUATIC INVERTEBRATES

Invertebrate communities that occur within the Project area include worms, immature and adult insects, snails, and other classes of invertebrates. The composition and abundance of the invertebrate community can vary depending on the physical characteristics of the waterbody, such as flow, substrate, presence of submerged vegetation, and other factors. Invertebrates serve important roles in the aquatic environment through their food web dynamics. They also represent important food sources for fish and are used as indicators of water quality conditions. It is assumed that invertebrates are present in all waterbodies that contain water seasonally or on a permanent basis. Recent invertebrate data for specific waterbodies within the Project area are not available. No BLM sensitive invertebrate species have the potential to occur in the Project area (see Section 5.2.4).

2.5 AMPHIBIANS AND TURTLES

Amphibians and turtles have the potential to occur within the Project area. Species that have been documented within the BLM Miles City Field Office (MCFO) include tiger salamander (*Ambystoma tigrinum*), Woodhouse's toad (*Bufo woodhousii*), great plains toad (*Bufo cognatus*), western chorus frog (*Pseudacris triseriata*), plains spadefoot (*Spea bombifrons*), northern leopard frog (*Rana pipiens*), snapping turtle (*Chelydra serpentina*), painted turtle (*Chrysemys picta*), and

spiny softshell (*Apalone spinifera*) (Werner et al. 2004). All of these species typically use flooded areas, wetlands, streams, and seasonally dry lakes in the spring and summer for breeding. Salamander and toad species overwinter in burrows and other moist areas in terrestrial habitat. These species migrate to aquatic habitat during the breeding period and return to terrestrial habitat in late summer or fall. Most frog species are associated with permanent wet areas. BLM sensitive amphibian species with the potential to occur in the Project area are the Great Plains toad and plains spadefoot, which are discussed in Section 5.2.1.

3.0 VEGETATION RESOURCES

The Project area is located within the Northwestern Great Plains U.S. Environmental Protection Agency Level III ecoregion. This ecoregion is a semiarid rolling plain of shale, siltstone, and sandstone punctuated by occasional buttes and badlands. Native grassland persists in areas of steep or broken topography. In Montana, this ecoregion is the major sustainer of livestock grazing with less than half of it converted to agriculture (NatureServe 2009). Vegetation and landcover types and community characterizations were compiled based on Natural Resources Conservation Service (NRCS) Ecological Site Descriptions (ESDs) (NRCS 2011) and those queried within the Landscape Fire and Resource Management Planning Tools Project (LANDFIRE) database in relation to the Project area (LANDFIRE 2015).

Vegetation resources presented within this section include general vegetation and landcover types within the Project area. Noxious weeds and invasive plants are addressed in detail in the Noxious Weed Management Plan developed for the Project (see Appendix F of the POD). Special status plant species are presented in Section 5.0, Special Status Species.

Due to the extensive characterization of the LANDFIRE dataset, the landcover types presented below are grouped into six general vegetation cover types. Distribution of vegetation types in these areas is strongly influenced by variations in landscape position, soil type, moisture, elevation, and aspect. Table 3-1 summarizes acreage of each landcover type within the Project disturbance area.

Table 3-1. Landcover Types within the Project Area

Landcover Type	Commonly Associated ESD(s)*	Acres†	Percentage
Agricultural	N/A	105.9	7.2
Conifer	N/A	16.0	1.1
Developed	N/A	113.5	7.7
Grassland	Clayey; Silty	828.2	56.0
Shrubland	Dense Clay; Saline Upland	396.4	26.8
Sparsely Vegetated	Shallow; Claypan	17.6	1.2
Total		1,477.6	100.0

* Landcover types with ESDs listed as N/A either do not have commonly associated ESDs or are due to anthropogenic influences.

† The sums of individual habitat acreages and percentages do not exactly match totals due to rounding error.

Source: LANDFIRE 2015

Descriptions of these regionally dominant vegetation cover types are provided in the following text. The individual plant species for each community category were derived from the NRCS ESDs, SWCA field surveys, and LANDFIRE by NatureServe (2009). An ecological site is a specific kind of land defined by its physical characteristic that differs from other communities within a landscape in its ability to produce and support a distinctive type and amount of vegetation, and in its ability to respond similarly to management actions and natural disturbances (NRCS 2011). Further site-specific vegetation descriptions can be found in the Greater Sage-Grouse Habitat Mitigation Plan, Appendix E of the POD. Species nomenclature is consistent with the NRCS Plants Database (2015).

3.1 AGRICULTURAL

Agricultural lands in the Project area were observed by the SWCA field teams to be predominantly hay fields. The hay fields are either alfalfa (*Medicago sativa*) or a mixture of cultivated grass species (e.g., crested wheatgrass [*Agropyron cristatum*], intermediate wheatgrass [*Thinopyrum intermedium*], and tall wheatgrass [*Thinopyrum ponticum*]) and alfalfa. Other common crops grown in the area include barley (*Hordeum vulgare*), spring wheat (*Triticum aestivum*), sugar beets (*Beta vulgaris*), safflower (*Carthamus tinctorius*), and canola (*Brassica* sp.). Hay fields are harvested one to multiple times per year. Noxious weeds in these fields are managed through crop rotation or chemical application (LANDFIRE 2015).

3.2 CONIFER

This cover type in the Northwestern Great Plains ecoregion generally refers to scattered ponderosa pine (*Pinus ponderosa*) woodland in areas of broken topography, particularly along escarpments, ravines, and breaklands, where individual trees may be widely spaced. However, these features are not present in the Project area. Instead, the conifer cover type within the Project area likely refers to planted shelterbelts and windbreaks of various, unspecified conifer species.

3.3 DEVELOPED

The developed land cover type consists of non-vegetated roads, previously developed areas, and existing pipeline and power line rights-of-way, regardless of post-construction reclamation efforts. Consequently, upland herbaceous and shrubland communities that have become established in previously developed areas also comprise this category (LANDFIRE 2015). Exotic species such as halogeton (*Halogeton glomeratus*), cheatgrass (*Bromus tectorum*), and black henbane (*Hyoscyamus niger*) are well adapted to invade disturbed areas within this system (LANDFIRE 2015).

3.4 GRASSLAND

The grassland vegetation cover type is composed primarily of mixed-grass prairie with small percentages of shrubs and forbs. The most common ESDs that comprise the grassland landcover type in the Project area include Clayey (Cy) and Silty (DC). Grassland species in the Project area include cool and warm season grasses including western wheatgrass (*Pascopyrum smithii*), bluebunch wheatgrass (*Pseudoroegneria spicata*), green needlegrass (*Nassella viridula*),

Sandberg's bluegrass (*Poa secunda*), prairie junegrass (*Koeleria macrantha*), and blue grama (*Bouteloua gracilis*) (SWCA 2015). Forbs, including prairie clovers (*Dalea* spp.), American vetch (*Vicia americana*), winterfat (*Krascheninnikovia lanata*), and scurfpeas (*Psoraleidium* spp.), and shrubs, including Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), silver sagebrush (*Artemisia cana*), and saltbrushes (*Atriplex* spp.), are present in small numbers. In addition, exotic species such as cheatgrass, Dalmatian toadflax (*Linaria dalmatica*), and thistles (*Cirsium* spp. and *Carduus nutans*) can invade these systems (LANDFIRE 2015; NatureServe 2009).

3.5 OPEN WATER/RIPARIAN

Although not comprising a significant portion of the landcover dataset, there are extensive open water/riparian areas in the Project area. The open water/riparian vegetation cover type is comprised of human-made reservoirs, floodplains, riparian areas, and herbaceous wetlands. Alluvial soils and periodic flooding (every 5 to 25 years) typify this system. The most common ESDs that comprise the riparian landcover type in the Project area include Subirrigated (Sb) and Saline Lowland (SL). Dominant species may include alkali grasses (*Puccinellia* spp., *Distichilis spicata*), silver sagebrush, slender wheatgrass (*Elymus trachycaulus*), willow (*Salix* spp.), cottonwood (*Populus deltoides*), and American elm (*Ulmus americana*) (SWCA 2015). In addition, exotic species such as salt cedar (*Tamarix* spp.) and Russian olive (*Elaeagnus angustifolia*) can invade these systems (LANDFIRE 2015; NatureServe 2009).

3.5.1 Wetland and Waterbodies Inventories

Wetlands and non-wetland waterbodies (streams and/or drainages with water flow) were surveyed within the entire Project boundary to determine if they had the potential to be a "Waters of the United States" (WOUS). All USFWS National Wetlands Inventory (NWI) polygons and U.S. Geological Survey National Hydrology Database (NHD) drainage flowlines intersecting the Project disturbance areas were investigated for potential wetlands and waterbodies, as well as water features identified by aerial imagery interpretation or during field surveys that were not identified as NWI or NHD features. All wetland and non-wetland waterbodies were mapped in the field using submeter-accurate handheld Trimble global positioning system (GPS) units.

A wetland is defined by the U.S. Army Corps of Engineers (USACE) by the presence of three attributes: hydrophytic vegetation, hydric soils, and wetland hydrology (USACE 1987). Wetland boundaries were delineated where all three fundamental characteristics of hydrophytic vegetation, hydric soils, and wetland hydrology were present.

At least one sample point was recorded in each NWI polygon located in the survey area to document presence or absence of wetland characteristics and other aquatic resources. Sample points were recorded in all suspected wetland areas identified during the desktop review and in areas displaying wetland characteristics during the field surveys.

Sample point data were collected according to the USACE Great Plains Regional Supplement (USACE 2010). Data recorded at each sample point included all vegetation within prescribed sampling plots, soil characteristics, and hydrology information. Overview photographs of the sample area and detailed photographs of vegetation, soils, and hydrology were taken at each

sample point. Sample points that exhibited positive indicators of hydrophytic vegetation, hydric soils, and wetland hydrology were classified as wetlands. Sample points that did not contain wetland indicators for all three criteria were classified as uplands. Wetlands that satisfy all three criteria may be subject to regulation by the USACE under the Clean Water Act.

Identification of plant species, percent cover of plant species, and their 2014 National Wetland Plant List-designated indicator status (Lichvar et al. 2014) dictated the presence of hydrophytic vegetation. To determine if hydric soils were present, a soil profile extracted to a depth of up to 20 inches was examined for the presence of hydric soil indicators. Inundation, saturation, and other physical indicators suggesting the presence of water were used to determine wetland hydrology at each sample point.

Non-wetland waterbodies were defined by the presence of ordinary high water marks (OHWMs) indicated by the presence of distinguishing physical characteristics such as a clear, natural line impressed on the bank; shelving; changes in the character of soil; the absence of terrestrial vegetation; the presence of litter and debris; or other appropriate means. The OHWM is a defining element for identifying the lateral limits of non-wetland waters and typically represents the outer limits of potential USACE jurisdiction (Lichvar and McColley 2008). Non-wetland waterbodies were delineated at the extent of the OHWM.

Streams and drainages were classified as perennial, intermittent, or ephemeral based on field observations of perceived flow regimes. A perennial stream features flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow; runoff from rainfall is a supplemental source of water for stream flow. An intermittent stream features flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not feature flowing water. Runoff from rainfall is a supplemental source of water for stream flow. An ephemeral stream features flowing water only during and shortly after precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

Wetlands and waterbodies that were delineated within the survey areas are listed in Attachment 3 to this resource report. Attachment 3 also includes the acreage of each wetland and waterbody, between the OHWM, within the Project boundaries. Impacted acreages will be calculated once the Project footprint has been developed.

3.6 SHRUBLAND

The shrubland vegetation cover type is primarily comprised of Wyoming big sagebrush shrubland communities. The most common ESDs that comprise the shrubland landcover type in the Project area include Dense Clay (DC) and Saline Upland (SU). In addition to Wyoming big sagebrush, common shrub species may include rubber rabbitbush (*Ericameria nauseosa*), yellow rabbitbush (*Chrysothamnus viscidiflorus*), antelope bitterbrush (*Purshia tridentata*), and saltbushes. Common native graminoid species can include Indian ricegrass (*Achnatherum hymenoides*), blue grama, thickspike wheatgrass (*Elymus lanceolatus*), needleandthread (*Hesperostipa*

comata), basin wildrye (*Leymus cinereus*), western wheatgrass, and Sandberg's bluegrass (*Poa secunda*) (LANDFIRE 2015; NatureServe 2009). In addition, exotic species such as halogeton and cheatgrass can invade these systems (LANDFIRE 2015).

3.7 SPARSELY VEGETATED

The sparsely vegetated cover type included various sparsely vegetated communities including cliff faces, narrow canyons, open tablelands, saline playas, eroded badlands, and active inland dunes. The most common ESDs that comprise the sparsely vegetated landcover type in the Project area include Shallow (Sw) and Claypan (Cp). Vegetation on these harsh sites is characterized by sparse cover of trees, shrubs, dwarf-shrubs, forbs, or grasses of various mixtures (LANDFIRE 2015).

4.0 WILDLIFE RESOURCES

Wildlife species that inhabit the Project area are typical of the arid shrublands and grasslands of southeastern Montana. The predominant wildlife habitat types occurring within the Project area include sagebrush shrubland, grassland, and cropland. Limited areas of riparian and wetland vegetation also provide important wildlife habitat within the EOR development boundary. Topographic relief varies from flat to rolling with occasional sections of steep terrain. Cliffs border some stretches of the Project area, particularly along the southern extent of the alignment. Detailed information about vegetative types crossed by the Project area is provided in Section 3.0, Vegetation Resources.

During field surveys, SWCA biologists observed several species, including white-tailed jackrabbit (*Lepus townsendii*), black-tailed prairie dog (*Cynomys ludovicianus*), pronghorn (*Antilocapra americana*), mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), red fox (*Vulpes vulpes*), coyote (*Canis latrans*), northern harrier (*Circus cyaneus*), red-tailed hawk (*Buteo jamaicensis*), gadwall (*Anas strepera*), western meadowlark (*Sturnella neglecta*), horned lark (*Eremophila alpestris*), and black-billed magpie (*Pica hudsonia*).

Detailed discussions are provided below for big game, waterfowl, upland game birds, and other game animals in the Project area. BLM sensitive wildlife species are discussed in detail in Section 5.2.

4.1 GAME SPECIES

4.1.1 Big Game

Big game species that occur within the Project area include pronghorn, mule deer, and white-tailed deer. Although elk (*Cervus canadensis*), big horn sheep (*Ovis canadensis*), mountain lion (*Puma concolor*), and black bear (*Ursus americanus*) occur within the BLM MCFO, their distributions do not overlap with the Project area (MTFWP 2015b).

The Project area contains approximately 1,094.82 acres of big game crucial winter range (Attachment 1) as identified by the BLM in coordination with the MTFWP (see map in Attachment 1). Big game crucial winter range is typically considered the most important and

limiting habitat for big game species, especially during harsh winters with extremely cold temperatures and above average snow depths.

4.1.1.1 Pronghorn

Pronghorn inhabit grassland, desert shrubland, and sagebrush shrubland in flat to rolling topography and browse on grasses, forbs, and shrubby plants, especially sagebrush, throughout the year. During the winter, pronghorn generally use areas of relatively high sagebrush densities and overall low snow accumulations, on south- and west-facing slopes. Pronghorn were observed by SWCA during field surveys in 2015 and habitat is present throughout the Project area (MTFWP 2015b; SWCA 2015).

4.1.1.2 Mule Deer

Mule deer are the most abundant big game species in the BLM MCFO, have habitat throughout the Project area, and were observed by SWCA during field surveys in 2015 (MTFWP 2015b; SWCA 2015). Mule deer use riparian, agricultural, shrubland, and conifer habitat. Riparian bottoms, agricultural areas, and forests are used either yearlong or seasonally. Areas of rough topography dominated by shrub species provide crucial browse and winter range. Breaks, badlands, and brushy draws are preferred in open prairie country (BLM 2015a).

4.1.1.3 White-tailed Deer

White-tailed deer prefer riparian drainage bottoms, wetland habitats, and dense forested areas. Suitable winter range includes areas with dense canopy classes, moist habitat types, uncut areas, and low snow depths (BLM 2015a). White-tailed deer do not migrate for long distances between summer and winter ranges. White-tailed deer were observed by SWCA during field surveys in 2015 and habitat is present within the Project area (MTFWP 2015b; SWCA 2015).

4.1.2 Waterfowl

Waterfowl species use ponds, reservoirs, and creeks in the Project area. The presence of open water near grassland habitats is important for waterfowl production in the BLM MCFO (BLM 2015a). Waterfowl presence within the Project area would be limited to streams, primarily Buffalo, Corral, Sandstone, and Waterhole Creeks, as well as ponds and wetlands. The availability of breeding habitat within the Project area is constrained by the linear nature of perennial streams and available suitable upland nesting habitat near ponds and reservoirs. Examples of common waterfowl in the region include ruddy duck (*Oxyura jamaicensis*), gadwall (*Anas strepera*), American wigeon (*A. americana*), mallard (*A. platyrhynchos*), blue-winged teal (*A. discors*), green-winged teal (*A. crecca*), and Canada goose (*Branta canadensis*). Gadwalls, mallards, and Canada geese were observed during field surveys.

4.1.3 Upland Game Birds

Upland game bird species known or likely to occur within the Project area include sharp-tailed grouse (*Tympanuchus phasianellus*), greater sage-grouse (*Centrocercus urophasianus*), wild turkey (*Meleagris gallopavo*), mourning dove (*Zenaida macroura*), ring-necked pheasant (*Phasianus colchicus*), and gray partridge (*Perdix perdix*). Greater sage-grouse is discussed further in Section 5.2.2, and sharp-tailed grouse are discussed in Section 5.3.2. Wild turkey is

likely to occur within areas of large roosting trees, such as cottonwoods (*Populus* sp.), along riparian corridors and near grain fields. Gray partridge is closely associated with sagebrush and riparian areas. Ring-necked pheasant is found in among shelterbelts in agricultural settings. Sharp-tailed grouse, greater sage-grouse, gray partridge, and mourning doves were observed during field surveys (SWCA 2015).

4.1.4 Other Game Animals

Other game animals that occur in the region around the Project area are the bobcat (*Lynx rufus*), coyote, red fox (*Vulpes vulpes*), and muskrat (*Ondatra zibethicus*) (MNHP and MTFWP 2018).

4.2 NONGAME SPECIES

Nongame species potentially occurring in the Project area encompass a large diversity of animal taxa. Important nongame species primarily include a number of mammals, raptors, songbirds, amphibians, and reptiles.

4.2.1 Mammals

Nongame mammal species that occur within the Project region include badger (*Taxidea taxus*), bushy-tailed woodrat (*Neotoma cinerea*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), red fox, deer mouse (*Peromyscus maniculatus*), desert cottontail (*Sylvilagus audubonii*), least chipmunk (*Tamias minimus*), long-eared myotis (*Myotis evotis*), long-legged myotis (*Myotis volans*), meadow vole (*Sorex merriami*), northern grasshopper mouse (*Onychomys leucogaster*), and porcupine (*Erethizon dorsatum*) (MNHP and MTFWP 2018). BLM sensitive mammal species with the potential for occurrence in the Project area include black-tailed prairie dog, swift fox (*Vulpes velox*), fringed myotis (*Myotis thysanodes*), and Townsend's big-eared bat (*Corynorhinus townsendii*) which are discussed in Section 5.2.5.

4.2.2 Raptors

Diurnal raptor species that could occur within the Project area are those associated with open grasslands. These species include, but may not be limited to, the bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), ferruginous hawk (*Buteo regalis*), Swainson's hawk (*B. swainsoni*), red-tailed hawk, rough-legged hawk (*B. lagopus*), American kestrel (*Falco sparverius*), burrowing owl (*Athene cunicularia*), peregrine falcon (*F. peregrinus*), prairie falcon (*F. mexicanus*), merlin (*F. columbarius*), northern harrier, burrowing owl (*Athene cunicularia*), great horned owl (*Bubo virginianus*), and short-eared owl (*Asio flammeus*) (MNHP and MTFWP 2018; SWCA 2015). BLM sensitive raptor species with potential for occurrence in the Project area are the bald eagle, golden eagle, ferruginous hawk, peregrine falcon, and burrowing owl, which are discussed in Section 5.2.2. During field surveys in 2015, prairie falcon, Swainson's hawk, red-tailed hawk, golden eagle, northern harrier, and burrowing owl were observed (SWCA 2015, 2016, 2017).

Aerial and ground surveys for raptor nests were conducted throughout the field development Project area and 1-mile buffer during 2015, 2016, and 2017. Landowner access was not available for areas outside of the Project area, so any ground-based nest surveys beyond the Project boundaries were conducted from public access roads.

The aerial nest surveys were conducted in 2015, 2016, and 2017, within the Project area and 1-mile buffer. The aerial survey was completed by two biologists and an experienced pilot from a Bell Turbine 206B3 helicopter. The survey area was covered using perpendicular north/south transects spaced 0.5 mile apart. Approximately 7 hours of flight time were spent surveying the field development area and 1-mile buffer. Surveys focused on known nest sites (MNHP 2015) and potential nesting habitat. Habitat types included cliff bands, rock outcrops and promenades, steep slopes, riparian zones and river corridors, and suitable human-made structures (e.g., power line poles).

In addition to the aerial surveys, ground-based surveys were conducted in 2015 from vehicles and on foot with the aid of binoculars and spotting scopes. Care was taken to avoid flushing any raptors by initiating nest searches from a distance and then approaching on foot for closer inspection if signs of a nest were present. Potential nest sites were examined from different angles to ensure complete coverage. The nest status, condition, location, and other site-specific information were recorded for all observed raptor nests.

Seven raptor nests have been identified for the Project area and 1-mile buffer (BLM 2018; MNHP 2015; SWCA 2015, 2016, 2017). Nests are listed in Table 4-1 and their locations illustrated in Figure A-5. Raptor nest surveys were conducted during 2015, 2016, and 2017 to monitor known nest activity as well as to identify potential new nest locations.

Table 4-1. Raptor Nests Identified within the Project Area and 1-Mile Buffer

Nest ID*	Species	Substrate	Latitude [†]	Longitude	Township, Range, Section
745887	Red-tailed hawk	Tree	46.329150	-104.059300	T7N, R61E, Sec 27
R6AFA008	Ferruginous hawk	Rock outcrop	46.252054	-104.211702	T6N, R60E, Sec 28
R6AFA009	Ferruginous hawk	Rock outcrop	46.407147	-104.149750	T8N, R61E, Sec 36
R6AFA010	Ferruginous hawk	Rock outcrop	46.406404	-104.148250	T8N, R61E, Sec 36
R8AFA001	Unknown	Tree	46.356056	-104.190556	T7N, R60E, Sec 15
R9BFA001	Unknown	Tree	46.337019	-104.084824	T7N, R61E, Sec 28
R20BFA001	Ferruginous hawk	Rock outcrop	46.252236	-104.207316	T6N, R60E, Sec 21

* Nest 745887 was found to be active during 2017 surveys; all other nests were inactive in 2017.

[†] Ferruginous hawk nest coordinates were taken from helicopter and are approximate. Due to terrain features or lack of landowner access permission, nesting locations were not surveyed from the ground.

Sources: BLM 2018; MNHP 2015; SWCA 2015, 2016, 2017

4.2.3 Other Migratory Birds

Common wading and shorebird species that are known or likely to occur within the Project area include great blue heron (*Ardea herodias*), long-billed curlew (*Numenius americanus*), upland sandpiper (*Bartramia longicauda*), spotted sandpiper (*Actitis macularius*), American avocet (*Recurvirostra americana*), and Wilson's snipe (*Gallinago delicata*) (MNHP and MTFWP 2018). Great blue heron, upland sandpiper, and American avocet were detected during 2015 surveys. BLM sensitive bird species are discussed in Section 5.2.2.

An aerial survey for potential wading bird rookery habitat was conducted on August 7, 2015 (see Section 4.2.2 for aerial survey details). Potential habitat in the form of mature trees within riparian

corridors was marked using a GPS unit during the aerial survey. These sites were visited during ground surveys to examine each site for nests and to delineate the area for further evaluation and/or mitigation. Three sites were delineated as potential wading bird rookery sites at dammed sections of Buffalo Creek, Waterhold Creek, and a tributary to Waterhole Creek (Figure A-6). No heronries were found during ground surveys in 2015.

Common passerine species known or likely to occur within the Project area include American crow (*Corvus brachyrhynchus*), mountain bluebird (*Sialia currucoides*), field sparrow (*Spizella pusilla*), lark sparrow (*Chondestes grammacus*), and red-winged blackbird (*Agelaius phoeniceus*) (MNHP and MTFWP 2018). BLM Sensitive passerine bird species that may occur in the area include loggerhead shrike (*Lanius ludovicianus*), chestnut-collared longspur (*Calcarius ornatus*), sage thrasher (*Oreoscoptes montanus*), and Brewer's sparrow (*Spizella breweri*), which are discussed in Section 5.2.2.

4.2.4 Reptiles

Reptile species that have been documented within the BLM MCFO include western hog-nosed snake (*Heterodon nasicus*), milksnake (*Lampropeltis triangulum*), plains gartersnake (*Thamnophis radix*), common gartersnake (*Thamnophis sirtalis*), terrestrial gartersnake (*Thamnophis elegans*), eastern racer (*Coluber constrictor*), gophersnake (*Pituophis catenifer*), smooth green snake (*Opheodrys vernalis*), prairie rattlesnake (*Crotalus viridis*), greater short-horned lizard (*Phrynosoma hernandesi*), northern leopard frog (*Lithobates pipiens*; *Rana pipiens*), and common sagebrush lizard (*Sceloporus graciosus*) (BLM 2015a). BLM sensitive reptile species with the potential to occur in the Project area are snapping turtle, western hog-nosed snake, milksnake, and greater short-horned lizard, which are discussed further in Section 5.2.6.

5.0 SPECIAL STATUS SPECIES

Special status species are those species for which federal or state agencies afford an additional level of protection by law, regulation, or policy. Included in this category are federally listed species that are protected under the Endangered Species Act of 1973 (16 United States Code ch. 35 § 1531 et seq) (ESA), species protected on BLM lands as Sensitive Species under the BLM Manual 6840: Special Status Species Management, and other species with specific guidelines in the BLM MCFO Resource Management Plan (RMP) that are not addressed elsewhere (BLM 2015b). Listed threatened or endangered species, and their critical habitat, are designated by the USFWS. BLM Sensitive Species are designated by BLM State Directors. There are 3 species listed under the ESA (USFWS 2018) and 43 species designated as BLM Sensitive Species (BLM 2014) in the jurisdictional area in which the Project is located. Also included is a discussion on black-footed ferrets (*Mustela nigripes*) and sharp-tailed grouse (Section 5.3).

5.1 USFWS LISTED SPECIES

The USFWS identifies one listed endangered species and two listed threatened species with potential for occurrence in Fallon County, Montana (Table 5-1).

Table 5-1. USFWS Listed and Candidate Species for Fallon County

Common Name	Scientific Name	Status
Whooping crane	<i>Grus americana</i>	Listed Endangered
Northern long-eared bat	<i>Myotis septentrionalis</i>	Listed Threatened
Piping plover	<i>Charadrius melodus</i>	Listed Threatened

Source: USFWS 2018

The whooping crane (*Grus americana*) is not known to nest in Montana and is likely to occur only as a transitory migrant through the Project area at reservoirs, lakes, and ponds. There is one historic sighting for whooping crane in Fallon County (MNHP and MTFWP 2018) and just six for Montana from 2003 to 2011 (Montana Bird Distribution Committee 2012). Based on the lack of recent records for Fallon County and very few for the entire state, it is unlikely that this species would occur in the Project area.

The piping plover (*Charadrius melodus*) primarily breeds in Nebraska, North Dakota, Montana, and South Dakota; four south-central Canadian provinces; as well as in much smaller numbers in Colorado, Iowa, Kansas, and Minnesota. Its winter range extends along the Gulf of Mexico from Texas to Florida. The species arrives on its breeding grounds in the first half of April and begins to leave its nesting grounds as early as mid-July (USFWS 2016). Fallon County is within the migratory, but not the breeding, range for this species in Montana (MNHP and MTFWP 2018). The only piping plover occurrence recorded in or near the Project area was at Lake Baker, Fallon County, in May 2011 (MNHP and MTFWP 2018). Lake Baker is in the town of Baker adjacent to the Cedar Creek Anticline Oil Field. There is no designated critical habitat in Fallon County (USFWS 2018).

The northern long-eared bat (*Myotis septentrionalis*) may have potential habitat along wooded riparian corridors in the Project area, however the closest known hibernacula is more than 100 miles away from the Project site. There is little to no potential for this species to occur in the Project area. This species is referred to on the Montana/Dakotas BLM sensitive species list (BLM 2014) as northern myotis. A habitat assessment conducted for this species is included in the *Northern Long-eared Bat Habitat Assessment Addendum* to this report (see Attachment 5).

5.2 BLM SENSITIVE SPECIES

Sensitive species for the Project area were identified using the Montana/Dakotas BLM Sensitive Species list (BLM 2014), as provided to SWCA by the BLM MCFO. A review of available published literature, available agency GIS files, and agency online resources was completed to determine the species potential for occurrence in the Project area. The potential occurrence determination was based on habitat requirements, known distribution, and occurrence records. Table 5-2 identifies which of those species have potential for occurrence or to be impacted by the Project; these species are further discussed in the following subsections. Those species with no potential for occurrence in the Project area or for being impacted by the proposed action were excluded from further discussion; the table in Attachment 2 outlines the reasoning behind their exclusion.

Table 5-2. BLM Sensitive Species

Common Name	Scientific Name	Further Discussion
Amphibians		
Great Plains toad	<i>Anaxyrus cognatus</i>	Yes
Plains spadefoot	<i>Spea bombifrons</i>	Yes
Birds		
American bittern	<i>Botaurus lentiginosus</i>	No
Baird's sparrow	<i>Ammodramus bairdii</i>	Yes
Bald eagle	<i>Haliaeetus leucocephalus</i>	Yes
Black tern	<i>Chilodoniass niger</i>	No
Black-backed woodpecker	<i>Picoides arcticus</i>	No
Brewer's sparrow	<i>Spizella breweri</i>	Yes
Burrowing owl	<i>Athene cunicularia</i>	Yes
Caspian tern	<i>Hydroprogne caspia</i>	No
Chestnut-collared longspur	<i>Calcarius ornatus</i>	Yes
Common tern	<i>Sterna hirundo</i>	No
Ferruginous hawk	<i>Buteo regalis</i>	Yes
Franklin's gull	<i>Leucophocus pipixcan</i>	No
Golden eagle	<i>Aquila chrysaetos</i>	Yes
Greater sage-grouse	<i>Centrocercus urophasianus</i>	Yes
Loggerhead shrike	<i>Lanius ludovicianus</i>	Yes
Long-billed curlew	<i>Numenius americanus</i>	Yes
McCown's longspur	<i>Rhychophanes mccownii</i>	No
Mountain plover	<i>Charadrius montanus</i>	Yes
Peregrine falcon	<i>Falco peregrinus</i>	No
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	Yes
Red knot	<i>Calidris cantus</i>	No
Sage thrasher	<i>Oreoscoptes montanus</i>	Yes
Sprague's pipit	<i>Anthus spragueii</i>	Yes
Veery	<i>Catharus fuscescens</i>	No
White-faced ibis	<i>Plegadis chihi</i>	No
Fish		
Iowa darter	<i>Etheostoma exile</i>	No
Paddlefish	<i>Polyodon spathula</i>	No
Sauger	<i>Sander canadensis</i>	No
Sturgeon chub	<i>Macrhybopsis gelida</i>	No
Invertebrates		
A mayfly	<i>Raptoheptagenia cruentata</i>	No
Mammals		
Black-tailed prairie dog	<i>Cynomys ludovicianus</i>	Yes
Fringed myotis	<i>Myotis thysanodes</i>	Yes
Pallid bat	<i>Antrozous pallidus</i>	No
Spotted bat	<i>Euderma maculatum</i>	No
Swift fox	<i>Vulpes velox</i>	Yes
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	Yes

Common Name	Scientific Name	Further Discussion
Reptiles		
Greater short-horned lizard	<i>Phrynosoma hernandesi</i>	Yes
Milksnake	<i>Lampropeltis triangulum</i>	Yes
Snapping turtle	<i>Chelydra serpentina</i>	Yes
Spiny softshell	<i>Apalone spinifera</i>	No
Western hog-nosed snake	<i>Heterodon nasicus</i>	Yes

SWCA conducted surveys for the following BLM sensitive species or their habitats in 2015.

- Black-tailed prairie dog colonies
- Raptor nests
- Potential eagle roost site habitat
- Potential wading bird rookery habitat
- Potential mountain plover (*Charadrius montanus*) habitat
- Burrowing owl habitat
- Sensitive plant species with the potential to occur in the Project area

The survey protocols followed the *Wildlife Survey Protocol for the Miles City Field Office (MCFO) Bureau of Land Management* (BLM 2013). The surveys are further described in the individual species sections. In addition, the field teams recorded any incidental observations of other species on the sensitive species list.

5.2.1 BLM Sensitive Amphibian Species

Two BLM sensitive amphibian species have the potential to occur within the Project area.

5.2.1.1 Great Plains Toad

The Great Plains toad is found in eastern Montana in higher elevation grassland habitats, agricultural areas, open ponderosa pine forests and savannahs (Hendricks 1999; Werner et al. 2004). Breeding occurs in glacial ponds, stock reservoirs, irrigation ditches, and smaller coulees (Werner et al. 2004). No Great Plains toads have been observed in the Project area (MTFWP 2015b) and the species has not been recorded in Fallon County although it has been recorded in neighboring counties (MNHP and MTFWP 2018). Based on the presence of suitable habitat within the Project area and known occurrences in neighboring counties, the potential for occurrence in the Project area is considered low.

5.2.1.2 Plains Spadefoot

The plains spadefoot are found in grassland and sagebrush areas, particularly in areas with sandy or loose soil (Hendricks 1999; Werner et al. 2004). It is only found near a water source, usually temporary in nature, during the breeding season, particularly shallow temporary pools following heavy spring or summer rainstorms (Hendricks 1999; Werner et al. 2004). Plains spadefoot has not been documented in the Project area or within Fallon County (MNHP and MTFWP 2018).

However, habitat is available for the plains spadefoot within sandy and loose soils habitats within the Project area and its potential to occur is considered low.

5.2.2 BLM Sensitive Bird Species

Fourteen BLM sensitive bird species have the potential to occur in the Project area.

5.2.2.1 Baird's Sparrow

The Baird's sparrow is an abundant to common nesting species in northeastern Montana (Montana Bird Distribution Committee 2012; MNHP and MTFWP 2018). The species prefers native prairie, but habitat structure complexity may be more important than composition since the species is found at sites with little to no grazing activity. MNHP and MTFWP (2018) have two recently documented occurrences of nesting from 2008 and one from 1992 in the Project area.

5.2.2.2 Bald Eagle

The bald eagle is primarily a forested riparian species in Montana, although it will use upland habitats during the winter season. The species is found near large waterbodies, especially those with sufficient fish and waterfowl for prey; year-round and ungulate winter ranges are an additional important characteristic of winter habitats. The species generally nests in large-diameter trees near large lakes and rivers where food is readily available and human disturbance is minimal (MNHP and MTFWP 2018). No bald eagle nests are known for the Project area or 1-mile buffer.

Bald eagles migrate from breeding areas between September and December and generally winter as far north as open water and food are available. Wintering bald eagles may gather in large aggregations and share communal roosts, diurnal perches, and feeding areas (Grubb and Kennedy 1982). Food availability and suitable perches are probably the most important factors influencing winter eagle distribution and abundance (Steenhof 1978). The species will gather at communal winter night roost sites. No winter night roost sites are known for the Project area or 1-mile buffer (MTFWP 2015b), but potential habitat, corresponding with potential wading bird rookery habitat, was mapped during aerial surveys on August 7, 2015 (Figure A-6). Aerial winter roost site surveys are planned for the 2015–2016 winter following survey protocol in BLM (2013).

During field surveys, no bald eagles or nests were observed. Because few potentially suitable nesting or roosting habitat is present within the Project area or 1-mile buffer, the probability of bald eagles occurring within the Project area during construction activities would be low and may consist only of flying individuals moving between suitable habitats.

5.2.2.3 Brewer's Sparrow

The Brewer's sparrow breeds in and is closely associated with sagebrush communities with densities positively correlated with total shrub cover. As a migrant, this species can be found in a wide variety of grassland and shrubland habitats. Sagebrush occurs sparsely in the Project area and there are multiple breeding confirmations in the southern portion of the Project area near Buffalo Creek (MTFWP 2015b). This species is expected as a breeding species in areas of sagebrush in the Project area.

5.2.2.4 Burrowing Owl

The burrowing owl is found throughout Montana in open grasslands with low vegetation height and where burrowing mammals, especially prairie dogs, are present. Despite its name the burrowing owl does not burrow but relies on abandoned burrows for nest and roost sites. Presence of prairie dog colonies is a prime indicator of potential burrowing owl occupancy since prairie dogs closely crop herbaceous vegetation within the colony, as well as provide a source of burrows. Incidental observations of burrowing owls on prairie dog colonies in the Project area were recorded during the 2015 surveys. No nests were observed.

5.2.2.5 Chestnut-collared Longspur

Chestnut-collared longspur is a summer resident in Montana. Its preferred breeding habitat is disturbed native short- to mixed-grass prairie. Historically, this would have been limited to sites recently disturbed by bison or fire. Today, the species prefers native prairie that has been recently grazed by cattle, mowed, or burned, but will nest in other mowed areas (e.g., near airstrips) and prefers taller and denser vegetation than McCown's longspur (Sedgwick 2004). There are three reported occurrences of nesting in 2008 and 2011 for the Project area (MTFWP 2015b).

5.2.2.6 Ferruginous Hawk

Ferruginous hawk is a summer resident in eastern Montana. Its preferred breeding habitat is mixed-grass prairie, shrub-grasslands, grasslands, grass-sagebrush complex, and sagebrush steppe. It primarily nests in ground nests and on rock outcrops. It does not appear to nest in areas converted to agriculture (MNHP and MTFWP 2018).

During 2015 field surveys, ferruginous hawks were observed in the Project area and three nests were recorded. Since surveys were conducted after the nest survey period (April 15–June 15; BLM 2013), nest occupancy status was not determined. Nest survey details are described in Section 4.2.2.

5.2.2.7 Golden Eagle

Golden eagles primarily nest on cliffs, buttes, in large trees, in the mountains, as well as open country, where nest sites allow for protection from mammalian predators and afford a view of the surrounding landscape. Golden eagles prey on a variety of terrestrial animals, including prairie dogs and grouse. No nest sites are known for the Project area or 1-mile buffer, but multiple nest sites are known approximately 30 miles south (MTFWP 2015b). Due to the proximity of known nest sites and prey availability, particularly prairie dog colonies and grouse leks, in the Project area, the potential occurrence for this species within the Project area is moderate.

5.2.2.8 Greater Sage-grouse

Seven leks are within the Project area and another 20 leks are present within 3.1 miles of the Project boundary (Table 5-3). The majority of these leks occur in the south and southwestern portions of the Project area and 3.1-mile buffer (see maps in Attachment 1). More detail is provided for this species in the Greater Sage-Grouse Habitat Mitigation Plan developed for this Project (see Appendix E of the POD). Aerial surveys for winter concentration areas were completed during the 2015–2016 winter following BLM (2013) survey protocol. No sage-grouse

winter concentration areas were identified during aerial surveys (SWCA 2015). Lek surveys or counts are conducted annually by another consultant hired by Denbury.

Approximately 17,730 acres of Restoration Habitat Management Area (RHMA) overlaps with the Project boundary (BLM 2015a). RHMA overlaps with the southwestern portion of the Project south of Highway 12. Its eastern boundary generally follows within 0.25 to 1.50 miles northeast of Corral Creek as that stream flows southeasterly through the Project area (see map in Attachment 1).

Table 5-3. Greater Sage-grouse Leks within the Project Area and 3.1-Mile Buffer

Lek ID	Last Year Surveyed	BLM Status*	Latitude	Longitude	Township, Range, Section
FA-006	2017	CA	46.266400	-104.124000	T6N, R61E, Sec 19
FA-007	2017	CI	46.265200	-104.096000	T6N, R61E, Sec 20
FA-008	2016	UC	46.265200	-104.106000	T6N, R61E, Sec 20
FA-009	2017	CI	46.265200	-104.112000	T6N, R61E, Sec 20
FA-010	2017	UC	46.258000	-104.080000	T6N, R61E, Sec 21
FA-011	2017	CA	46.258	-104.051	T6N, R61E, Sec 23
FA-012	2017	CI	46.2435	-104.049	T6N, R61E, Sec 26
FA-013	2017	CA	46.241100	-104.081800	T6N, R61E, Sec 28
FA-014	2017	CA	46.2326	-104.122	T6N, R61E, Sec 31
FA-014B	2013	CA	46.23297	-104.08617	T6N, R61E, Sec 33
FA-014C	2017	CA	46.23297	-104.08617	T6N, R61E, Sec 33
FA-015	2017	CA	46.3755	-104.062	T7N, R61E, Sec 10
FA-015A	2011	CA	46.3756	-104.062	T7N, R61E, Sec 10
FA-019	2017	CA	46.288700	-104.125000	T6N, R61E, Sec 7
FA-035	2016	CI	46.252500	-104.119000	T6N, R61E, Sec 19
FA-053	2017	CE	46.279900	-104.163300	T6N, R60E, Sec 14
FA-054	2017	CA	46.284500	-104.115900	T6N, R61E, Sec 7
FA-057	2017	CA	46.296800	-104.168500	T6N, R60E, Sec 7
FA-058	2017	CA	46.319000	-104.226700	T7N, R60E, Sec 32
FA-059	2017	CA	46.257600	-104.187000	T6N, R60E, Sec 22
FA-062	2017	CI	46.227	-104.0774	T6N, R61E, Sec 33
FA-067	2017	CA	46.292630	-104.215000	T6N, R60E, Sec 9
FA-069	2017	CA	46.400403	-104.261622	T8N, R60E, Sec 31
FA-070	2013	CA	46.418760	-104.316988	T8N, R59E, Sec 26
FA-Unk12	2017	UC	46.279321	-104.170228	T6N, R60E, Sec 14
FA-Unk14	2017	UC	46.26237	-104.0753	T6N, R61E, Sec 21
FA-Unk16	2017	UC	46.248225	-104.170228	T6N, R60E, Sec 26

*BLM Status: CA = Confirmed Active, CI = Confirmed Inactive, CE = Confirmed Extirpated, UC = Unconfirmed
Source: MTFWP 2018

5.2.2.9 Loggerhead Shrike

The loggerhead shrike is a summer resident in the region. This species lives in open country with patches of trees and shrubs present. Potential nesting habitat is limited within the Project area due

to a paucity of large shrubs and small trees. Based on habitat associations, its potential occurrence as a breeding species within the Project area is considered low.

5.2.2.10 Long-billed Curlew

The long-billed curlew is a native prairie species preferring shortgrass and mixed-grass prairie with flat to rolling topography. The species generally avoids habitats with trees, dense shrub cover, or tall dense grass. Its habitat preferences are more ubiquitous during migration when it can be found using agricultural croplands, reservoir edges, and shallow wetlands (Sedgwick 2006). Based on habitat associations, its potential occurrence as a breeding species within the Project area is considered low.

5.2.2.11 Mountain Plover

The mountain plover breeds in short-grass prairie, shrub-steppe landscape, dryland cultivated farms, and sparsely vegetated prairie dog towns (USFWS 2002). It prefers areas with extremely short, sparse grass and a large proportion of bare ground. Prairie dog towns within the Project area (see Section 5.2.5.1 and map in Attachment 1) potentially could be suitable breeding habitat for this species. SWCA also assessed areas with little to no vegetation and low topology as potential mountain plover habitat. None of the non-prairie dog town areas were considered suitable habitat due to limited size or hydrology (e.g., alkaline soils). No mountain plovers were observed during surveys in 2015.

5.2.2.12 Red-headed Woodpecker

The red-headed woodpecker is a summer resident of riparian forest and open ponderosa pine savanna of eastern Montana. Wooded riparian corridors may provide suitable habitat for this species in the Project area. However, there are no known occurrences in the Project area and very few in Fallon County. The potential for occurrence as a breeding species within the Project area is considered low.

5.2.2.13 Sage Thrasher

The sage thrasher breeds in sagebrush-dominated habitats. Its abundance in sagebrush habitats is positively correlated with sagebrush cover, but negatively correlated with grass cover. It is less habitat-specific during migration when it may be found in a variety of shrubby habitats and grasslands (MNHP and MTFWP 2018). No observations have occurred in the general Project area; however, the species likely breeds in suitable habitat in the region. The Project is on the northern extent of this species breeding range in North America. Since the Project area contains sagebrush habitat, particularly in the southern portion near Buffalo Creek, but is on the periphery of the species' breeding range, the potential for occurrence within the Project area is considered low.

5.2.2.14 Sprague's Pipit

Sprague's pipit breeds in the upper Great Plains region, primarily North Dakota, north-central South Dakota, eastern Montana, northwestern Minnesota, and southern portions of adjacent Canadian provinces. Sprague's pipit is strongly tied to native, unplowed prairie throughout its life cycle. The species is rarely observed in cropland or land in the Conservation Reserve Program, the latter presumably because the vegetation structure is too dense but will use nonnative

grassland when the vegetative structure is suitable. Vegetative structure appears to be a better predictor of potential occurrence than plant species composition. Sprague's pipits prefer sites with grass height ≤ 10 centimeters, sparse to intermediate vegetation density, and little to no litter or shrubs (Dechant et al. 2001). Indirect evidence of breeding is known at a few sites in Fallon County.

5.2.3 BLM Sensitive Fish Species

None of the BLM sensitive fish species are known or expected to occur within the Project area due to identified range restrictions or lack of suitable habitat.

5.2.4 BLM Sensitive Invertebrate Species

No BLM sensitive invertebrate species are expected to occur within the Project area due to identified range restrictions or lack of suitable habitat.

5.2.5 BLM Sensitive Mammal Species

Four BLM sensitive mammal species have the potential to occur in the Project area.

5.2.5.1 Black-tailed Prairie Dog

The black-tailed prairie dog inhabits shortgrass prairie and mixed grasslands that contain suitable upland soil types for constructing extensive burrow systems. The most frequently occupied habitat in Montana is dominated by western wheatgrass, blue grama, and big sagebrush (MNHP and MTFWP 2018). Black-tailed prairie dogs create unique habitat for a variety of prairie wildlife species.

Aerial and ground surveys were completed in 2015 for prairie dog colonies. Sites identified during aerial surveys were then subject to ground surveys to delineate colony boundaries and collect site-specific information. Ground surveys were conducted on foot or in vehicles with the aid of binoculars. New colonies were delineated with a submeter-accurate Trimble GPS unit. New colony perimeters were mapped by recording points at the outermost burrows around the colony edge. Activity status, burrow density, and other site-specific information were recorded for each colony. Six colonies were identified during those surveys.

The location and size of the six prairie dog colonies within the Project area and 0.5-mile buffer are listed in Table 5-4, and shown on the map in Attachment 1. Field data forms are provided in Attachment 4.

Table 5-4. Black-tailed Prairie Dog Colonies Delineated within the Project Area and 0.5-Mile Buffer

ID	Status	Size (acres)	Township, Range, Section	Comments
PD2BFA001	Active	42.9	T6N, R61E, Sec 3	None
PD4BFA001	Active	4.6	T7N, R60E, Sec 22	1 acre of active burrows
PD5AFA001	Active	16.4	T7N, R60E, Sec 25	One burrowing owl observed
PD8AFA001	Active	32.4	T7N, R61E, Sec 27	Outside Project area but within 0.5-mile buffer; adjacent to existing well pad; new pipeline scar running through colony
PD8AFA002	Active	79.5	T6N, R61E, Sec 4, 5, and 9	Two burrowing owls observed
PD9AFA001	Active	1.8	T8N, R60E, Sec 35 and 36	None

5.2.5.2 Fringed Myotis

The fringed myotis is found primarily in desert shrublands, sagebrush-grassland, and woodland habitats (MNHP and MTFWP 2018). This species only occurs in Montana during the summer months, June through September. Southeastern Montana is on the northeastern periphery of this species North American range. There are no records for Fallon County, but there are a few for neighboring counties to the west and south (MNHP and MTFWP 2018).

5.2.5.3 Swift Fox

This species was thought to be extirpated from Montana by 1969, but appears to be re-occupying north-central and northeastern Montana from Canada (BLM 2015a). Competition and predation by coyote and red fox appear to be the primary threats to this species (BLM 2015a). There is one recent record of this species in Fallon County approximately 23 miles west of the Project area. The presence of coyotes and red foxes, and the largely fragmented prairie habitat and land conversion, likely reduces the probability that swift fox would establish a long-term presence in the Project area.

5.2.5.4 Townsend's Big-eared Bat

The Townsend's big-eared bat inhabits dry coniferous forests, juniper woodlands, deciduous forests, basins, desert shrublands, and grasslands. Roost sites typically include caves and abandoned mines, but rock outcrops and buildings may also be used. Rock outcrops with cave-like structures suitable for roosts or hibernacula are rare and unlikely to be present in the Project area; however, ranch buildings are scattered throughout the Project area and the likelihood of occurrence for this species is low. No records are known for Fallon County (MNHP and MTFWP 2018).

5.2.6 BLM Sensitive Reptile Species

Four BLM sensitive reptile species were determined to have potential to exist within the Project area and are described in further detail below.

5.2.6.1 Greater Short-horned Lizard

The greater short-horned lizard is found in loose and sandy soils within a variety of habitats, including shortgrass prairie and sagebrush, especially along south-facing slopes, rocky rims of coulees, and shale outcrops (Werner et al. 2004). Greater short-horned lizards have not been documented in the Project area and there is only one recorded occurrence in Fallon County near the town of Colgate (MNHP and MTFWP 2018). However, habitat is available throughout the Project area for this species.

5.2.6.2 Milksnake

Milksnake can occur within a wide range of habitats including open sage-brush grassland habitat and margins of agricultural land, as well as within city limits (Werner et al. 2004). Milksnakes are commonly found near cliffs, talus, outcrops, and rocky hillsides (Hendricks 1999). Milksnakes have not been recorded in the Project area or Fallon County (MNHP and MTFWP 2018). Suitable habitat is available within the Project area in areas of sandy soil.

5.2.6.3 Snapping Turtle

Snapping turtles are found in large rivers, lakes, ponds, marshes, and in smaller sandy or muddy bottom streams with permanent flowing water (Hendricks 1999; Werner et al. 2004). Snapping turtles prefer habitats with a soft mud or sand bottom substrate with plentiful aquatic vegetation or debris (Hendricks 1999). Snapping turtles have been observed in South Sandstone Reservoir in Fallon County, but outside the Project area (MNHP and MTFWP 2018). Habitat for the snapping turtle is present within the Project area in perennial creeks, reservoirs, lakes, and ponds.

5.2.6.4 Western Hog-nosed Snake

The western hog-nosed snake occupies areas of well-drained gravelly or sandy, loose soil, often occurring near exposed rock outcrops, riverbanks, and old river beds (Werner et al. 2004). The western hog-nosed snake is widespread in eastern Montana but is not very abundant (Hendricks 1999). The species is known to occur in Fallon County (MNHP and MTFWP 2018) and habitat for this species is available within the Project area.

5.3 OTHER BLM RMP SPECIES

This section includes species that have RMP-specific guidelines but are not otherwise addressed in other sections of this report.

5.3.1 Black-footed Ferret

There are no known naturally occurring black-footed ferrets in the BLM MCFO planning area (BLM 2015a). Historic occurrences are known near the Project area (MTFWP 2015b; MNHP 2015; MNHP and MTFWP 2018). Black-footed ferrets are intimately tied to prairie dogs throughout their range and have only been found in association with prairie dogs. They are therefore limited to the same open habitat used by prairie dogs: grasslands, steppe, and shrub steppe. Black-footed ferrets do not dig their own burrows and rely on abandoned prairie dog burrows for shelter (MNHP and MTFWP 2018).

SWCA conducted aerial and ground surveys for black-tailed prairie dog colonies in the Project area and a 0.5-mile buffer (see Section 5.2.5.1). The survey plan was set up prior to the completion of the BLM MCFO RMP. Prior to the current RMP (BLM 2015b), the *USFWS Black-footed Ferret Survey Guidelines for Compliance with the Endangered Species Act* (USFWS 1989) were used to determine if surveys were required. The USFWS (1989) guidelines required surveys for any black-tailed prairie dog colonies individually, or as a complex (colonies less than 4.34 miles in distance from one another), greater than 80 acres. No single prairie dog colony was over 80 acres, however six colonies were within the requisite distance from one another to constitute a complex that totaled more than 80 acres, thereby requiring black-footed ferret surveys, per USFWS guidance (USFWS 1989). No colonies or complexes of greater than 1,500 acres, as outlined in the RMP (2015), were identified.

After consultation with the BLM (personal communication, telephone conversation between Kent Undlin, BLM Biologist, and Jake Powell, SWCA Biologist, on August 23, 2016), only three of the towns in the complex were surveyed for black-footed ferrets: PD5AFA001, PD2BFA001, and PD8AFA001. The surveys were conducted from September 12 to 17, 2016, following Method 2 in the USFWS black-footed ferret survey guidelines. PD5AFA001 was surveyed separately from PD8AFA001 and PD2BFA001, which were surveyed during the same night due to their proximity. The surveys were conducted by a team of two SWCA biologists, including one small mammal specialist familiar with black-footed ferrets. Weather conditions were acceptable for surveys throughout the survey period. The surveys, along with maps of the survey area, are detailed in Attachment 5. No black-footed ferrets were observed and no signs of black-footed ferrets were identified during the surveys of black-tailed prairie dog towns PD5AFA001, PD8AFA001, and PD2BFA001.

In addition to the area surveyed by SWCA, a BLM spatial layer (BLM 2018) of prairie dog colonies was reviewed to determine if there were a complex that met black-footed ferret habitat requirements (prairie dog colonies within 1.5 kilometers of each other comprising a total of at least 1,500 acres), as outlined by the BLM MCFO RMP (2015b).

There is no potential black-footed ferret habitat within the Project area, as defined by the MCFO RMP (2015b).

5.3.2 Sharp-tailed Grouse

Sharp-tailed grouse occur in grasslands interspersed with shrub- and brush-filled coulees. They prefer stands of inter-mixed tree and shrub grasslands. With high populations, they spread into islands of native grassland, usually along drainages surrounded by grain fields. Sharp-tailed grouse persist only on native bunchgrass-shrub stands (MNHP and MTFWP 2018).

Six leks are within the Project area and another seven are within 2 miles of the Project boundary. Locations of these leks are provided in Table 5-5 and illustrated in Figure A-4. Lek surveys or counts are conducted annually by another consultant hired by Denbury.

Table 5-5. Sharp-tailed Grouse Leks within the Project Area and 2-Mile Buffer

Lek ID	Last Year Surveyed	BLM Status*	Latitude	Longitude	Township, Range, Section
FA-019	2017	UC	46.312248	-104.101051	T7N, R61E, Sec 32
FA-020	2017	UC	46.277901	-104.049759	T6N, R61E, Sec 14
FA-025	2017	CA	46.239731	-104.184685	T6N, R60E, Sec 27
FA-026	2017	CA	46.362891	-104.161847	T7N, R60E, Sec 14
FA-027	2017	CA	46.288602	-104.105939	T6N, R61E, Sec 8
FA-056	2013	CA	46.313960	-104.280000	T7N, R59E, Sec 36
FA-073	2017	UC	46.26935	-104.10616	T6N, R61E, Sec 17
FA-080	2017	UC	46.41594	-104.29672	T8N, R59E, Sec 25
FA-082	2017	UC	46.41345	-104.25412	T8N, R60E, Sec 29
FA-087	2017	UC	46.27378	-104.21088	T6N, R60E, Sec 16
FA-088	2017	UC	46.25013	-104.1889	T6N, R60E, Sec 27
FA-094	2017	UC	46.28035	-104.17121	T6N, R60E, Sec 14
FA-095	2017	UC	46.29907	-104.17636	T6N, R60E, Sec 2

*BLM Status: CA = Confirmed Active, UC = Unconfirmed

Source: MTFWP 2018

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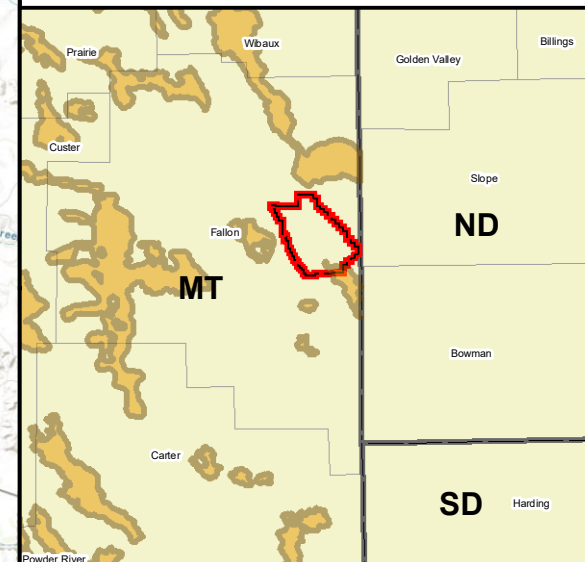
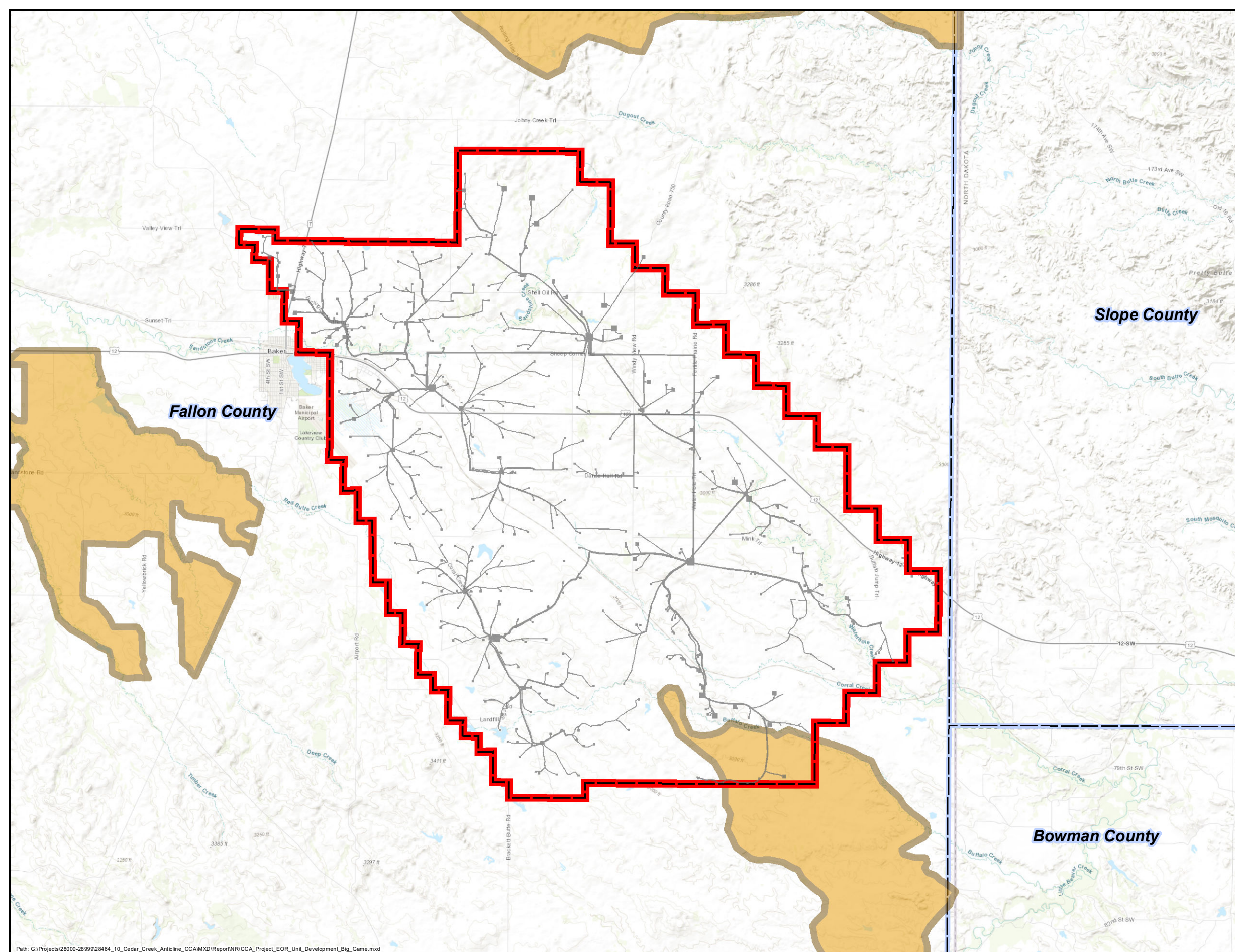
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ATTACHMENT 1

Figures

CCA - EOR Unit Development Big Game Crucial Winter Range

-  EOR Unit Development Boundary
-  EOR Unit Development Proposed Infrastructure
-  Big Game Crucial Winter Range (BLM) (02/13/2018)
-  County



Scale: 1:100,000
Projection: NAD 1983 UTM Zone 13N

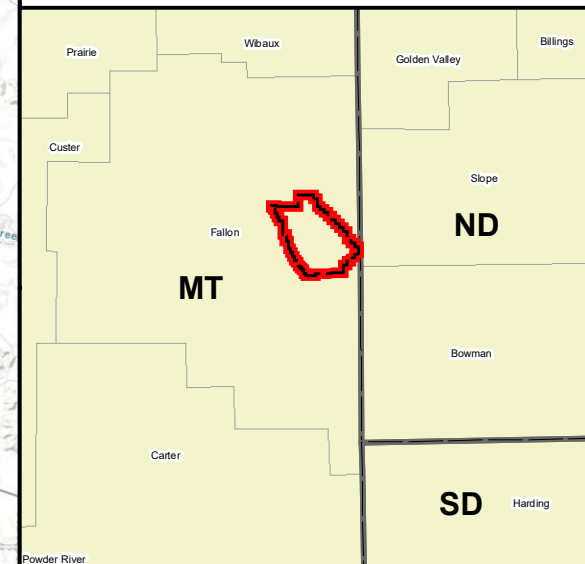
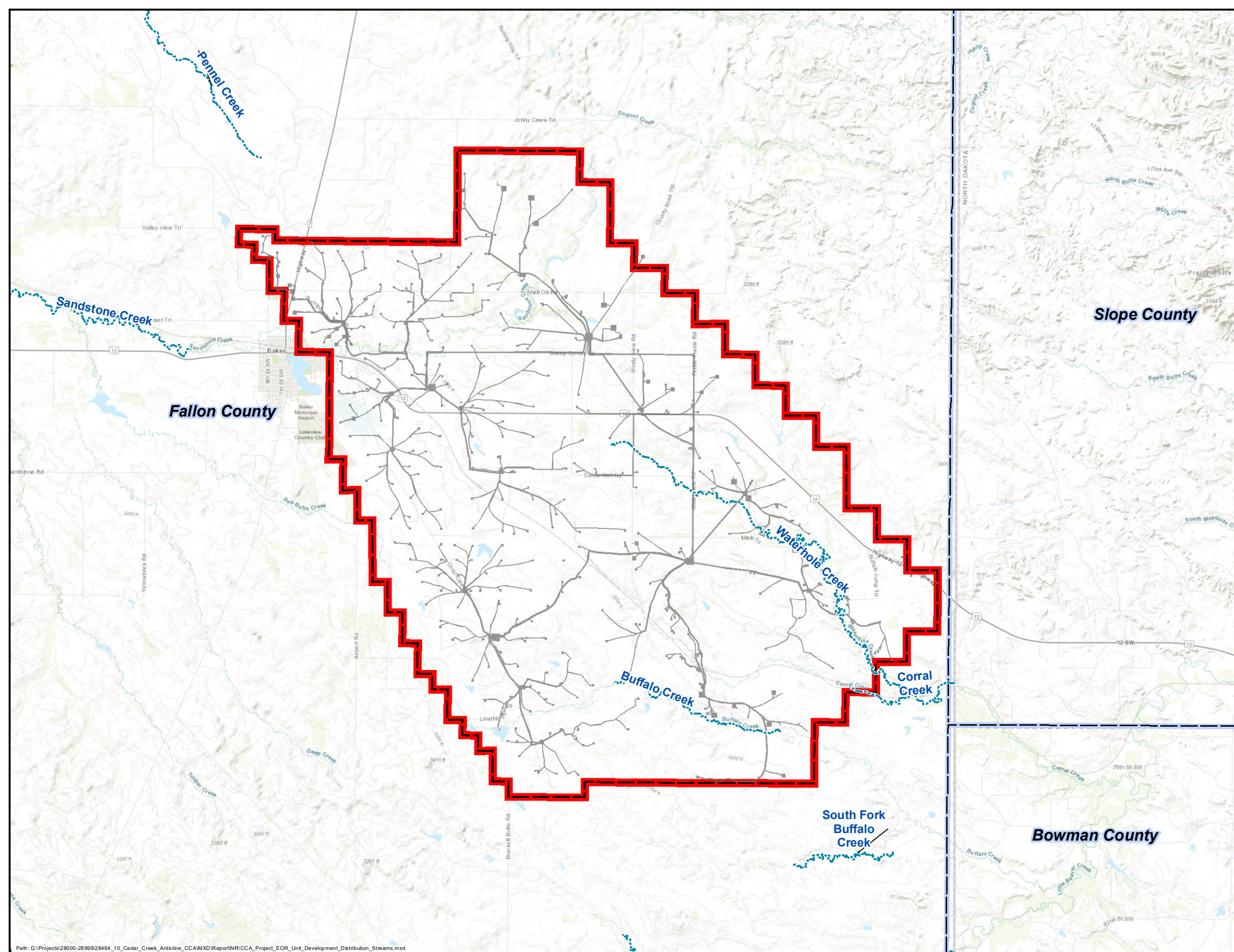


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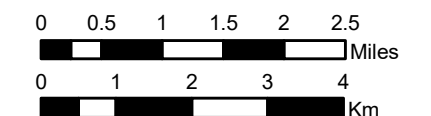
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CCA - EOR Unit Development Fish Distribution Streams

-  EOR Unit Development Boundary
-  EOR Unit Development Proposed Infrastructure
-  Fish Distribution Stream (MT FWP) (10/08/2015)
-  County



Scale: 1:100,000
Projection: NAD 1983 UTM Zone 13N

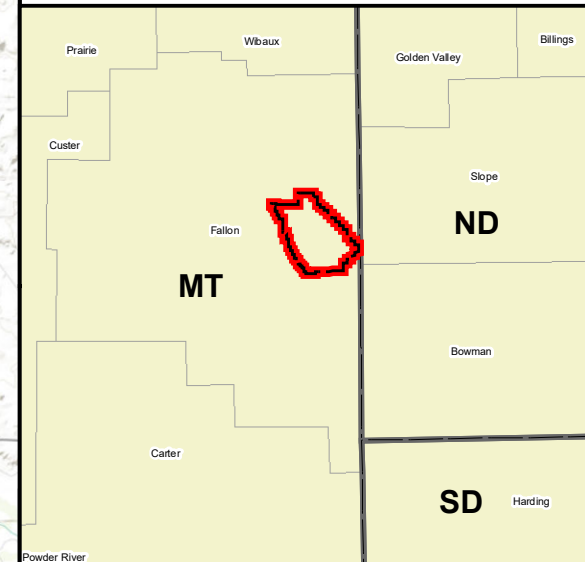


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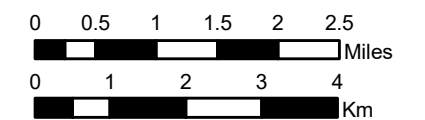
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CCA - EOR Unit Development Prairie Dog Colonies

-  EOR Unit Development Boundary
-  EOR Unit Development Proposed Infrastructure
-  Prairie Dog Colony
-  1/2-mile Survey Buffer
-  County



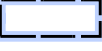
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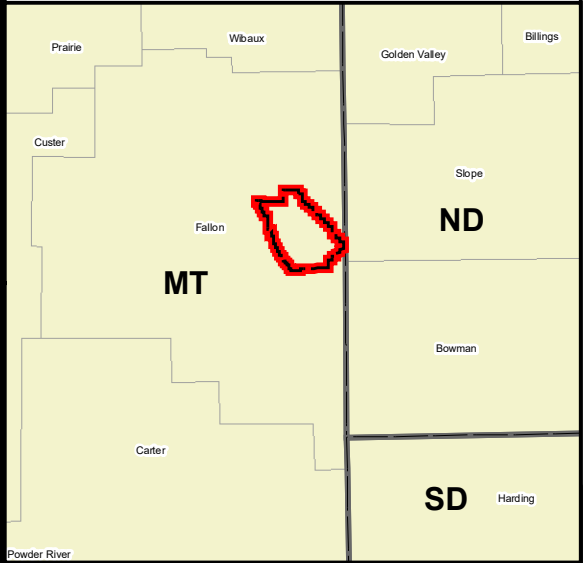
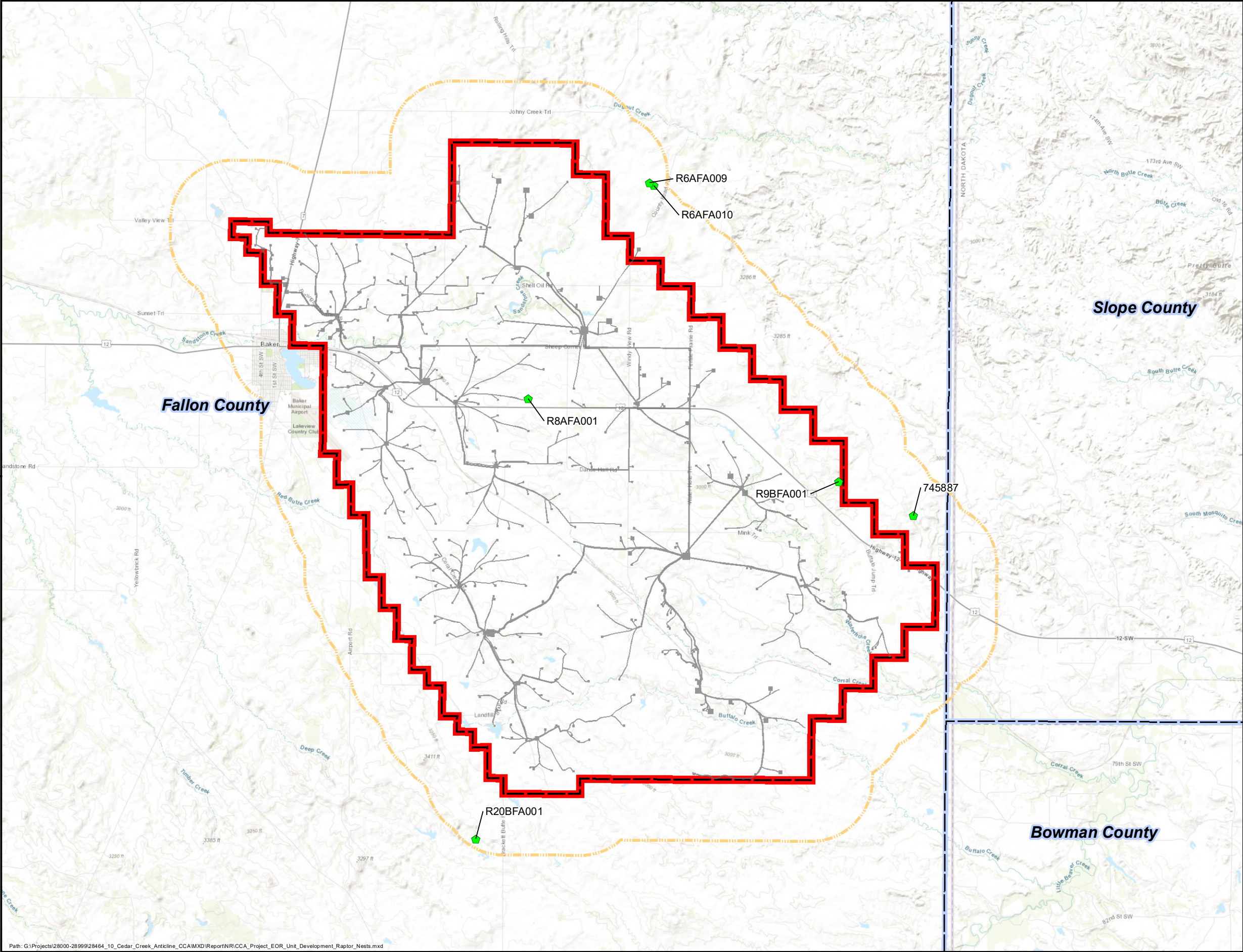


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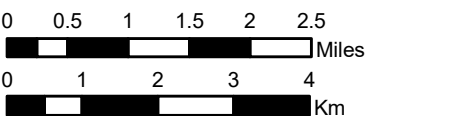
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CCA - EOR Unit Development
Raptor Nests

-  EOR Unit Development Boundary
-  EOR Unit Development Proposed Infrastructure
-  Raptor Nest (SWCA) (2015-2016)
-  County
-  1-mile Survey Buffer



Scale: 1:100,000
Projection: NAD 1983 UTM Zone 13N

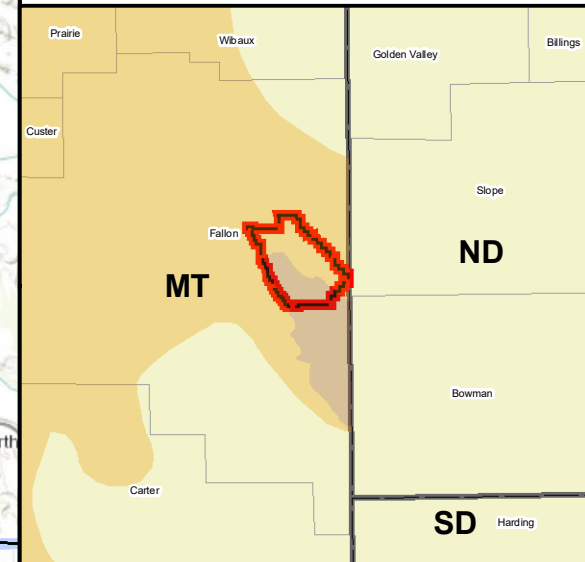


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CCA - EOR Unit Development Sharp-tailed and Greater Sage Grouse

-  EOR Unit Development Boundary
-  EOR Unit Development Proposed Infrastructure
-  Sharp-tailed Grouse Lek (MT FWP) (03/21/2018)
-  Greater Sage-Grouse Lek (MT FWP) (03/21/2018)
-  County
-  2-mile Survey Buffer
-  3.1 mile Survey Buffer
- Sage Grouse Habitat Management Area (BLM) (08/16/2016)**
 -  GRSG General Habitat Management Area (GHMA)
 -  GRSG Restoration Habitat Management Area (RHMA)



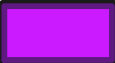
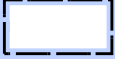
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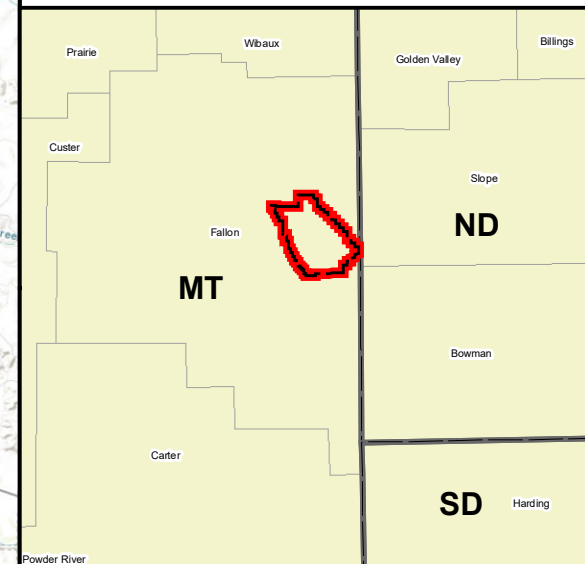


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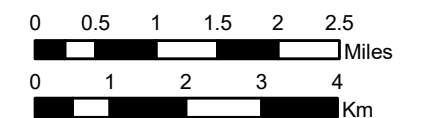
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CCA - EOR Unit Development Wading Bird Rookery and Eagle Winter Roost

-  EOR Unit Development Boundary
-  EOR Unit Development Proposed Infrastructure
-  Potential Wading Bird Rookery / Eagle Winter Roost (SWCA) (2015)
-  1-mile Survey Buffer
-  County



Scale: 1:100,000
Projection: NAD 1983 UTM Zone 13N



Date: 6/5/2018

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ATTACHMENT 2

Montana/Dakotas BLM Sensitive Species Occurrence Information for Species Excluded from Further Discussion

ESA Listed Species and BLM Montana/Dakotas Sensitive Species

Common Name	Scientific Name	Known or Suspected in the BLM Miles City Field Office District	Reasoning for Exclusion from Further Discussion	References
American bittern	<i>Botaurus lentiginosus</i>	Known	The Project area lacks freshwater wetlands with tall emergent vegetation suitable for this species.	MNHP and MTFWP 2018
Black tern	<i>Chilodoniass niger</i>	Known	The Project area is outside the primary breeding range of this species. Ponds, lakes, and reservoirs provide suitable foraging habitat. This species is likely to occur only as a transitory migrant and is not brought forward for review.	MNHP and MTFWP 2018
Black-backed woodpecker	<i>Picoides arcticus</i>	Suspected	No suitable habitat is present in the Project area. There are no recently burned forested areas or any lodgepole pine or Douglas-fir forests.	MNHP and MTFWP 2018
Caspian tern	<i>Hydroprogne caspia</i>	Known	The Project area is outside the primary breeding range of this species. Ponds, lakes, and reservoirs provide suitable foraging habitat. This species is likely to occur only as a transitory migrant and is not brought forward for further discussion.	MNHP and MTFWP 2018
Common tern	<i>Sterna hirundo</i>	Known	The Project area is outside the primary breeding range of this species. Ponds, lakes, and reservoirs provide suitable foraging habitat. This species is likely to occur only as a transitory migrant and is not brought forward for further discussion.	MNHP and MTFWP 2018
Franklin's gull	<i>Leucophocuss pipixcan</i>	Known	The Project area is outside the primary breeding range of this species. Ponds, lakes, and reservoirs provide suitable foraging habitat. This species is likely to occur only as a transitory migrant and is not brought forward for further discussion.	MNHP and MTFWP 2018

Appendix F
Resource Report for Aquatics, Vegetation, and Wildlife
Cedar Creek Anticline Enhanced Oil Recovery Unit Development Project Plan of Development

Common Name	Scientific Name	Known or Suspected in the BLM Miles City Field Office District	Reasoning for Exclusion from Further Discussion	References
McCown's longspur	<i>Rhychophanes mccownii</i>	Known	The Project area is outside the primary breeding range of this species in Montana. This species is likely to occur only as a transitory migrant and is not brought forward for further discussion.	MNHP and MTFWP 2018; Ritter 2011
Peregrine falcon	<i>Falco peregrinus</i>	Known	Suitable hunting habitat is present in the Project area at large lakes and reservoirs where ducks and/or shorebirds might congregate. No nesting habitat is present, however, and this species is likely to occur only as a transitory migrant so is not brought forward for further discussion.	MNHP and MTFWP 2018
Red knot	<i>Calidris canutus rufa</i>	Suspected	Limited suitable habitat is present in the Project area, primarily at Lake Baker and other reservoirs. This species is likely to occur only as a transitory migrant and is not brought forward for further discussion.	MTFWP 2005; MNHP and MTFWP 2018
Veery	<i>Catharus fuscescens</i>	Known	The Project area is outside the primary breeding range of this species. This species is likely to occur only as a transitory migrant and is not brought forward for further discussion.	MNHP and MTFWP 2018
White-faced ibis	<i>Plegadis chihi</i>	Suspected	The Project area is outside the primary breeding range of this species. Ponds, lakes, and reservoirs provide suitable foraging habitat. This species is likely to occur only as a transitory migrant and is not brought forward for further discussion.	MNHP and MTFWP 2018
Iowa darter	<i>Etheostoma exile</i>	Known	Iowa darter is known to occur in the BLM MCFO in southern Fallon County and northeast Carter County. No Iowa darters were collected during fisheries surveys conducted within Buffalo, Corral, and Waterhole Creeks.	MTFWP 2015a, 2015b; MNHP and MTFWP 2018

Common Name	Scientific Name	Known or Suspected in the BLM Miles City Field Office District	Reasoning for Exclusion from Further Discussion	References
Paddlefish	<i>Polyodon spathula</i>	Known	Paddlefish is a large river species that occurs in the Yellowstone River downstream of the Project area. The small streams in the Project area do not contain habitat for paddlefish.	MTFWP 2005, 2015a, 2015b; MNHP and MTFWP 2018
Sauger	<i>Sander canadensis</i>	Known	Sauger inhabit large rivers and reservoirs. Habitat for sauger does not occur within the creeks which flow through the Project area. Sauger are known to occur downstream of the Project area in the Little Missouri River in North Dakota and O'Fallon Creek in Montana.	MTFWP 2005, 2015a, 2015b; MNHP and MTFWP 2018
Sturgeon chub	<i>Macrhybopsis gelida</i>	Known	Sturgeon chub are typically found in the rapid, gravelly turbid waters in larger, plains rivers. Habitat for sturgeon chub is not present within the small tributary streams within the Project area. No sturgeon chub were collected during surveys of Buffalo, Corral, and Waterhole Creeks. Sturgeon chub are known to occur downstream of the Project area in the lower Yellowstone River drainage.	MTFWP 2005, 2015a, 2015b; MNHP and MTFWP 2018
A mayfly	<i>Raptoheptagenia cruentata</i>	Known	This species is associated with larger, perennially flowing prairie streams and rivers with sand-gravel dominated bottoms with cobble riffles. Habitat for this species is not present within the Project area.	MTFWP 2015b; MNHP and MTFWP 2018
Pallid bat	<i>Antrozous pallidus</i>	Known	The Project area is outside of the species range and there is no suitable habitat present.	MTFWP 2015b; MNHP and MTFWP 2018
Spotted bat	<i>Euderma maculatum</i>	Suspected	The Project area lacks coniferous forests or large escarpments. This species has a narrow habitat tolerance.	MTFWP 2015b; MNHP and MTFWP 2018

Common Name	Scientific Name	Known or Suspected in the BLM Miles City Field Office District	Reasoning for Exclusion from Further Discussion	References
Spiny softshell	<i>Apalone spinifera</i>	Known	The spiny softshell is primarily a riverine species, occupying large rivers and river impoundments, but also occurs in lakes, ponds along rivers, pools along intermittent streams, bayous, irrigation canals, and oxbows. In the BLM MCFO it is found along the Missouri River, Yellowstone River, and immediate tributaries. The spiny softshell does not travel overland to reach suitable habitat. The spiny softshell is unlikely to have suitable habitat within the creeks in the Project area.	Werner et al. 2004; BLM 2013; MNHP and MTFWP 2018

BLM = Bureau of Land Management
MCFO = Miles City Field Office
MNHP = Montana Natural Heritage Program
MTFWP = Montana Fish, Wildlife & Parks

References

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ATTACHMENT 3
Delineated Wetlands and Waterbodies Table

Delineated Wetlands and Waterbodies Table

Feature ID* of Wetland or Non-Wetland Waterbody	Location		Delineated Polygon Area [†] (acres)
	Latitude	Longitude	
W10FA007	46.36177	-104.246	0.1
W1AFA003	46.30111	-104.0799	49.2
W1AFA004	46.29721	-104.0805	2.5
W1AFA006	46.30452	-104.0913	17.7
W1AFA011	46.30314	-104.1639	31.2
W1AFA012	46.28336	-104.1049	9.6
W1AFA014	46.27343	-104.1242	25.7
W1AFA015	46.27454	-104.1152	10.6
W1AFA017	46.27776	-104.1361	0.5
W1AFA020	46.39653	-104.2828	4.6
W1AFA021	46.3968	-104.2854	3.6
W1AFA022	46.39635	-104.2802	0.7
W1AFA023	46.3929	-104.2795	18.4
W1AFA034	46.34359	-104.1156	4.3
W1AFA035	46.34864	-104.1218	7.4
W1AFA036	46.39529	-104.1937	0.4
W1AFA037	46.39665	-104.1941	0.1
W1AFA901	46.30494	-104.1743	17.8
W1BFA001	46.26972	-104.1475	2.7
W1BFA002	46.27045	-104.1551	18.9
W1BFA003	46.26921	-104.1426	3.4
W1BFA004	46.28098	-104.1427	13.8
W1BFA005	46.28546	-104.1454	0.6
W1BFA006	46.28362	-104.1519	12.4
W1BFA007	46.28579	-104.1548	1.3
W1BFA008	46.27697	-104.1314	16.8
W1BFA009	46.26796	-104.2	1.2
W1BFA010	46.38027	-104.2374	1.1
W1BFA011	46.38118	-104.2312	2.2
W1BFA012	46.31477	-104.2163	25.7
W1BFA012	46.30951	-104.2138	3.4
W1BFA013	46.30637	-104.2093	1.5
W1BFA013	46.30799	-104.207	5.9
W1BFA014	46.3124	-104.1992	3.9
W1BFA014	46.31775	-104.2039	21.1
W1BFA015	46.30796	-104.2001	4.5
W1BFA016	46.32324	-104.2081	0.7
W1BFA017	46.3306	-104.127	2.8
W1BFA018	46.31409	-104.0648	1.0
W1BFA019	46.31344	-104.0611	0.2
W1BFA020	46.31511	-104.0639	0.2
W1BFA021	46.30638	-104.0569	5.9

Appendix F

Resource Report for Aquatics, Vegetation, and Wildlife
Cedar Creek Anticline Enhanced Oil Recovery Unit Development Project Plan of Development

Feature ID* of Wetland or Non-Wetland Waterbody	Location		Delineated Polygon Area [†] (acres)
	Latitude	Longitude	
W1BFA022	46.34556	-104.2354	15.2
W1BFA022	46.35123	-104.2435	29.5
W1BFA023	46.34409	-104.2449	23.6
W1BFA024	46.32046	-104.178	2.2
W2AFA001	46.3122	-104.0532	0.1
W2AFA002	46.31412	-104.0534	0.1
W2AFA003	46.33099	-104.0811	0.1
W2AFA004	46.32963	-104.0828	0.0
W2AFA005	46.33575	-104.0944	5.6
W2AFA008	46.34188	-104.1468	2.6
W2AFA013	46.38064	-104.1447	0.6
W2AFA014	46.37822	-104.1459	0.9
W2AFA015	46.37561	-104.1506	6.0
W2AFA017	46.32279	-104.136	0.2
W2AFA019	46.32198	-104.1433	0.1
W2AFA025	46.31509	-104.1534	0.3
W2AFA027	46.29556	-104.203	0.2
W2AFA030	46.29933	-104.2191	2.3
W2AFA031	46.3065	-104.2253	8.6
W2BFA002	46.31582	-104.197	2.7
W2BFA003	46.31229	-104.1899	5.2
W2BFA004	46.30989	-104.1572	0.2
W2BFA004	46.31213	-104.1719	19.9
W2BFA006	46.31302	-104.1543	1.5
W2BFA008	46.3712	-104.2328	1.1
W2BFA009	46.37237	-104.2354	3.5
W2BFA011	46.36872	-104.2316	1.3
W2BFA012	46.36818	-104.2292	0.2
W2BFA014	46.3818	-104.2238	0.7
W2BFA015	46.37695	-104.2228	0.5
W2BFA016	46.37163	-104.2208	3.7
W2BFA017	46.37	-104.2208	0.3
W2BFA021	46.31938	-104.2338	20.7
W2BFA023	46.32488	-104.2442	0.7
W2BFA024	46.31738	-104.2388	26.8
W2BFA026	46.35662	-104.2328	0.8
W2BFA029	46.33968	-104.0844	10.7
W2BFA030	46.32557	-104.1132	0.5
W2BFA032	46.37298	-104.1324	0.6
W3AFA001	46.35456	-104.2544	93.0
W3AFA006	46.36031	-104.2565	0.1
W3AFA007	46.35746	-104.2596	4.2
W3AFA008	46.35917	-104.26	1.0
W3AFA009	46.35941	-104.2526	0.6

Feature ID* of Wetland or Non-Wetland Waterbody	Location		Delineated Polygon Area [†] (acres)
	Latitude	Longitude	
W3AFA010	46.36117	-104.2515	0.0
W3AFA011	46.36057	-104.2513	0.0
W3AFA014	46.30262	-104.1215	45.1
W3AFA016	46.35933	-104.2004	0.1
W3AFA017	46.36283	-104.2138	10.4
W3AFA018	46.35878	-104.2268	2.8
W3AFA019	46.36048	-104.2323	6.7
W3AFA020	46.30601	-104.1876	12.3
W3AFA022	46.30999	-104.1899	1.1
W3AFA023	46.30669	-104.1916	3.9
W3AFA024	46.30274	-104.1946	2.8
W3AFA025	46.30413	-104.1971	1.9
W3AFA026	46.3027	-104.1987	0.2
W3AFA027	46.30756	-104.1976	5.8
W3AFA028	46.30653	-104.1952	0.6
W3AFA029	46.37526	-104.204	22.6
W3AFA030	46.37943	-104.2026	0.4
W3AFA033	46.36523	-104.1992	24.1
W3AFA034	46.38511	-104.2051	1.2
W3AFA035	46.38074	-104.2114	6.2
W3AFA038	46.38522	-104.1952	4.0
W3AFA039	46.3884	-104.1892	13.4
W3AFA040	46.38577	-104.2226	5.9
W3AFA047	46.41142	-104.209	0.5
W3AFA048	46.40961	-104.2105	0.0
W4AFA001	46.27834	-104.2016	25.5
W4AFA002	46.27908	-104.2114	9.9
W4AFA003	46.27942	-104.198	1.1
W4AFA004	46.28065	-104.1983	0.2
W4AFA006	46.28537	-104.1932	0.2
W4AFA006	46.28556	-104.1937	0.0
W4AFA007	46.2873	-104.1912	0.1
W4AFA008	46.29563	-104.1845	11.3
W4AFA009	46.2909	-104.178	0.8
W4AFA011	46.29356	-104.1888	25.5
W4AFA012	46.29739	-104.1934	4.6
W4AFA014	46.29406	-104.1724	6.2
W4AFA014	46.29752	-104.1788	3.8
W4AFA022	46.31629	-104.1385	0.7
W4BFA007	46.34881	-104.167	0.9
W4BFA009	46.34158	-104.1974	8.0
W4BFA010	46.34631	-104.1914	1.3
W4BFA011	46.34541	-104.1869	3.1
W4BFA012	46.35032	-104.2026	0.4

Appendix F

Resource Report for Aquatics, Vegetation, and Wildlife
Cedar Creek Anticline Enhanced Oil Recovery Unit Development Project Plan of Development

Feature ID* of Wetland or Non-Wetland Waterbody	Location		Delineated Polygon Area [†] (acres)
	Latitude	Longitude	
W4BFA013	46.34723	-104.2132	28.6
W4BFA015	46.34284	-104.2156	3.5
W4BFA016	46.34415	-104.2182	0.7
W4BFA017	46.33194	-104.2084	10.6
W4BFA018	46.33121	-104.2118	0.1
W4BFA022	46.33673	-104.1716	0.3
W4BFA023	46.33883	-104.1668	1.8
W4BFA026	46.32801	-104.176	0.6
W4BFA027	46.31952	-104.1692	33.0
W4BFA028	46.32357	-104.1691	0.6
W4BFA029	46.28385	-104.1452	73.2
W4BFA030	46.33464	-104.1626	0.9
W4BFA031	46.33379	-104.1659	0.0
W4BFA032	46.34468	-104.1539	5.1
W4BFA033	46.38017	-104.1771	0.4
W4BFA036	46.33735	-104.2537	1.8
W4BFA037	46.33657	-104.2465	1.1
W4BFA038	46.34039	-104.245	6.2
W4BFA041	46.37993	-104.2704	3.2
W4BFA043	46.37772	-104.271	0.0
W4BFA044	46.37336	-104.2666	2.5
W4BFA045	46.37311	-104.2698	0.1
W4BFA046	46.37102	-104.2671	0.1
W4BFA047	46.39483	-104.2903	3.2
W5AFA002	46.32842	-104.1516	11.5
W5AFA004	46.32739	-104.1463	2.6
W5AFA005	46.32499	-104.1361	0.0
W5AFA006	46.33728	-104.1395	5.0
W5AFA009	46.349	-104.1044	0.2
W5AFA010	46.35121	-104.1057	1.5
W5AFA011	46.3526	-104.1102	2.5
W5AFA012	46.36718	-104.1154	0.2
W5AFA016	46.3371	-104.185	2.0
W5AFA017	46.33623	-104.2064	7.2
W5AFA018	46.33349	-104.2026	0.3
W5AFA019	46.36751	-104.1652	1.0
W5AFA020	46.34118	-104.1671	9.1
W5AFA021	46.34687	-104.1573	0.4
W5AFA022	46.34888	-104.1732	1.3
W5AFA024	46.31496	-104.1786	0.9
W5AFA026	46.32431	-104.1969	1.5
W7AFA001	46.38518	-104.2281	0.8
W7AFA002	46.38699	-104.2266	0.7
W7AFA003	46.38837	-104.2356	0.1

Appendix F

Resource Report for Aquatics, Vegetation, and Wildlife
Cedar Creek Anticline Enhanced Oil Recovery Unit Development Project Plan of Development

Feature ID* of Wetland or Non-Wetland Waterbody	Location		Delineated Polygon Area [†] (acres)
	Latitude	Longitude	
W7AFA004	46.39354	-104.2483	8.9
W7AFA005	46.38951	-104.2681	0.0
W7AFA006	46.39234	-104.2465	0.0
W7AFA009	46.38651	-104.2453	2.4
W7AFA009	46.38605	-104.2444	1.0
W7AFA010	46.39188	-104.2489	0.8
W7AFA011	46.3928	-104.2514	3.3
W7AFA012	46.38792	-104.2504	1.8
W7AFA013	46.38459	-104.2417	0.7
W7AFA014	46.38327	-104.2413	0.5
W7AFA015	46.37915	-104.2479	3.0
W7AFA015	46.37803	-104.2474	1.9
W7AFA016	46.37994	-104.2423	5.1
W7AFA017	46.41305	-104.193	0.0
W7AFA017	46.40989	-104.1937	0.1
W7AFA017	46.41386	-104.1928	0.1
W7AFA018	46.41459	-104.1934	0.3
W7AFA020	46.41357	-104.1768	0.5
W7AFA021	46.4137	-104.1799	0.3
W7AFA022	46.37634	-104.2444	2.9
W7AFA023	46.37688	-104.2429	0.2
W7AFA024	46.37211	-104.2489	4.2
W7AFA025	46.37253	-104.2437	0.8
W7AFA026	46.37101	-104.2495	1.6
W7AFA027	46.36926	-104.2545	1.7
W7AFA028	46.36943	-104.2516	0.2
W7AFA029	46.36927	-104.2501	1.2
W7AFA031	46.36911	-104.2457	2.7
W7AFA033	46.36979	-104.2414	0.1
W7AFA034	46.36919	-104.2409	0.2
W7AFA037	46.29705	-104.2225	2.9
W7AFA038	46.30127	-104.2271	0.8
W7AFA039	46.30378	-104.2344	0.1
W7AFA040	46.30288	-104.2338	1.0
W7AFA041	46.30046	-104.2322	0.1
W7AFA043	46.30801	-104.2388	0.9
W7AFA047	46.34315	-104.2305	1.6
W7AFA048	46.33934	-104.2279	1.8
W7AFA049	46.32816	-104.2202	22.8
W8AFA004	46.34662	-104.1009	7.4
W8AFA009	46.37567	-104.167	4.4
W8AFA010	46.37778	-104.1815	12.2
W8AFA011	46.37745	-104.1953	9.2
W9AFA001	46.39143	-104.2738	4.7

Feature ID* of Wetland or Non-Wetland Waterbody	Location		Delineated Polygon Area [†] (acres)
	Latitude	Longitude	
W9AFA002	46.39393	-104.2748	3.6
W9AFA003	46.39066	-104.2857	1.0
W9AFA006	46.34103	-104.2387	5.5
W9AFA007	46.3362	-104.2351	0.0
W9AFA009	46.32727	-104.2245	0.0
W9AFA010	46.33472	-104.236	27.5
W9AFA011	46.38734	-104.1865	3.8
W9AFA018	46.36887	-104.2646	0.2
W9AFA019	46.27794	-104.1586	2.3
W9AFA021	46.27415	-104.1642	18.5
W9AFA022	46.27486	-104.1757	1.8
W9AFA025	46.26336	-104.1908	0.4
W9AFA026	46.26386	-104.1973	0.4
W9AFA027	46.29148	-104.2045	22.1
W9AFA028	46.28886	-104.212	13.5
W9AFA029	46.26876	-104.1808	31.3
W9AFA030	46.27887	-104.189	4.5
W9AFA031	46.27765	-104.181	0.2
W9AFA032	46.277	-104.1798	0.6
W9AFA034	46.26947	-104.1779	1.1
W9AFA035	46.30322	-104.1464	29.6
W9AFA036	46.30339	-104.1451	0.8
W9AFA037	46.30515	-104.1544	0.5
W9AFA039	46.29374	-104.1338	24.6
W9AFA040	46.28769	-104.1273	0.2
W9AFA041	46.28456	-104.132	0.0
W9AFA043	46.27231	-104.0966	2.2
W9AFA045	46.31829	-104.118	10.8
W9AFA047	46.31034	-104.1147	25.7
W9AFA050	46.29078	-104.0833	0.6
W9AFA051	46.28899	-104.0739	0.2
W9AFA052	46.28917	-104.0854	28.1
W9AFA053	46.32573	-104.1016	57.7
W9AFA056	46.32714	-104.098	0.5
W9AFA057	46.32397	-104.103	0.4
W9AFA058	46.318	-104.0984	0.2
W9AFA901	46.39955	-104.1733	13.2
W9AFA903	46.40607	-104.195	1.5
W9AFA904	46.39981	-104.1785	2.7
WB10FA001	46.36174	-104.2455	0.1
WB11FA001	46.31139	-104.1572	0.4
WB1AFA001	46.2933	-104.0733	0.0
WB1AFA002	46.29399	-104.0736	0.1
WB1AFA003	46.29418	-104.0734	0.0

Feature ID* of Wetland or Non-Wetland Waterbody	Location		Delineated Polygon Area [†] (acres)
	Latitude	Longitude	
WB1AFA004	46.29445	-104.074	0.2
WB1AFA005	46.29513	-104.0748	0.0
WB1AFA006	46.29768	-104.0756	0.3
WB1AFA008	46.29938	-104.0776	0.1
WB1AFA009	46.30087	-104.0802	0.1
WB1AFA010	46.29834	-104.0881	2.2
WB1AFA011	46.30264	-104.082	0.1
WB1AFA015	46.28093	-104.1243	0.1
WB1AFA016	46.27883	-104.1235	0.5
WB1AFA017	46.27787	-104.1184	0.1
WB1AFA018	46.2873	-104.1453	0.5
WB1AFA019	46.28861	-104.1367	0.6
WB1AFA022	46.39632	-104.2827	0.0
WB1AFA034	46.39809	-104.1941	0.1
WB1BFA001	46.28394	-104.1396	0.2
WB1BFA002	46.28665	-104.1443	0.1
WB1BFA003	46.38022	-104.2378	1.0
WB1BFA004	46.30935	-104.2178	0.1
WB1BFA005	46.30809	-104.2125	0.4
WB1BFA006	46.30984	-104.1995	0.8
WB1BFA007	46.31668	-104.2043	1.2
WB1BFA009	46.31421	-104.0624	0.1
WB1BFA010	46.34063	-104.1936	0.7
WB2AFA001	46.31049	-104.052	0.2
WB2AFA002	46.31391	-104.0551	0.3
WB2AFA003	46.32967	-104.0835	0.1
WB2AFA004	46.38255	-104.1452	0.0
WB2AFA025	46.31502	-104.1535	0.4
WB2BFA001	46.31528	-104.1966	0.0
WB2BFA002	46.30938	-104.1577	0.0
WB2BFA003	46.31364	-104.1584	0.4
WB2BFA004	46.26486	-104.1747	0.1
WB2BFA005	46.36896	-104.2326	0.3
WB2BFA006	46.36615	-104.2213	0.0
WB3AFA001	46.29383	-104.0969	0.3
WB3AFA003	46.29213	-104.1133	0.6
WB3AFA004	46.29271	-104.112	0.0
WB3AFA005	46.29044	-104.1139	0.1
WB3AFA006	46.36129	-104.2113	1.1
WB3AFA007	46.36107	-104.2323	2.2
WB3AFA008	46.30886	-104.189	4.2
WB3AFA009	46.30572	-104.1872	0.1
WB3AFA010	46.30698	-104.1971	0.2
WB3AFA011	46.30337	-104.198	0.0

Feature ID* of Wetland or Non-Wetland Waterbody	Location		Delineated Polygon Area [†] (acres)
	Latitude	Longitude	
WB3AFA012	46.30957	-104.1966	0.0
WB3AFA013	46.30511	-104.1644	0.1
WB3AFA015	46.38446	-104.2126	0.6
WB3AFA016	46.40517	-104.1975	0.0
WB3AFA017	46.29683	-104.1095	0.0
WB4AFA001	46.28259	-104.1903	0.5
WB4AFA002	46.28063	-104.1981	0.0
WB4AFA003	46.28392	-104.2028	0.6
WB4AFA004	46.28114	-104.2136	0.0
WB4AFA005	46.28585	-104.1944	0.2
WB4AFA006	46.28562	-104.1899	0.0
WB4AFA007	46.28536	-104.1955	0.0
WB4AFA008	46.29187	-104.1836	0.0
WB4BFA003	46.34242	-104.2005	0.3
WB4BFA004	46.34593	-104.1898	1.4
WB4BFA005	46.34619	-104.21	1.6
WB4BFA009	46.29212	-104.1638	1.7
WB4BFA010	46.34388	-104.152	1.3
WB4BFA011	46.33789	-104.2542	0.1
WB4BFA012	46.33458	-104.2478	0.2
WB4BFA013	46.32203	-104.207	12.2
WB4BFA014	46.38092	-104.2696	0.0
WB4BFA015	46.38095	-104.27	0.1
WB4BFA016	46.37204	-104.2694	1.7
WB4CFA001	46.36791	-104.2559	0.4
WB5AFA004	46.33769	-104.1868	0.7
WB5AFA001	46.32937	-104.1526	0.2
WB5AFA002	46.33601	-104.1359	0.3
WB5AFA003	46.34844	-104.106	5.2
WB5AFA005	46.36762	-104.1654	0.2
WB5AFA006	46.32452	-104.1973	2.0
WB7AFA001	46.38949	-104.2681	1.7
WB7AFA002	46.38918	-104.2465	0.1
WB7AFA003	46.39128	-104.2501	0.2
WB7AFA004	46.38461	-104.2418	0.1
WB7AFA005	46.38325	-104.2411	0.1
WB7AFA006	46.37291	-104.248	0.3
WB7AFA007	46.36959	-104.2542	1.3
WB7AFA008	46.36927	-104.2501	0.1
WB7AFA009	46.36903	-104.2461	1.9
WB7AFA010	46.36918	-104.2409	0.1
WB7AFA011	46.37014	-104.2588	1.3
WB7AFA012	46.29879	-104.2257	0.0
WB7AFA013	46.30801	-104.2387	0.1

Feature ID* of Wetland or Non-Wetland Waterbody	Location		Delineated Polygon Area [†] (acres)
	Latitude	Longitude	
WB8AFA002	46.30834	-104.1306	3.0
WB8AFA003	46.29709	-104.1163	0.0
WB8AFA004	46.29774	-104.1158	0.0
WB8AFA005	46.31556	-104.1377	0.8
WB8AFA006	46.28211	-104.1146	1.3
WB9AFA001	46.39047	-104.1848	3.1
WB9AFA002	46.36958	-104.2629	1.1
WB9AFA010	46.3234	-104.1262	2.5

* Wetland or Non-Wetland Waterbody identification number as shown on the resource maps in Appendix G of the Plan of Development.

[†] Acres of wetland or non-wetland waterbody polygon; some Feature IDs may have multiple polygons due to a delineation break (e.g., access road with culvert) within the wetland or non-wetland waterbody.

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ATTACHMENT 4
Black-tailed Prairie Dog Colony Data Forms

Recording Date	<u>10/18/2015 7:54:00 AM</u>	Burrowing Owl Feature ID	PD2BFA001
Survey Type	<u>Other (add text in comments)</u>	Survey Rational	Field determination

Log Book		Log Book Page			
Observer	<u>Ryan Barnhill</u>				
Determination Desc	<u>Observed large active prairie dog town</u>				
Plant Community Type	<u>Poa pratensis</u>				
Bare Ground (%)	<u>0-10</u>	%	Plant Cover (%)	<u>61-70</u>	%
Species	<u>Black-tailed P-dog</u>		Number of Burrows /Acre	<u>>10</u>	
Acreage of Active Burrows	<u>90</u>		Acreage of Inactive Burrows	<u>0</u>	
Habitat Extends Beyond ROW	<u>No</u>		Associated Speces		
Disturbance	<u>Located in active cow pasture</u>				
Comments					

Feature Number	<u>PD2BFA001</u>
Photo Direction	<u>North</u>
Photo Type	
Photo Number	<u>1</u>
Comments	



Recording Date	<u>10/18/2015 7:54:00 AM</u>	Burrowing Owl Feature ID	PD2BFA001
Survey Type	<u>Other (add text in comments)</u>	Survey Rational	Field determination

Feature Number

PD2BFA001

Photo Direction

East

Photo Type

Photo Number

2

Comments



Feature Number

PD2BFA001

Photo Direction

South

Photo Type

Photo Number

3

Comments



Recording Date	<u>10/18/2015 7:54:00 AM</u>	Burrowing Owl Feature ID	PD2BFA001
Survey Type	<u>Other (add text in comments)</u>	Survey Rational	Field determination

Feature Number

PD2BFA001

Photo Direction

West

Photo Type

Photo Number

4

Comments



Recording Date	<u>10/8/2015 11:35:00 AM</u>	Burrowing Owl Feature ID	PD4BFA001
Survey Type	<u>Other (add text in comments)</u>	Survey Rational	Appears on pre-survey target I

Log Book	Log Book Page		
Observer	<u>Russell Duncan, Robert Cawthe</u>		
Determination Desc			
Plant Community Type	<u>Mixed grasses</u>		
Bare Ground (%)	<u>0-10</u>	%	Plant Cover (%) <u>81-90</u> %
Species	<u>Black-tailed P-dog</u>		
Number of Burrows /Acre	<u>0-5</u>		
Acreage of Active Burrows	<u>2</u>	Acreage of Inactive Burrows	<u>8</u>
Habitat Extends Beyond ROW	Associated Speces		
Disturbance	<u>Grazing</u>		
Comments			

Feature Number	<u>PD4BFA001</u>
Photo Direction	<u>West</u>
Photo Type	
Photo Number	<u>1</u>
Comments	



Recording Date	<u>10/8/2015 11:35:00 AM</u>	Burrowing Owl Feature ID	PD4BFA001
Survey Type	<u>Other (add text in comments)</u>	Survey Rational	Appears on pre-survey target I

Feature Number

PD4BFA001

Photo Direction

West

Photo Type

Photo Number

2

Comments



Recording Date	<u>9/28/2015 8:11:00 AM</u>	Burrowing Owl Feature ID	PD5AFA001
Survey Type	<u>Other (add text in comments)</u>	Survey Rational	Appears on pre-survey target I

Log Book		Log Book Page	<u>35</u>
Observer	<u>Mac Fuller</u>		
Determination Desc	<u>Aerial target point</u>		
Plant Community Type	<u>Low grassland</u>		
Bare Ground (%)	<u>0-10</u>	%	Plant Cover (%) <u>81-90</u> %
Species	<u>Black-tailed P-dog</u>	Number of Burrows /Acre	<u>>10</u>
Acreage of Active Burrows	<u>28</u>	Acreage of Inactive Burrows	<u>6</u>
Habitat Extends Beyond ROW	<u>Not Applicable</u>	Associated Speces	<u>Burrowing owls observed flying</u>
Disturbance	<u>Grazing present</u>		
Comments	<u>Points collected at burrows where burrowing owls were observed.</u>		

Feature Number PD5AFA001
 Photo Direction North West

Photo Type
 Photo Number 1
 Comments
 Overview



Recording Date	<u>9/28/2015 8:11:00 AM</u>	Burrowing Owl Feature ID	PD5AFA001
Survey Type	<u>Other (add text in comments)</u>	Survey Rational	Appears on pre-survey target I

Feature Number PD5AFA001

Photo Direction

Photo Type

Photo Number 2

Comments

Burrow where BUOW observed with whitewash present



Recording Date	<u>8/27/2015 8:50:00 AM</u>	Burrowing Owl Feature ID	PD8AFA001
Survey Type	<u>Other (add text in comments)</u>	Survey Rational	Appears on pre-survey target I
Log Book	<u>08/27/2015 - 001</u>	Log Book Page	<u>1</u>
Observer	<u>Dave Ackerman, Bob Cawthern</u>		
Determination Desc			
Plant Community Type	<u>Mixed grass prairie</u>		
Bare Ground (%)	<u>0-10</u>	%	Plant Cover (%) <u>91-100</u> %
Species	<u>Black-tailed P-dog</u>	Number of Burrows /Acre	<u>>10</u>
Acreage of Active Burrows	<u>63</u>	Acreage of Inactive Burrows	<u>5</u>
Habitat Extends Beyond ROW	<u>No</u>	Associated Speces	<u>Black-tailed prairie dog</u>
Disturbance	<u>Oil and gas pipeline and pump jack and developed pad. OHP. Pasture.</u>		
Comments	<u>Pad under additional construction SE corner of PDT and new pipeline scar running thru PDT. Lots of work activity and vehicles at pad.</u>		

Recording Date	<u>8/27/2015 1:19:00 PM</u>		Burrowing Owl Feature ID	PD8AFA002	
Survey Type	<u>Other (add text in comments)</u>		Survey Rational	Appears on pre-survey target I	
Log Book	<u>005</u>		Log Book Page	<u>1</u>	
Observer	<u>Dave Ackerman, Bob Cawthern</u>				
Determination Desc					
Plant Community Type	<u>Big Sage steppe</u>				
Bare Ground (%)	<u>21-30</u>	%	Plant Cover (%)	<u>71-80</u>	%
Species	<u>Black-tailed P-dog</u>		Number of Burrows /Acre	<u>>10</u>	
Acreage of Active Burrows	<u>139</u>		Acreage of Inactive Burrows	<u>23</u>	
Habitat Extends Beyond ROW	<u>No</u>		Associated Speces	<u>BUOW (2)</u>	
Disturbance	<u>Man-made reservoir</u>				
Comments	<u>Two BUOW on mounds High density of BT prairie dogs.</u>				
Feature Number	<u>PD/08A/FA/002</u>				
Photo Direction	<u>West</u>				
Photo Type					
Photo Number	<u>1</u>				
Comments					



Recording Date	<u>8/27/2015 1:19:00 PM</u>	Burrowing Owl Feature ID	PD8AFA002
Survey Type	<u>Other (add text in comments)</u>	Survey Rational	Appears on pre-survey target I

Feature Number

PD/08A/FA/002

Photo Direction

South

Photo Type

Photo Number

2

Comments

RESERVOIR



Recording Date	<u>9/17/2015 8:34:00 AM</u>		Burrowing Owl Feature ID	PD9AFA001	
Survey Type	<u>Other (add text in comments)</u>		Survey Rational	Appears on pre-survey target I	
Log Book			Log Book Page		
Observer	<u>Robert Cawthern</u>				
Determination Desc					
Plant Community Type	<u>Prairie grasses</u>				
Bare Ground (%)	<u>21-30</u>	%	Plant Cover (%)	<u>71-80</u>	%
Species	<u>Black-tailed P-dog</u>		Number of Burrows /Acre	<u>>10</u>	
Acreage of Active Burrows	<u>1</u>		Acreage of Inactive Burrows	<u>3</u>	
Habitat Extends Beyond ROW			Associated Speces	<u>Western meadowlark</u>	
Disturbance	<u>Grazing</u>				
Comments					

ATTACHMENT 5
Northern Long-eared Bat Habitat Assessment Addendum

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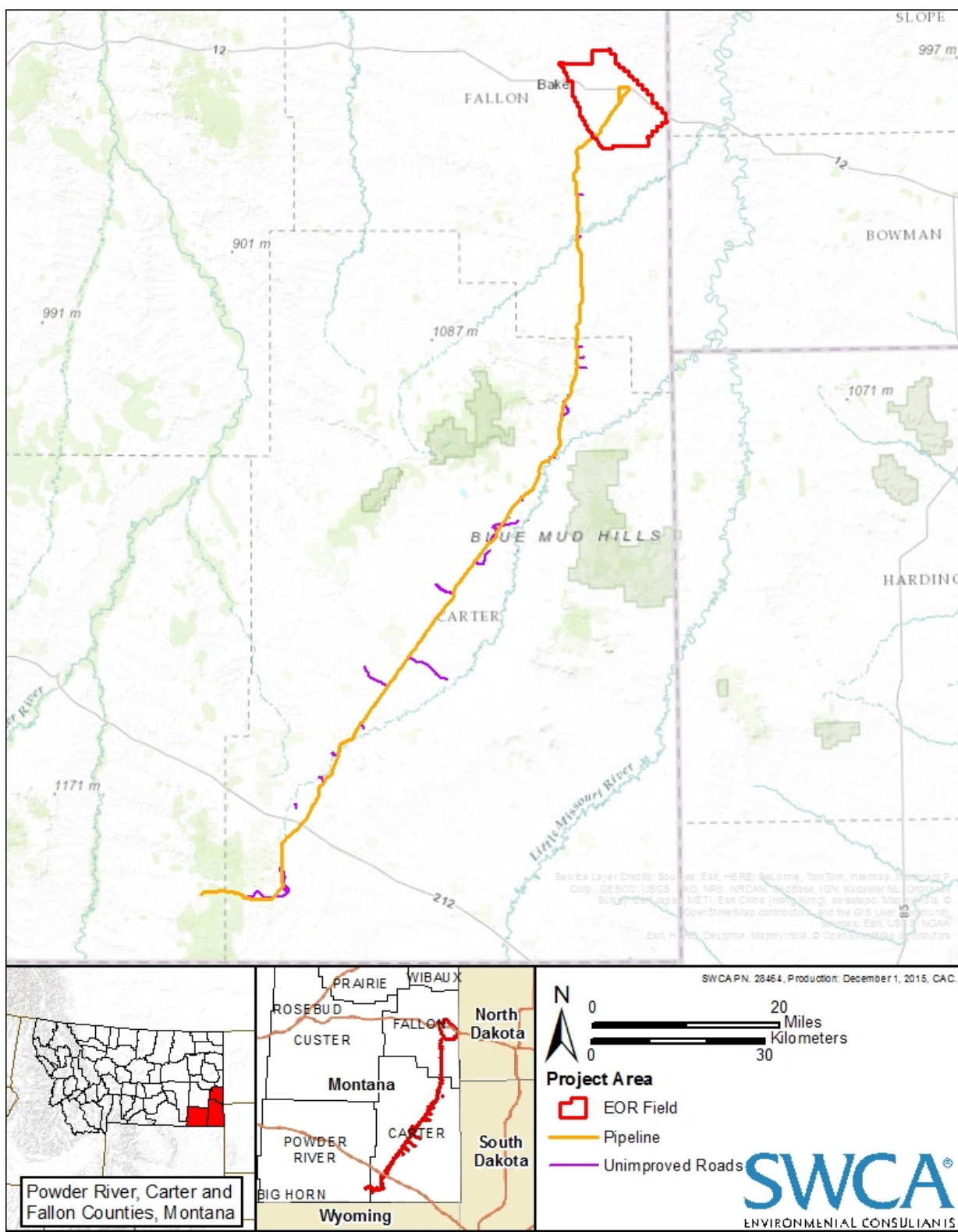
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1.0 INTRODUCTION

Denbury Green Pipeline – Montana, LLC (Denbury) is proposing to develop an Enhanced Oil Recovery (EOR) operation within the Cedar Creek Anticline (CCA) which includes the CCA CO₂ Pipeline and EOR Unit Development Project (Project) (Figure 1). The Project encompasses an approximately 44,490-acre EOR Unit Development field and a 110-mile-long pipeline with approximately 49 miles of unimproved access roads. This report covers both the CO₂ Pipeline and the EOR Unit Development projects. The pipeline access roads will be a combination of both temporary roads used during construction and permanent roads used for long-term maintenance access. The proposed status of the roads is described in the Plans of Development. A portion of the pipeline and its access roads overlaps with the EOR Unit Development area.

For purposes of this report, SWCA Environmental Consultants (SWCA) evaluated the EOR Unit Development in its entirety, the 100-foot-wide permanent and temporary rights-of-way (ROWs) surrounding the pipeline, and the 25-foot-wide ROW surrounding the pipeline access roads, for a total of 45,938 acres for the Project. The Project occurs on primarily undeveloped private property and Bureau of Land Management (BLM)-administered land in Carter, Fallon, and Powder River Counties, Montana. Full descriptions of the Project are provided in separate Plans of Development for the pipeline and EOR development.

Denbury retained SWCA to complete a habitat assessment for the northern long-eared bat (*Myotis septentrionalis*; NLEB), with a common name synonym used by the Montana/Dakotas BLM as the northern myotis, within the Project area. SWCA's assessment includes a desktop review, which relies on publicly and readily available data from geographic information system (GIS) datasets, applicable regulatory agencies, other online resources, and SWCA's in-house sources.



2.0 NORTHERN LONG-EARED BAT OVERVIEW

2.1 SPECIAL STATUS DESIGNATION

The U.S. Fish and Wildlife Service (USFWS) listed the NLEB as a threatened species, under the Endangered Species Act of 1973 (ESA), on April 2, 2015 (80 *Federal Register* 17973 18033). Once a widespread and abundant species, the NLEB has been decimated by the emergence of the fungal pathogen *Pseudogymnoascus destructans* which causes white-nose syndrome (WNS) in bats. In portions of the NLEB's range, population estimates have declined by 99% (USFWS 2013a). The USFWS Information for Planning and Consultation (IPaC) planning tool identifies the NLEB as potentially occurring in Powder River, Carter, and Fallon Counties (USFWS 2016a).

As part of the listing, an interim 4(d) rule was implemented within portions of its range affected by WNS (80 *Federal Register* 17973 18033). A final 4(d) rule was published on January 1, 2016 (81 *Federal Register* 1900 1922). The Project area currently falls outside of the WNS zone (USFWS 2016b). The closest known WNS zone county is in central South and North Dakotas (USFWS 2016b). For areas outside the WNS zone, the final 4(d) rule exempts incidental take from lawful activities. The Project area, in its entirety, is outside of the WNS zone and thus incidental take of NLEB resulting from lawful Project activities is not prohibited under the ESA. A determination of proposed critical habitat was not included in the proposed listing (USFWS 2013b). In 2016, the designation of critical habitat for the NLEB was determined to be not prudent (81 *Federal Register* 24707 24714).

2.2 SPECIES GENERAL DESCRIPTION

The NLEB is a medium-sized bat about 3.0 to 3.7 inches in length with a wingspan of 9.0 to 10.0 inches (USFWS 2015). NLEB usually can be distinguished by their long ears and symmetrical, sharply pointed tragi (Freehan et al. 2014). This species hibernates in caves and mines and distributes across the landscape during summer months. Within the United States, the NLEB occurs from Maine south to North Carolina, and west into Oklahoma, the Dakotas, and the very eastern edge of Montana (Figure 2). NLEBs tend to arrive at hibernacula from mid-August through November and emerge from hibernacula from early April through May (USFWS 2013b). NLEBs migrate from their hibernacula to suitable summer habitat, which includes a wide variety of forested/wooded habitats (i.e., live trees and/or snags >3 inches dbh that have exfoliating bark, cracks, crevices, and/or cavities) where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands adjacent edges of agricultural fields, old fields and pastures, as well as linear features such as fencerows, riparian forests, and other wooded corridors. Isolated trees are considered suitable habitat when they exhibit the characteristics of a suitable roost tree and are less than 1,000 feet from the next nearest suitable roost tree, woodlot, or wooded fencerow (USFWS 2014a).

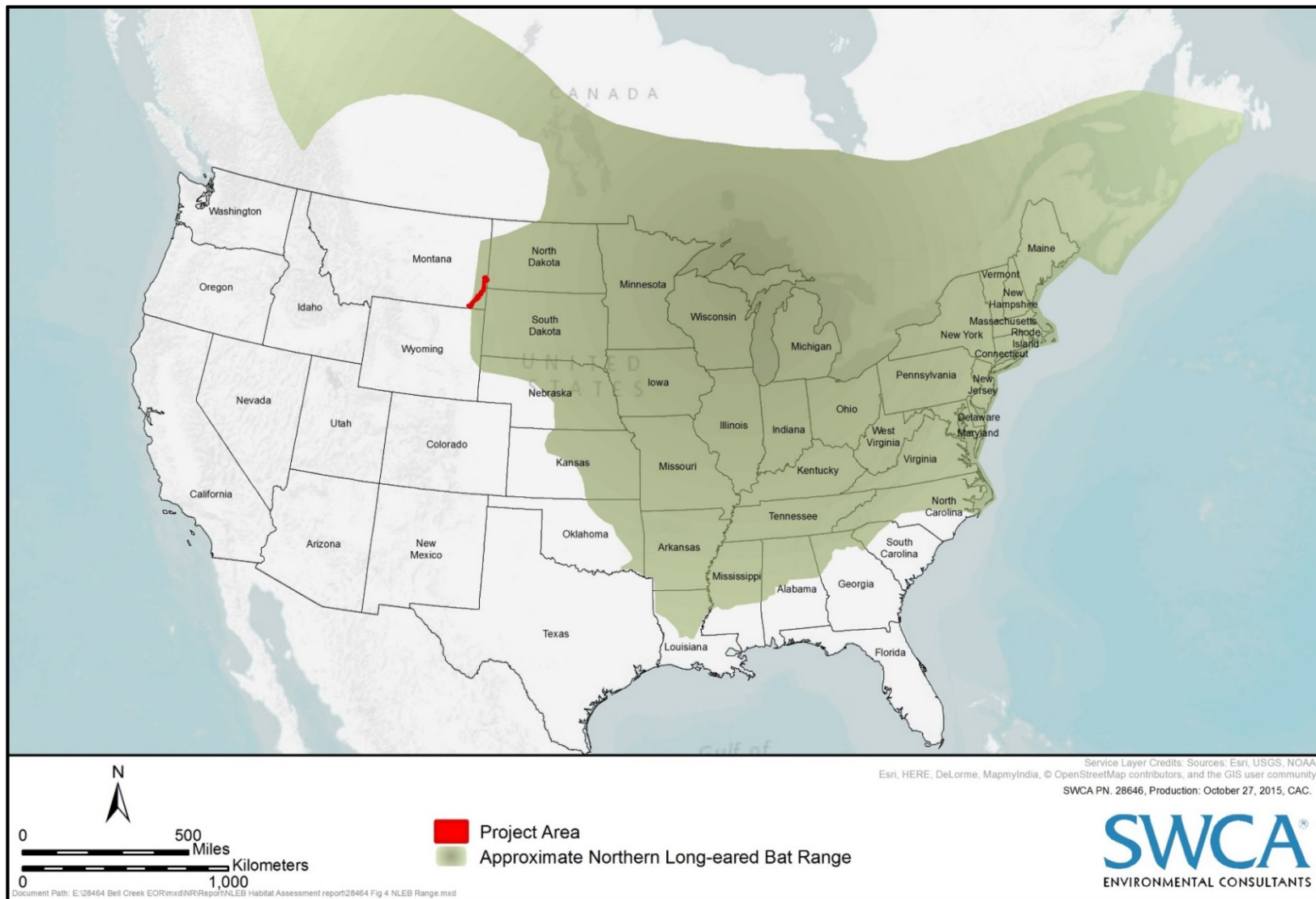


Figure 2. Northern long-eared bat range map.

NLEBs tend to arrive at hibernacula from mid-August through November and emerge from hibernacula from early April through May (USFWS 2013b). NLEBs migrate from their hibernacula to suitable summer habitat, which the USFWS considers to consist of:

...a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags >3 inches dbh that have exfoliating bark, cracks, crevices, and/or cavities), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Isolated trees are considered suitable habitat when they exhibit the characteristics of a suitable roost tree and are less than 1,000 feet from the next nearest suitable roost tree, woodlot, or wooded fencerow. (USFWS 2014a)

Although NLEBs may travel, forage, or occasionally roost within adjacent landscapes, this species is primarily a forest interior species that requires variable amounts of canopy closure (USFWS 2014b). Reproductively mature female NLEBs form summer maternity colonies in suitable summer habitat while non-reproductive females and males may roost in small groups or singly (USFWS 2013b). NLEBs will roost in smaller trees as well as human-made structures such as barns, sheds, and attics (USFWS 2013b, 2014b).

NLEBs tend to migrate between 35 and 55 miles and as far as 168 miles from summer maternity grounds to hibernacula in the fall (USFWS 2013b). Additional information indicates the NLEB is not known to be a long-distance migrant. Distances have been documented between 56 and 89 kilometers (35–55 miles) (Nagorsen and Brigham 1993).

NLEBs will hibernate in caves and cave-like structures including mines, railroad tunnels, and storm sewers (USFWS 2013b). The nearest areas of known caves are in the little Rockies, Pryor Mountains, and the Black Hills (BLM 2015). Rather than roosting in large clusters, NLEBs roost singly, often deep within recesses and cracks (USFWS 2013b).

3.0 IDENTIFIED THREATS

WNS is currently the predominant threat to the NLEB, especially throughout the Northeast (USFWS 2014b). Although the disease has not yet spread throughout the NLEB's entire range, WNS is currently found in at least 30 of 37 states where the NLEB occurs and continues to spread (USFWS 2016b). The WNS zone extends into an additional seven states (USFWS 2016b). The bat was listed under the assumption that if WNS spreads throughout the range of the NLEB, it will have the same impact as seen in the Northeast (USFWS 2014a). Though population-level declines have not been linked to causes other than WNS, it is expected that the disease may make individuals more susceptible to other sources of mortality.

Human disturbance, alteration of hibernation sites, and loss of summer roosting and foraging habitat due to deforestation, are all thought to have contributed to the decline of the NLEB (USFWS 2014b). A few degrees of temperature change can make a hibernaculum unsuitable

for hibernating NLEBs. Gates or other structures to exclude people from hibernacula restrict bat flight and movement and change airflow and internal cave and mine microclimates. Also, cave-dwelling bats are vulnerable to human disturbance while hibernating. Bats use up their energy stores when aroused and may not survive the winter or females may not successfully give birth or rear young (USFWS 2005). If disturbance is frequent or severe enough, it may result in abandonment of the hibernaculum, which would likely lead to death by exposure, starvation, or predation. Frequent arousal from hibernation has also been linked to increased severity of infection and increases in mortality in bats with WNS (Reeder et al. 2012).

Highway and commercial development, surface mining, and wind facility construction permanently remove habitat and are prevalent in many areas of this bat's range. Timber harvest and forest management can remove or alter (improving or degrading) summer roosting and foraging habitat. Wind turbines kill bats, including NLEB, although only a small number of mortality events have been documented to date. However, many wind projects span the bat's range and many more are planned (USFWS 2014b).

4.0 ASSESSMENT METHODOLOGY

SWCA compiled vegetative community and land use data to determine if potentially suitable habitats for the NLEB exist in the Project area and evaluated the potential for NLEB to occur within those habitats. In addition, SWCA used aerial imagery to delineate wooded and forested areas within proposed disturbance that are within 56 miles of the nearest cave structures suitable for NLEB hibernacula, which in this case is Devils Tower, Crook County, Wyoming. Based on the results of the analysis, SWCA also provides a professional opinion as to potential effects to the species as a result of the Project, as defined in the ESA Section 7 consultation handbook (U.S. Fish and Wildlife Service and National Marine and Fisheries Service 1998).

Habitat assessment data include the Landscape Fire and Resource Management Planning Tools Program (LANDFIRE) vegetation data (LANDFIRE 2008), U.S. Geological Survey National Hydrography Dataset (NHD), National Agriculture Imagery Program (NAIP) 2015 imagery (U.S. Department of Agriculture [USDA] 2015), and Montana Natural Heritage Program (MNHP) wetland and riparian mapping center data (MNHP 2015). Sources for species distribution and occurrence data included the *Montana Field Guide* (MNHP and Montana Fish, Wildlife & Parks [MTFWP] 2018).

This habitat assessment categorized the LANDFIRE existing vegetation type layer into the following general vegetation categories, which were then classified as "Potentially Suitable Roosting Habitat," "Potentially Suitable Foraging Habitat or Travel Corridors," and "Likely Unsuitable" habitat types for NLEB.

- | | |
|----------------|----------------------|
| • Agricultural | • Shrubland |
| • Barren | • Sparsely vegetated |
| • Developed | • Open water |
| • Grassland | • Conifer |
| • Riparian | • Exotic herbaceous |

Typically, the LANDFIRE existing vegetation type layer does not incorporate small palustrine emergent wetlands (PEMs) within the dataset. Therefore, PEMs identified by the MNHP wetland and riparian mapping center (MNHP 2015) were overlaid and clipped from the vegetation layer to account for this type of habitat.

The aerial delineation of wooded or forested areas was completed in a geographic information system (GIS) platform using NAIP 2015 imagery for Montana (USDA 2015). All areas of proposed disturbance within 56 miles of Devils Tower were assessed at a 1:8,000 scale for the presence of forests or woodlots. Individual trees within 1,000 feet of other forested habitat were also delineated.

4.1 SITE DESCRIPTION

The Project area is within the Northwestern Great Plains Level III ecoregion, which is characterized by a semiarid rolling plain of shale and sandstone with occasional buttes. Native grassland vegetation has largely been replaced with spring wheat and alfalfa crops within areas where the topography is suitable for agriculture (U.S. Environmental Protection Agency 2000). Within the Project area, the Northwestern Great Plains is further categorized as the Sagebrush Steppe, Montana Central Grasslands, and Pine Scoria Hills Level IV ecoregions (Woods et al. 2002). Vegetation occurring within the Sagebrush Steppe ecoregion is transitional between the grasslands of the Montana Central Grassland and the woodlands of the Pine Scoria Hills, primarily consisting of sparse shrub vegetation mixed with native grasses. Shrub species commonly observed includes big sagebrush (*Artemisia tridentata*) and Nuttall's saltbush (*Atriplex nuttallii*) mixed with short-grass prairie of native grass species. The Montana Central Grassland ecoregion primarily supports grama-needlegrass-wheatgrass grassland with limited shrub vegetation and occurs on frigid soils that are often clayey and derived from residuum. The Pine Scoria Hills ecoregion only occurs at the southern end of the pipeline ROW and consists of rugged, broken land covered by open ponderosa pine (*Pinus ponderosa*)-Rocky Mountain juniper (*Juniperus scopulorum*) forest or ponderosa pine savanna. Savanna and extensive open grassland are located in more arid areas and consist of native grassland species with skunkbush sumac (*Rhus trilobata*) and western snowberry (*Symphoricarpos occidentalis*). Woodland grazing and historic small-scale coal mining occur within the Pine Scoria Hills.

4.1.1 Land Cover and Vegetation

The LANDFIRE vegetation data maps much of the Project area as Northwestern Great Plains Mixedgrass Prairie and Inter-Mountain Basins Big Sagebrush Steppe. Table 1 lists LANDFIRE vegetation types with the MNHP (2015) PEM data incorporated. The NLEB habitat classifications were derived from the LANDFIRE System Group attributes associated with each existing vegetation type as well as the MNHP (2015) PEM data.

Table 1. LANDFIRE Vegetation Types and MNHP PEMs within the Project Area

NLEB Habitat Classification	Vegetation Type	Acres	Percent of Project Area
Agricultural	Western Cool Temperate Close Grown Crop	2,204.4	4.80
	Western Cool Temperate Wheat	1,232.4	2.68
	Western Cool Temperate Fallow/Idle Cropland	414.3	0.90
	Western Cool Temperate Row Crop	57.4	0.12
	Western Cool Temperate Pasture and Hayland	29.3	0.06
Barren	Barren	114.5	0.25
Conifer	Northwestern Great Plains-Black Hills Ponderosa Pine Woodland and Savanna	132.8	0.29
Developed	Western Cool Temperate Developed Ruderal Shrubland	343.5	0.75
	Western Cool Temperate Urban Shrubland	313.6	0.68
	Developed-Roads	290.2	0.63
	Developed-Low Intensity	112.4	0.24
	Developed-Medium Intensity	87.3	0.19
	Western Cool Temperate Urban Herbaceous	74.7	0.16
	Western Cool Temperate Urban Deciduous Forest	6.0	0.01
	Developed-High Intensity	5.1	0.01
	Western Cool Temperate Developed Ruderal Evergreen Forest	3.2	0.01
	Western Cool Temperate Undeveloped Ruderal Grassland	0.8	<0.01
Exotic Herbaceous	Introduced Upland Vegetation-Annual Grassland	7.6	0.02
	Introduced Upland Vegetation-Perennial Grassland and Forbland	1.1	<0.01
Grassland	Northwestern Great Plains Mixedgrass Prairie	22,923.8	49.90
	Western Cool Temperate Developed Ruderal Grassland	2,121.8	4.62
	Western Great Plains Sand Prairie Grassland	892.5	1.94
	Western Great Plains Shortgrass Prairie	37.7	0.08
	Northern Rocky Mountain Lower Montane-Foothill-Valley Grassland	2.6	0.01
Open Water	Open Water	52.3	0.11
PEM Wetland	PEM Wetland	303.7	0.66
Riparian	Western Great Plains Floodplain Forest and Woodland	740.8	1.61
	Western Great Plains Floodplain Herbaceous	5.0	0.01
	Western Great Plains Wooded Draw and Ravine	2.7	0.01
Shrubland	Inter-Mountain Basins Big Sagebrush Steppe	12,844.1	27.96
	Northwestern Great Plains Shrubland	16.0	0.03
	Inter-Mountain Basins Greasewood Flat	13.3	0.03
	Inter-Mountain Basins Big Sagebrush Shrubland	8.5	0.02

NLEB Habitat Classification	Vegetation Type	Acres	Percent of Project Area
Sparsely Vegetated	Inter-Mountain Basins Curl-leaf Mountain Mahogany Shrubland	0.7	<0.01
	Inter-Mountain Basins Mat Saltbush Shrubland	0.4	<0.01
	Western Great Plains Sparsely Vegetated Systems	503.0	1.09
	Rocky Mountain Alpine/Montane Sparsely Vegetated Systems	38.5	0.08
Total		45,938.0	100.0

4.1.2 Hydrology and Geology

The Project area is within a semi-arid region of the Yellowstone and Little Missouri River Basins. The Project area encompasses numerous NHD streams and waterbodies including sections of two perennial streams: Boxelder Creek and Little Beaver Creek. The Project area also includes sections of several named and unnamed ephemeral/intermittent waterway segments, as well as perennial and intermittent lakes/ponds.

The majority (57.0%) of the Project area occurs on the Pierre shale geological unit. Table 2 summarizes the geological units that underlie the Project Area (Raines and Johnson 1995).

Table 2. Geological Units Occurring within the Project Area

Geological Unit	Primary Rock Type	Secondary Rock Type	Acres	Percentage of Project Area
Kp (Pierre shale)	Shale	Sandstone	26,188.7	57.0
Kfh (Fox Hill sandstone)	Sandstone	Mudstone	11,161.6	24.3
Khc (Hell Creek formation)	Sandstone	Mudstone	8,150.5	17.7
Tfu (Fort Union formation)	Shale	Siltstone	428.1	0.9
Qal (alluvial deposits)	Alluvium	Glacial Drift	9.1	<0.1
Total			45,938.0	100.0

4.2 MONTANA OCCURRENCES

There are three documented occurrences at three locations of the NLEB in Montana. The first occurrence was recorded in January 1978 when one individual was observed hibernating in an abandoned coal mine within river break habitat near the town of Culbertson, Richland County (Hendricks 2012; Swenson and Shanks 1979). The 1978 occurrence was a single hibernating male collected on January 12 (Swenson and Shanks 1979). In 2016, three individuals at two locations along the Missouri River in close proximity to the 1978 occurrence (MNHP and MTFWP 2018).

4.3 REGIONAL OCCURRENCES

The only documented occurrence of NLEB near the Project area is at Devils Tower National Monument, Wyoming, which is approximately 36 miles southeast of the southern end of the CO₂ pipeline. The occurrences were documented during the summer roosting season; no winter hibernacula were documented (Griscom and Keinath 2011; National Park Service 2017).

Schmidt (2003) reported that there were year-long populations documented in the Black Hills of South Dakota. The closest documented occurrences in the Black Hills are greater than 80 miles from the Project area.

The U.S. Forest Service conducted mist netting and acoustic surveys in 2007 on the Custer National Forest, Ashland District, Powder River County, approximately 50 miles west of the Project area. No occurrences of NLEB were recorded (Lenard et al. 2009).

The MNHP conducted mist netting and acoustic surveys targeting five bat species, including the NLEB, in 2003 and 2005. Six of these surveys (three each in Custer and Powder River Counties) occurred within 50 miles of the Project area. No NLEB occurrences were recorded during any of the 2003 or 2005 surveys (Hendricks et al. 2006).

4.4 SUMMER HABITAT

NLEBs generally roost in dead and dying trees with exfoliating bark, cracks, or crevices that provide shelter. Studies have shown fidelity to individual roost trees for 2 to 6 years (Gardner et al. 1991; Whitaker et al. 2004). However, because suitable roost trees are often dead or dying, in an advanced state of decay, or are otherwise unhealthy, they are an ephemeral resource on the landscape. NLEB have adapted to locating new roosts both within and across years (Silvis et al. 2015; USFWS 2015; Whitaker et al. 2004). From a study regarding NLEB maternity colony dynamics and the effects of roost removal on NLEB maternity colonies, Silvis et al. (2015) found that one NLEB colony used as many as 33 roosts over the course of the study. NLEBs generally switch roosts every 2 to 3 (or 5) days (USFWS 2014b). Silvis et al. (2015) determined that at least 20% of NLEB maternity roosts used by a given colony must be removed before there are observable effects on that colony (Silvis et al. 2015).

NLEBs generally forage within 3 miles of their roosts (USFWS 2014b). Therefore, a general estimate of the area that might be used by an NLEB (i.e., its hypothetical “home range”) can be described as the area of a 3-mile-radius circle (or approximately 18,086 acres) centered on a roost. Within these hypothetical home ranges, NLEBs forage on insect prey, drink from water sources, and roost in trees as described above.

4.5 WINTER HABITAT

Winter habitat for NLEBs consists of underground caves and cave-like structures. NLEBs have preferred temperature and humidity ranges and certain roosting structure requirements. NLEBs tend to roost individually deep within cracks and crevices. To avoid impacts to potential hibernacula, construction activities such as blasting, boring, and trenching, should occur after emergence from hibernacula and during the summer when NLEBs are presumed to be above

ground, mobile, and not hibernating. Should construction activities physically alter a potential hibernaculum, they may affect its suitability for hibernation. Physical alterations may affect airflow, temperature, and humidity.

No winter hibernacula are documented near the Project area. The closest known site documented as being used for winter hibernacula by this species is near Sturgis, South Dakota, which is over 80 miles southeast of the Project area (Schmidt 2003; Tigner and Stukel 2003). Only two hibernacula have been documented as occupied in the Black Hills (Schmidt 2003). Devils Tower in Wyoming is a suspected winter hibernacula and the southern portion of the Project is located within the 56 mile migration buffer for NLEB.

There are no active mines within in Carter, Fallon, or Powder River Counties (McCulloch 2012). Abandoned mines documented by the State of Montana occur near the Project area in Carter and Fallon Counties. There are minimal details on the abandoned mines, but many appear to be uranium and coal mines (Montana Bureau of Mines and Geology 2006). None of these mines are located within the Project area boundary.

Location data for active and abandoned mines in Wyoming were not available in most cases. Three active coal mines in Campbell County, Wyoming, are approximately 50 miles south of the Project's southern terminus (Wyoming State Geological Survey 2015). There also may be a number of mines in the Bear Lodge Mountains starting approximately 20 miles to the southeast of the Project area.

Furthermore, the geology within the Project area does not lend itself to abundant cave creation (Raines and Johnson 1995) as karst geology is typically underlain by limestone (Monroe 1970) which is absent from the Project area (see Table 2).

5.0 ASSESSMENT RESULTS

Since SWCA does not anticipate NLEB winter hibernacula to occur within the Project area due to a lack of karst-forming geology and lack of known hibernacula, this habitat assessment focused on summer habitat including those potentially suitable for roosting and foraging or as travel corridors. Table 3 indicates which LANDFIRE existing vegetation layers were categorized as potential habitat for the NLEB and Table 4 summarizes the acres of potential habitat within the Project area. The Conifer category is included as roosting habitat, as it is not only comprised of ponderosa pine and other evergreen trees but also contains an abundance of deciduous trees (NatureServe Explorer 2015) which may provide roosting habitat. The Riparian categories typically include an abundance of deciduous trees for roosting or are directly adjacent to such woodland. Both the Conifer and Riparian categories are also considered to be potential foraging habitat or traveling corridors for the NLEB. Open water and PEM wetlands represent potential foraging habitat, as this species may forage over water in areas with abundant insect prey (USFWS 2013a, 2014b), such as wetlands and non-wetland waterbodies that contain water throughout much of the year.

Table 3. LANDFIRE Existing Vegetation Types Categorized as Potential Summer Habitat for the NLEB

Existing Vegetation Type	Potentially Suitable Roosting Habitat	Potentially Suitable Foraging Habitat or Travel Corridors	Likely Unsuitable Vegetation
Grassland			X
Shrubland			X
Agricultural			X
Developed			X
Riparian	X	X	
Sparsely Vegetated			X
Conifer	X	X	
Barren			X
Open Water		X	
PEM Wetland		X	
Exotic Herbaceous			X

Table 4. Potential NLEB Summer Habitat within the Project Area

Existing Vegetation Type	Acres	Percentage within Project Area
Roosting and Foraging Habitat or Travel Corridors		
Riparian	748.5	1.6
Conifer	132.8	0.3
<i>Subtotal</i>	<i>881.3</i>	<i>1.9</i>
Foraging Habitat		
Open Water	52.3	0.1
PEM Wetland	303.7	0.7
<i>Subtotal</i>	<i>356.0</i>	<i>0.8</i>
Non-Habitat		
Grassland	25,978.4	56.6
Shrubland	12,883.0	28.0
Agricultural	3,937.8	8.6
Developed	1,236.8	2.7
Sparsely Vegetated	541.5	1.2
Barren	114.5	0.2
Exotic Herbaceous	8.7	<0.1
<i>Subtotal</i>	<i>44,700.7</i>	<i>97.3</i>
Total	45,938.0	100.0

Approximately 1.9% (881.3 acres) of the Project area is considered potentially suitable roosting habitat. In total, approximately 2.7% (1,237.4 acres) is considered potentially suitable habitat for roosting, foraging, or travel corridors (see Table 4). The remaining 97.3% (44,700.7 acres) is considered unsuitable for use by NLEB.

Based on an assessment of NAIP imagery (USDA 2015), approximately 11.9 acres of the proposed pipeline disturbance within 56 miles of Devils Tower are forested or wooded and would be cleared for construction. This includes all scattered ponderosa pine or rocky mountain juniper within or directly adjacent to proposed disturbance as well as individual trees within 1,000 feet of other forested habitat. All delineated forest or wooded habitats are displayed on Figure 3.

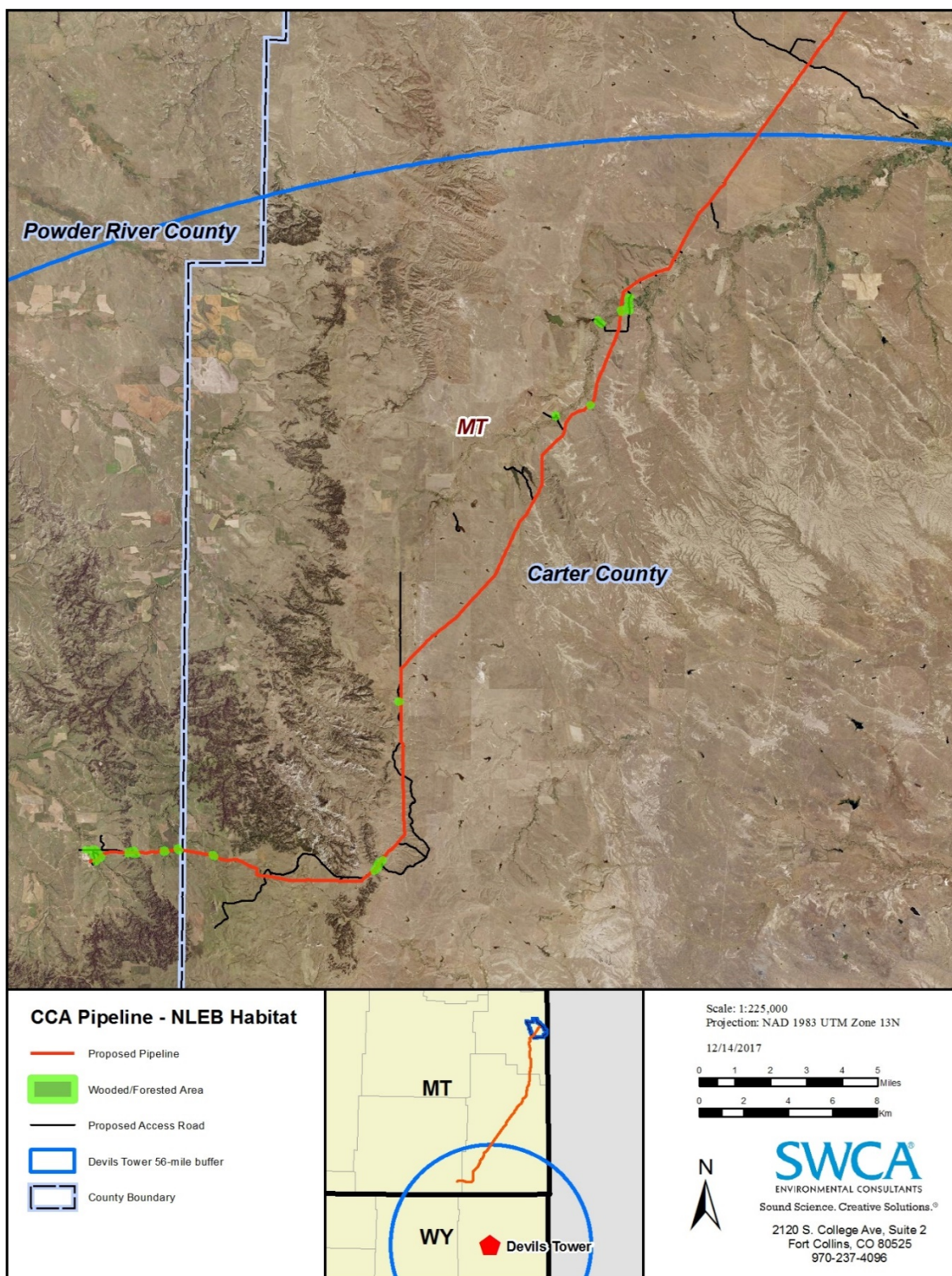


Figure 3. Delineated forested habitats within 56 miles of Devils Tower.

6.0 DISCUSSION

The Project area is located just within the western extent of NLEB range (see Figure 2) (USFWS 2015). Historically, the NLEB was rarely encountered along the western edge of its range (USFWS 2014b). More recently, the species is considered uncommon at western extremes of this range (Caceres and Barclay 2000). There are three confirmed observation of the species in Montana (MNHP and MTFWP 2018) and a recent thorough survey of bats within riparian areas in the lower Missouri and Yellowstone Rivers and tributaries in eastern Montana did not detect any NLEB either by capture or recorded vocalization (Hendricks et al. 2006).

The identified NLEB potential summer habitat within the Project area is minimal. Project construction is proposed to begin on June 15, 2019, and be completed by December 15, 2019, as outlined in Section 2.0 of this POD. Based on the timeframe, no impacts to NLEB-occupied summer or foraging habitat is expected. The majority of the Project area consists of grassland and shrubland, and although some NLEBs may use grassland and shrubland to travel when located adjacent to more suitable habitat, this vegetation type will quickly re-establish within areas cleared for construction. Therefore, any minimal foraging value associated with these habitats is temporary.

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ATTACHMENT 6
Black-footed Ferret Survey Report



ENVIRONMENTAL CONSULTANTS

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November 28, 2016

Mr. Kent Undlin
Wildlife Biologist
Bureau of Land Management Miles City Field Office
111 Garryowne Road
Miles City, Montana 59301

RE: Cedar Creek Anticline Project Black-footed Ferret Survey Results

Dear Mr. Undlin:

SWCA Environmental Consultants (SWCA) conducted black-footed ferret (*Mustela nigripes*) surveys on the Cedar Creek Anticline Project on behalf of Denbury Resources, Inc. (Denbury). The Cedar Creek Anticline Project includes portions of the Coral Creek Unit, Pennel Unit, and East Lookout Butte Unit, as well as a carbon dioxide pipeline that is approximately 110 miles long.

Six black-tailed prairie dog (*Cynomys ludovicianus*) towns that meet the U.S. Fish and Wildlife Service (USFWS) guidelines for minimum areas of prairie dog habitat for black-footed ferrets¹ were identified during surveys conducted by SWCA between August and December 2015. None of these six towns were individually greater than 80 acres; however, all six towns were linked as neighboring colonies (less than 4.34 miles in distance from one another), which created a complex of greater than 80 acres, thereby requiring black-footed ferret surveys, per USFWS guidance.¹

Only three of the towns in the complex were surveyed for black-footed ferrets: PD5AFA001, PD2BFA001, and PD8AFA001. The surveys were conducted from September 12 to 17, 2016, following Method 2 in the USFWS black-footed ferret survey guidelines.¹ PD5AFA001 was surveyed separately from PD8AFA001 and PD2BFA001, which were surveyed during the same night due to their proximity. The surveys were conducted by a team of two SWCA biologists, including one small mammal specialist familiar with black-footed ferrets. Weather conditions were acceptable for surveys throughout the survey period. The size, location, and survey dates for the prairie dog surveys are summarized in Table 1. Map attachments to this letter include an overview map of the complex and more detailed smaller-scale maps of each prairie dog town.

¹ U.S. Fish and Wildlife Service (USFWS). 1989. *Black-footed Ferret Survey Guidelines for Compliance with the Endangered Species Act*. USFWS, Denver, Colorado, and Albuquerque, New Mexico. April 1989.

Table 1. Prairie Dog Towns Surveyed for Black-footed Ferrets

Prairie Dog Town	Town Size (acres)	Location (T, R, S)	Survey Dates
PD5AFA001	16.4	T7N, R60E, S25	9/12–14/2016
PD2BFA001	42.9	T6N, R61E, S3	9/15–17/2016
PD8AFA002	77.4	T6N, R61E, S4, 8, 9	Not applicable
PD8AFA001	32.4	T7N, R61E, S27	9/15–17/2016
PD9AFA001	1.8	T8N, R60E, S35	Not applicable
PD4BFA001	4.6	T7N, R60E, S22	Not applicable

T, R, S = Township, Range, Section

The Bureau of Land Management exempted surveys on prairie dog town PD9AFA001 due to its small size (less than 2 acres) and its connection to only one other prairie dog town (PD4BFA001) in the complex within the 4.34-mile range. In addition, PD9AFA001 is over 4 miles from PD4BFA001, and is located on the opposite side of the highway and railroad from the nearest prairie dog town (personal communication, telephone conversation between Kent Undlin, Bureau of Land Management Wildlife Biologist, and Jake Powell, SWCA Senior Biologist, on August 23, 2016).

SWCA was notified that prairie dog town PD4BFA001 was poisoned by the landowner in 2016 and was no longer active (personal communication, email from Rusty Shaw, Denbury Environmental Compliance Manager, to Chad Barnes, SWCA Project Manager, on September 3, 2016). PD4BFA001 was surveyed by SWCA biologists on September 12, 2016, and it was determined that no prairie dogs were present and the town was inactive. No black-footed ferret surveys were conducted at this inactive town.

Prairie dog town PD8AFA002 was not surveyed because access to the location was not permitted by the landowner. The landowner denied access due to ongoing hunting on the landowner's land (personal communication, email from Clayton Breckenridge, Denbury Landman, to Mac Fuller, SWCA Environmental Specialist, on September 13, 2016).

No black-footed ferrets were observed and no signs of black-footed ferrets were identified during the surveys of black-tailed prairie dog towns PD5AFA001, PD8AFA001, and PD2BFA001.

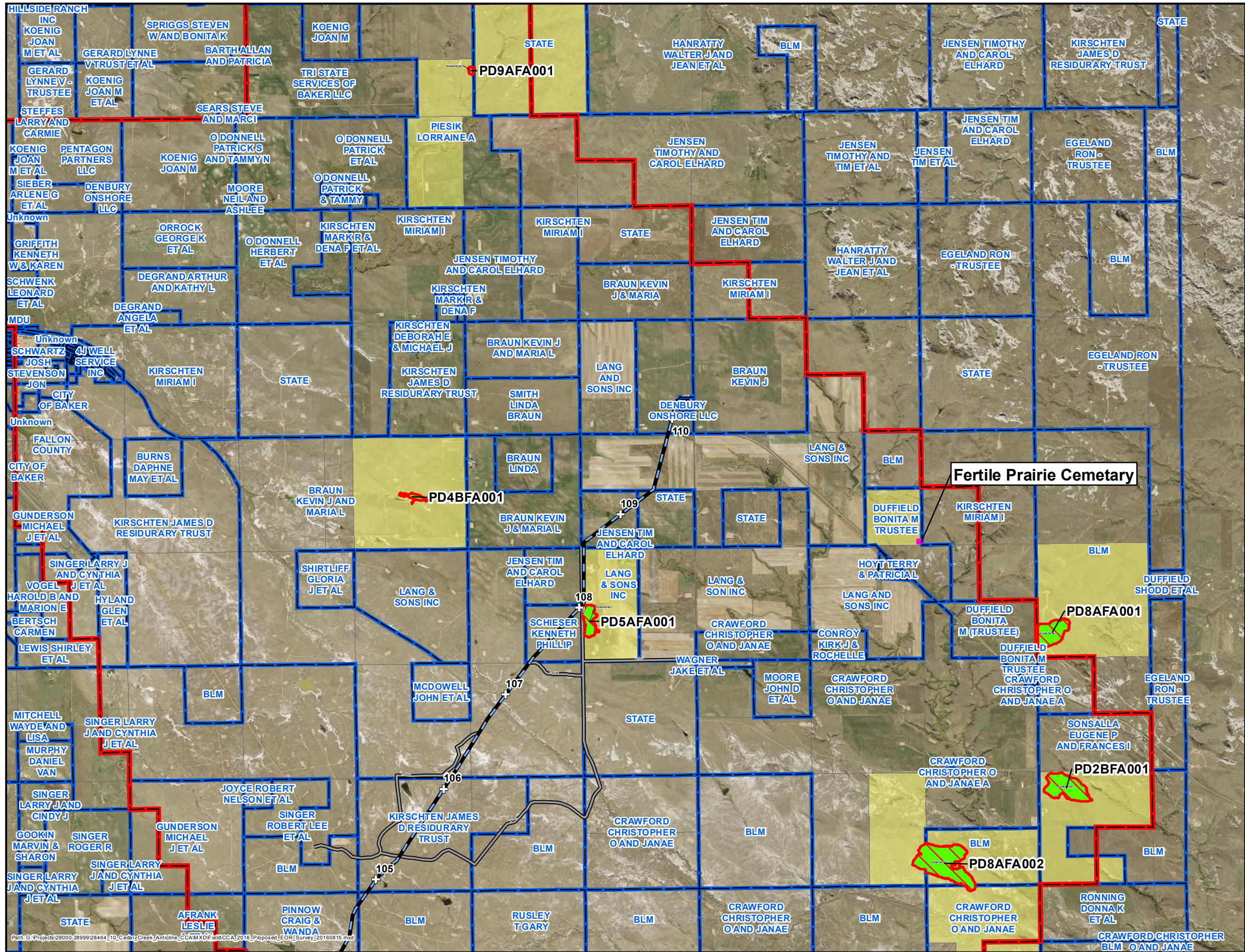
If you have any questions or require any additional information, please contact me at 970-237-4096 or mfuller@swca.com.

Sincerely,



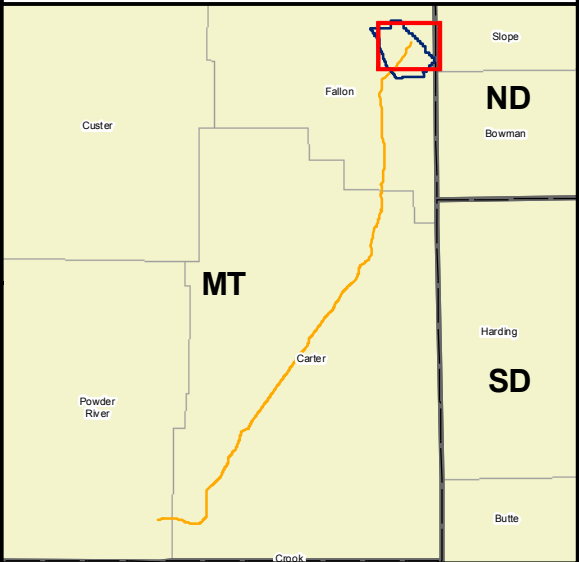
Mac Fuller
Environmental Specialist – SWCA Fort Collins
SWCA Environmental Consultants

Attachments: Overview and site-specific maps of the six black-tailed prairie dog towns.

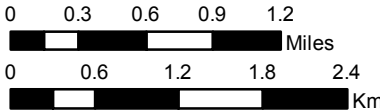


CCA -2016 Proposed Survey Areas

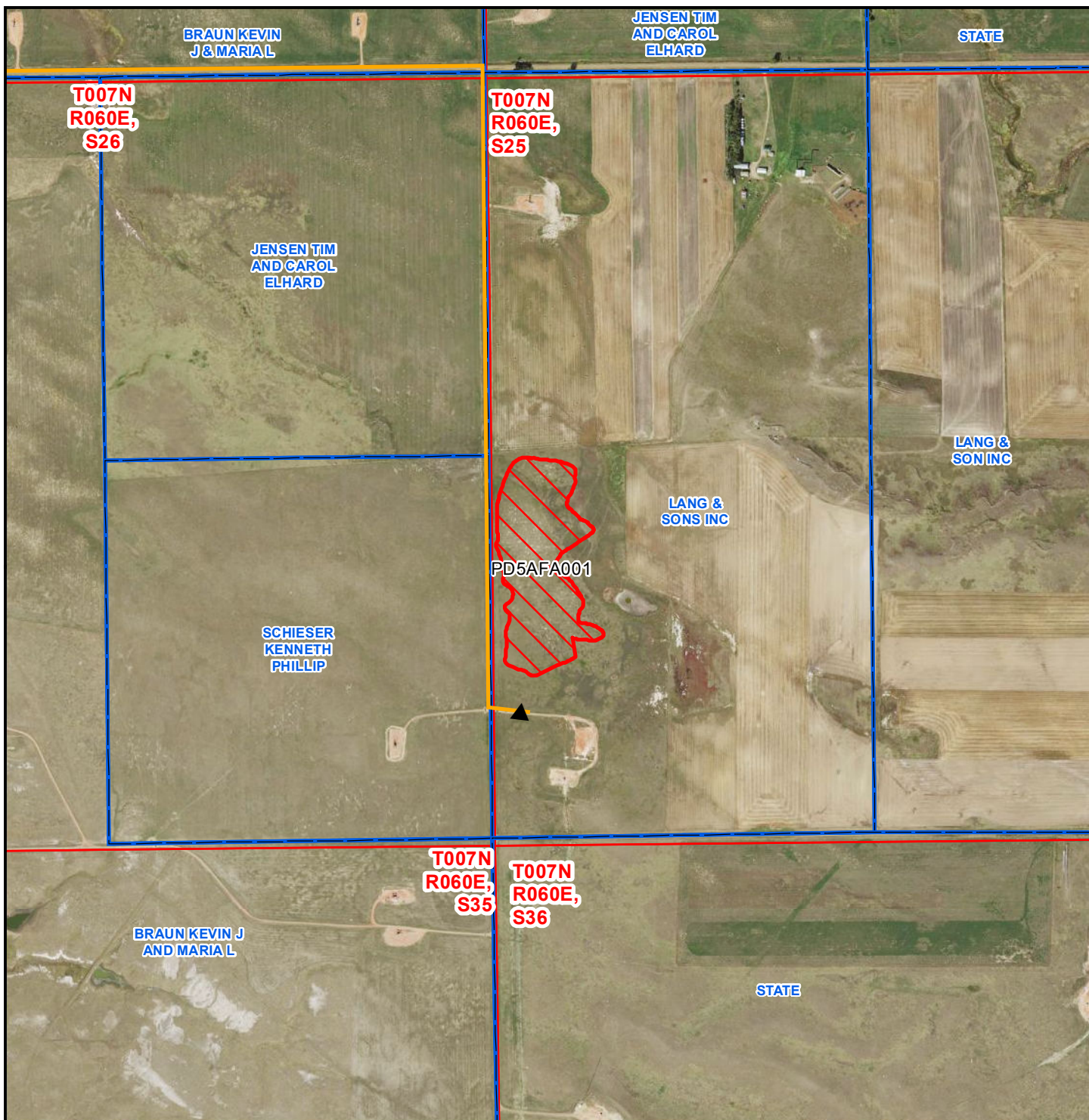
- CR Survey
- NR Survey
- Parcel Requiring Permission
- Milepost
- Proposed Centerline
- Prairie Dog Colony
- Field Development Boundary
- Unimproved Access Road
- Improved Access Road
- Surface Owner



Scale: 1:54,000
Projection: NAD 1983 UTM Zone 13N



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CCA EOR Field - BFF Surveys



Prairie Dog Colony to Survey



Access Route & Parking Location (truck)



Section



Surface Owner

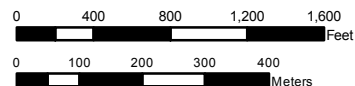


Field Development Boundary

Scale: 1:12,000

Projection: NAD 1983 UTM Zone 13N

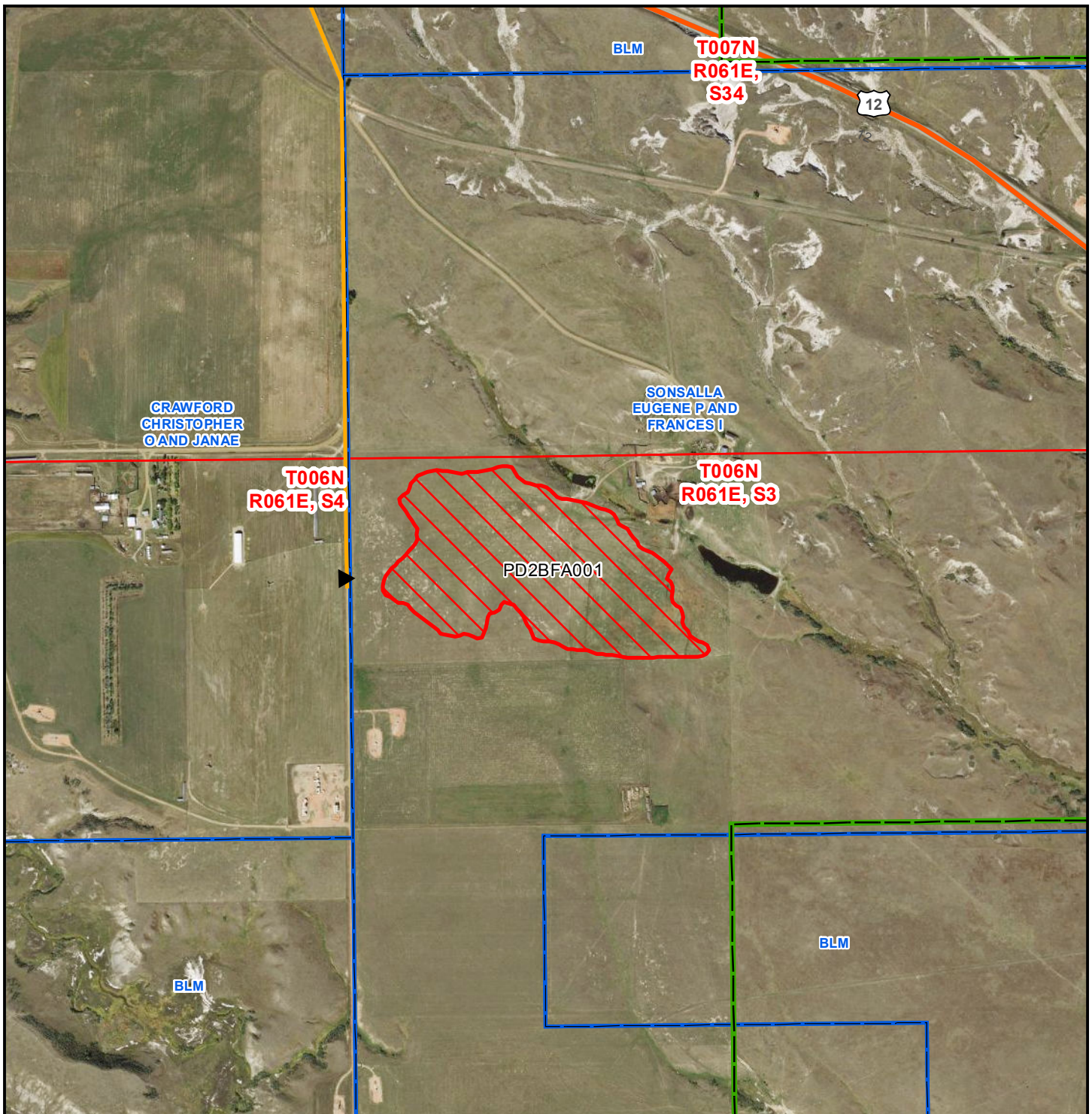
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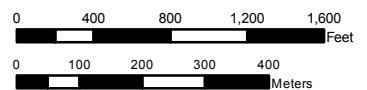


CCA EOR Field - BFF Surveys

-  Prairie Dog Colony to Survey
-  Access Route & Parking Location (truck)
-  Section
-  Surface Owner
-  Field Development Boundary

Scale: 1:12,000
Projection: NAD 1983 UTM Zone 13N

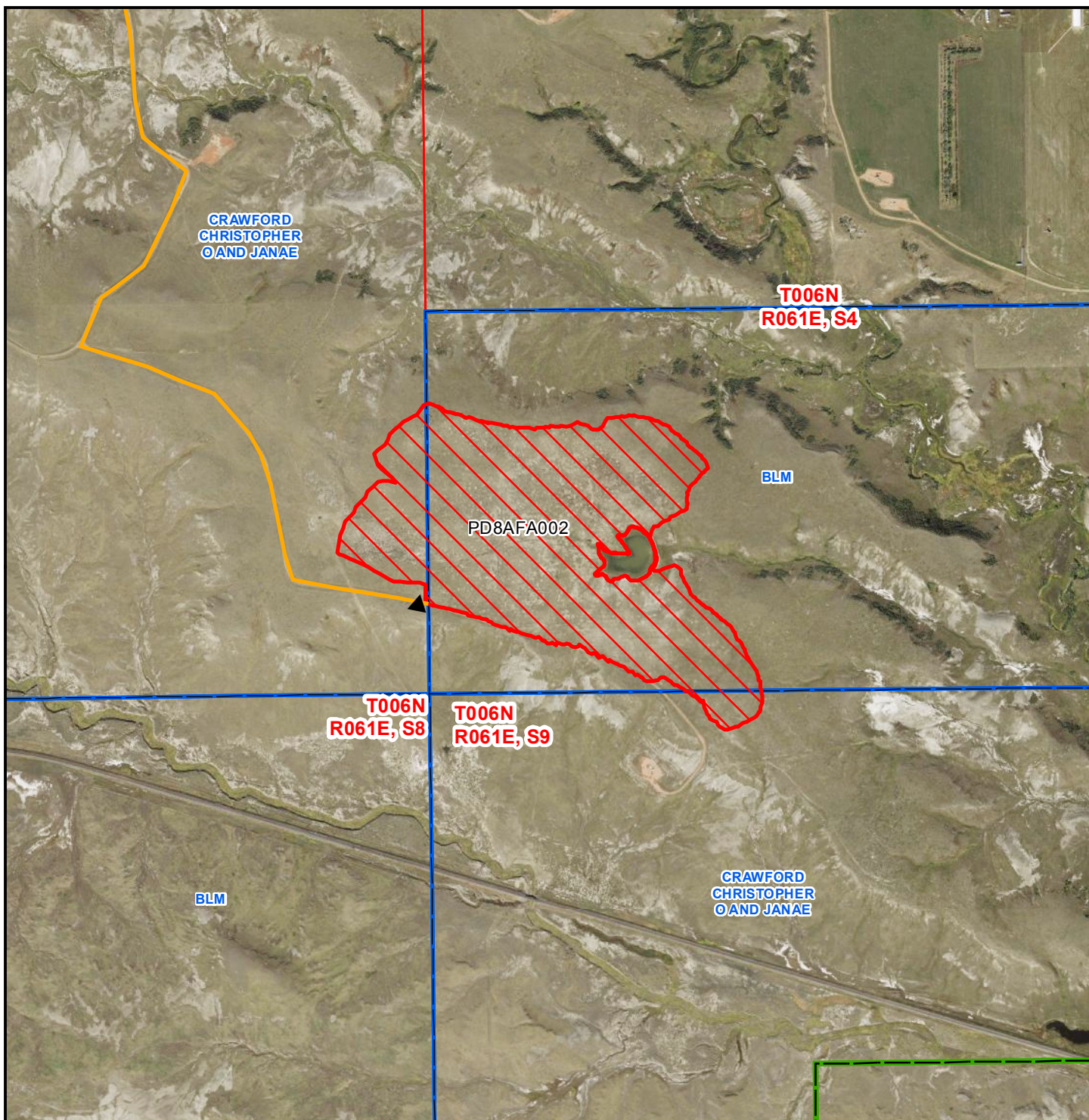
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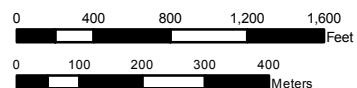


CCA EOR Field - BFF Surveys

-  Prairie Dog Colony to Survey
-  Access Route & Parking Location (truck)
-  Section
-  Surface Owner
-  Field Development Boundary

Scale: 1:12,000
Projection: NAD 1983 UTM Zone 13N

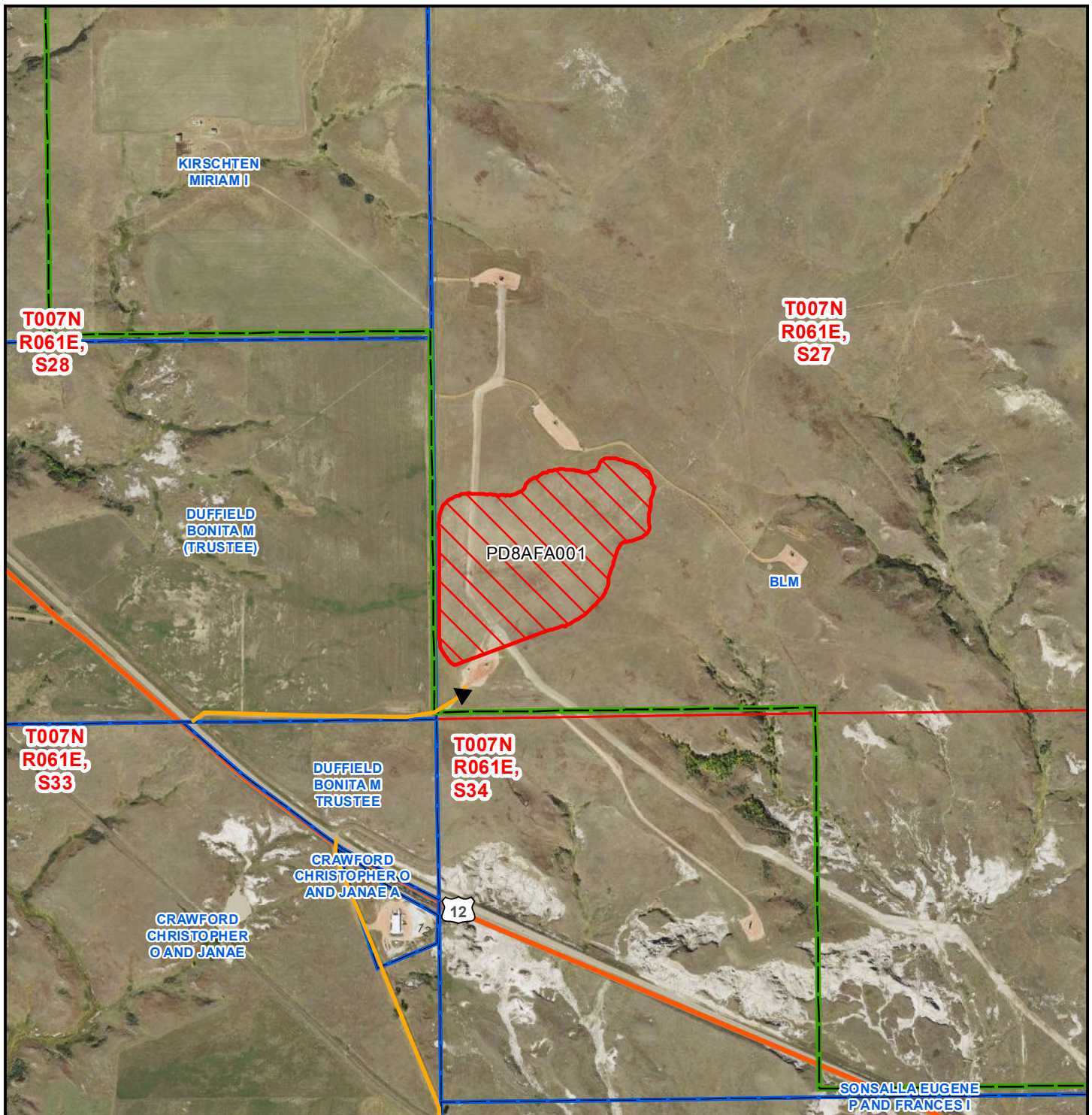
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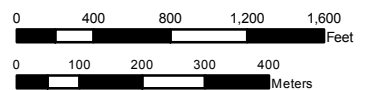


CCA EOR Field - BFF Surveys

-  Prairie Dog Colony to Survey
-  Access Route & Parking Location (truck)
-  Section
-  Surface Owner
-  Field Development Boundary

Scale: 1:12,000
Projection: NAD 1983 UTM Zone 13N

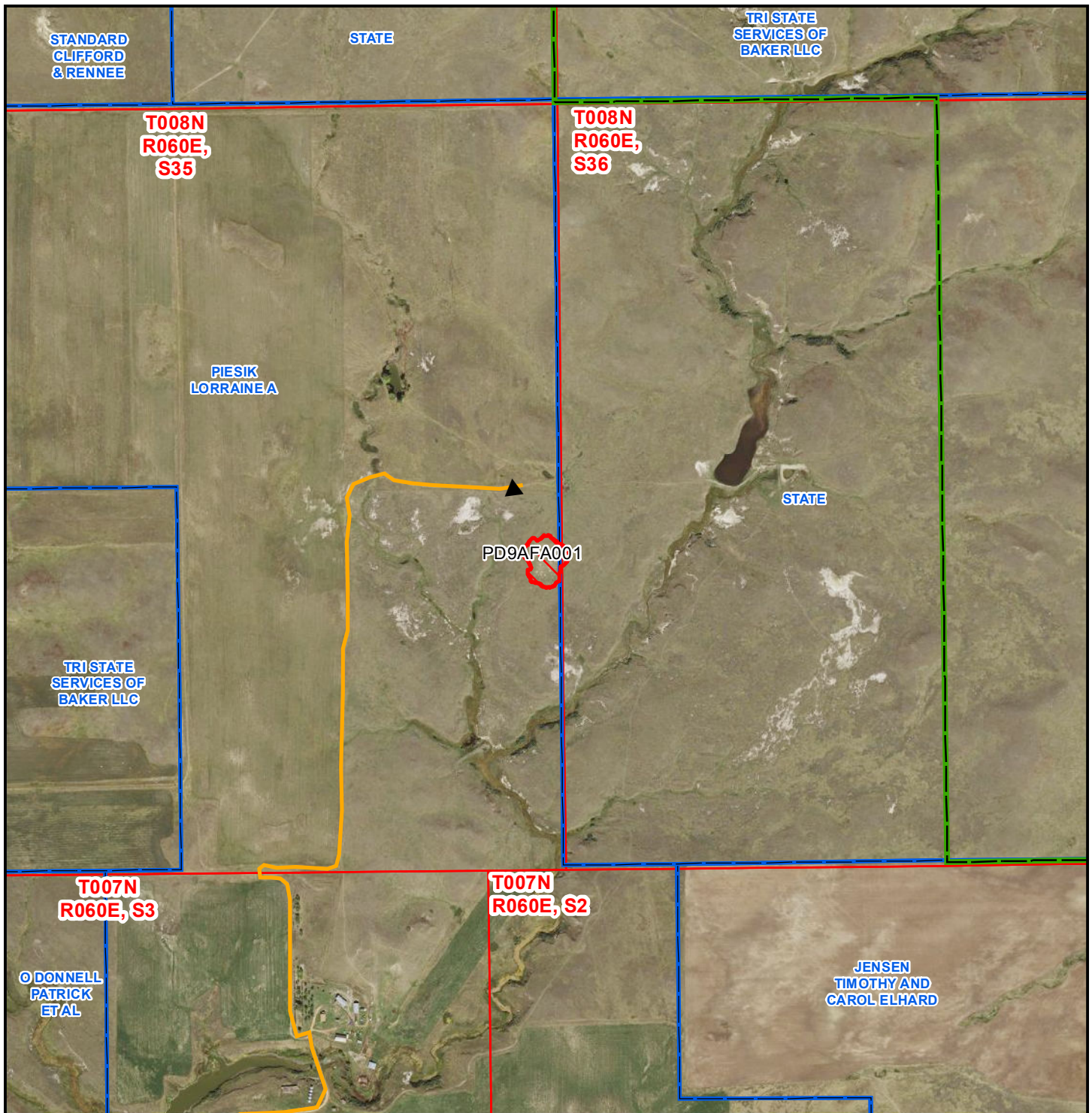
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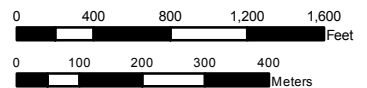


CCA EOR Field - BFF Surveys

-  Prairie Dog Colony to Survey
-  Access Route & Parking Location (truck)
-  Section
-  Surface Owner
-  Field Development Boundary

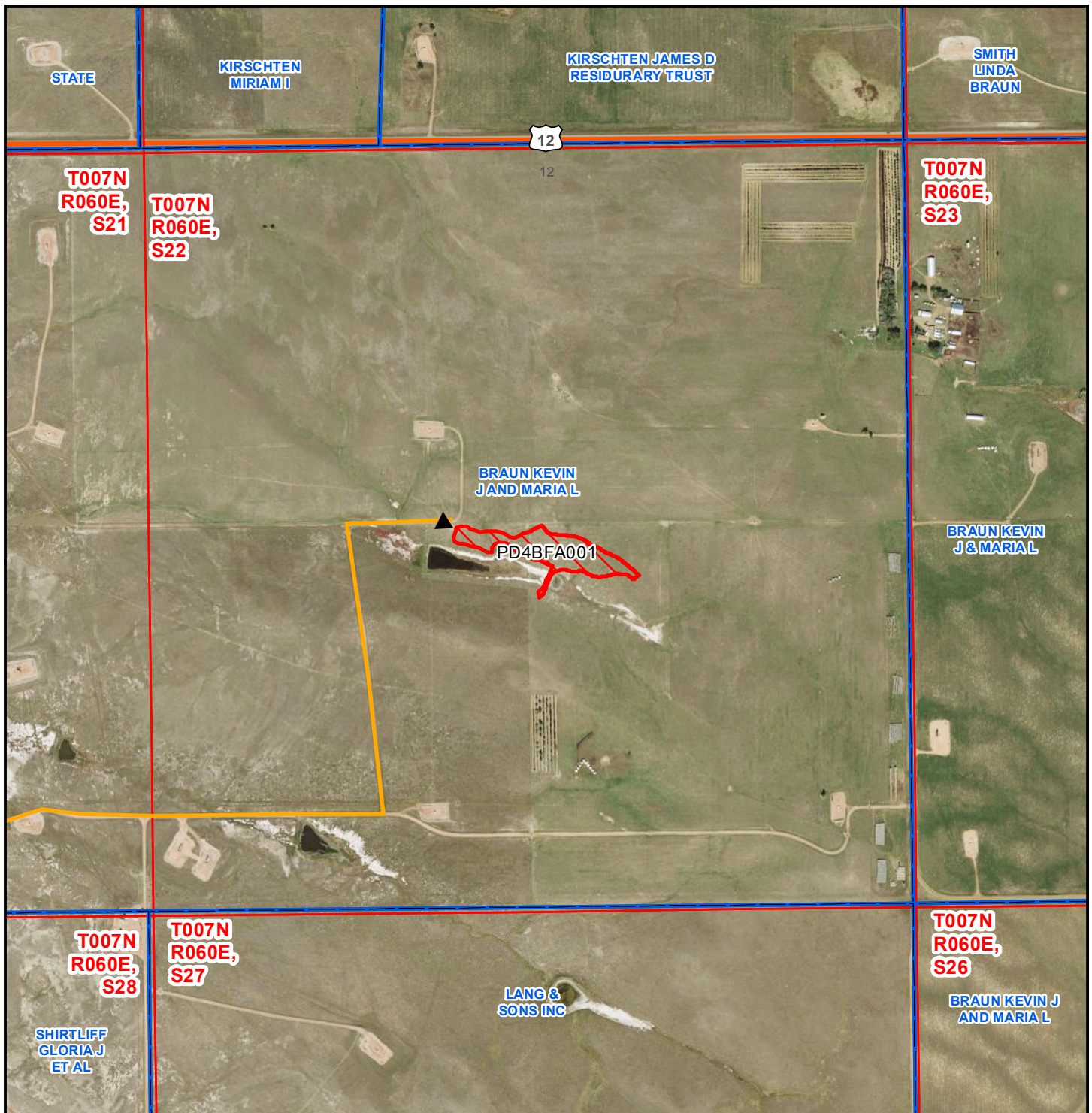
Scale: 1:12,000
Projection: NAD 1983 UTM Zone 13N

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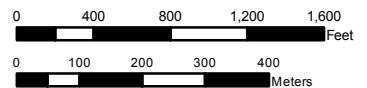


CCA EOR Field - BFF Surveys

-  Prairie Dog Colony to Survey
-  Access Route & Parking Location (truck)
-  Section
-  Surface Owner
-  Field Development Boundary

Scale: 1:12,000
Projection: NAD 1983 UTM Zone 13N

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ATTACHMENT 7
Resumes

DAVID ACKERMAN, B.S., WILDLIFE BIOLOGIST / ENVIRONMENTAL SPECIALIST

As a wildlife biologist, Mr. Ackerman carries out biological surveys for species of concern, threatened, and endangered status per federal guidelines for energy development activities. He also collects scientific data to write detailed reports and provides guidance for project activities following federally mandated direction.

In the past, he has developed Access databases for raptors, sage grouse, eagles, lands division, and survey division; assisted with vegetation baseline sampling and reclamation planning; and conducted stormwater pollution prevention plan inspections for oil and gas development and Spill, Prevention, Control and Countermeasure inspections and reporting. Mr. Ackerman has extensive experience with the Wyoming Game & Fish Department in the Fish Culture Section. He has previous experience as a Fish Hatchery Superintendent for 17 years, Assistant Superintendent for 12 years, and as a Fish Culturist for 3 years at six different stations.

YEARS OF EXPERIENCE

40

EXPERTISE

Data collection, reporting, and guidance for oil and gas developments

Field surveys and habitat assessments (raptors, sage grouse, mountain plovers, bald eagles, and general wildlife)

Development planning, leadership development, budgeting, production planning

EDUCATION

B.S., Zoology; University of Wyoming; 1977

A.S., Wildlife Management; Casper College, Casper, Wyoming; 1975

TRAINING

Autocad Civil 3D, Western Land Services; 2013

Leadership Development, Wyoming Game & Fish Department; 1991-2008

AWARDS / HONORS

Max Rollefson Award

Peer Recognition Award

MEMBERSHIPS

President, Wyoming Public Employees Association; 1982

SELECTED PROJECT EXPERIENCE (* denotes project experience prior to SWCA)

Cedar Creek Anticline Pipeline and Enhanced Oil Recovery Development Project; Wyoming and Montana; Denbury Onshore, LLC. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline (CCA) Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the CCA as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit.) Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single National Environmental Policy Act document. *Role: Environmental Specialist. As lead biologist, recorded wildlife data, performed wildlife target point assessment, geographic information system input, and wetland delineations.*

Big Metal Coal Soil and Vegetation Surveys; Decker, Big Horn County, Montana; Cloud Peak Energy Resources LLC. SWCA conducted wetland, soils, and vegetation baseline surveys. *Role: Environmental Specialist. Conducted vegetation line-point intercept surveys and wetland delineations.*

Golden Grizzly Cultural and Natural Surveys; Converse County, Wyoming; SM Energy Company. SWCA is providing natural and cultural resource services and permitting support for approximately 75 proposed federal wells, flow lines, and associated infrastructure for oil exploration and extraction from the Niobrara Formation in eastern Wyoming. SWCA conducted field surveys, monitored protected resources as required, and wrote technical reports in support of federal permitting. *Role: Environmental Specialist. Contributed to report for wildlife surveys.*

Vermilion Energy East Finn Project; Confidential County, Wyoming; Vermilion Energy USA, LLC. SWCA conducted a pre-field analysis of existing data (e.g. geologic map review, previous locality search, literature review), field surveys, fossil collection; communicated and consulted with federal agencies (e.g. U.S. Forest Service and Bureau of Land Management); and completed survey reports, which summarized the pre-field and field results and included recommendations for the construction phase of the project. *Role: Environmental Specialist. Wrote draft Biological Resource Report, reviewed report revisions.*

***Coalbed Natural Gas Plan of Development; Wyoming; WPX Energy.** Total wildlife ground survey and assessment for an oil and gas development *Role: Lead biologist. Reported to federal agencies and provided project guidance based on federal guidelines for wildlife buffers.*

NATE ALLEY, M.S., GIS SPECIALIST

Mr. Alley is a geographic information specialist (GIS) Specialist who is responsible for working with the cultural, paleontological, and natural resource departments to manage spatial data for specific projects and cartographical requirements. He has 12 years of experience developing and maintaining report maps and data for land use planning by natural gas and oil developers, and federal organizations including the Bureau of Land Management (BLM) and the State Historic Preservation Office in Wyoming, North Dakota, Colorado, Utah and Idaho. Additional technical expertise includes ESRI ArcGIS Suite 10.2, ArcPad 10, Microsoft Office Suite, Adobe Acrobat, Trimble GeoXt, Garmin, Magellan GPS receivers for field data collection and processing.

YEARS OF EXPERIENCE

12

EXPERTISE

GIS support, analysis, setup, and use

Report mapping

Geodatabase design

Field data collection

Cartography

Spatial analyst

ArcGIS proficiency

Raster analysis

EDUCATION

M.S., Forestry; GIS/Remote Sensing;
Colorado State University, Fort Collins,
Colorado; 2003

B.S., Natural Resource Management;
Colorado State University, Fort Collins,
Colorado; 2001

B.A., Visual Communications/Design;
Southern Illinois University, Carbondale,
Illinois; 1994

TRAINING

Heart Saver First Aid and CPR,
Colorado CPR - Bison Center; 2014

Trimble System Training Advanced
TerraSync, Electronic Data
Solutions/Trimble; 2007

Field GPS Use - 16 Hours., South
Dakota School of Mine and Technology;
2013

SELECTED PROJECT EXPERIENCE

Greencore Pipeline; Natrona County, Wyoming; AECOM, Inc. / Denbury Resources, Inc. SWCA is conducting cultural resources investigations for permitting for Denbury's Greencore CO₂ Pipeline Project, which delivers compressed CO₂ from the Lost Cabin gas processing plant in central Wyoming to the Bell Creek oil field in southeast Montana. In addition to construction monitoring and pre-construction data recovery, SWCA conducted data recovery excavations at three prehistoric archaeological sites in 2014 post-construction mitigation. *Role: GIS Specialist. Responsible for cultural resource report mapping, global positioning system (GPS) field data processing, spatial data management and ancillary data support.*

Bell Creek Enhanced Oil Recovery Development Project; Powder River County, Wyoming; Denbury Resources, Inc. SWCA continues to consult with the BLM Miles City Field Office regarding avoidance and mitigation strategies for known biological, cultural, and paleontological features that SWCA crews identified in an enhanced oil recovery (EOR) project area at the existing Bell Creek oil field in Powder River and Carter Counties, Montana. The EOR development will occur in nine phases, and construction is planned to be completed in all nine phases by 2020. Project-related tasks for SWCA include field surveys, monitoring during construction, reporting, and routing support for all nine phases of the project. SWCA continues to provide Environmental Inspection services, including stormwater permitting and inspections as required by the Montana Department of Environmental Quality, during construction. SWCA is also monitoring the entire project area for noxious weeds, and coordinating weed spraying as required. *Role: GIS Specialist. All aspects of GIS database management, mapping for paleontological, cultural, and natural resources, client data coordination, and correspondence for any GIS-related tasks.*

Big Metal Project Cultural and Natural Resources Surveys; Big Horn County, Montana; Confidential. In 2013 SWCA, in conjunction with the Crow Tribal Historic Preservation Office conducted a Class III Cultural Resource Inventory of 57 exploratory drill locations and associated access routes for the Cloud Peak Big Metal project. In all 2,179 acres were surveyed including 45 miles of proposed access roads. Fieldwork continued in 2014 for the remaining drill hole locations (roughly 35) and associated access routes. *Role: GIS Specialist. Responsible for cultural and natural resource report mapping, GPS field data processing, spatial data management and ancillary data support.*

Bear Den Pipeline Paleontological Resources; McKenzie County, North Dakota; Natural Resource Group, LLC. As a third-party consultant, SWCA conducted paleontological pedestrian surveys, developed construction employee training material, a monitoring/mitigation plan, and conducted monitoring for paleontological resources during construction for the CenterPoint Energy Bakken Crude Services, LLC gathering pipeline

system. This system was designed to eliminate tanker truck activity on public and private roads and consists of approximately 68.5 miles of crude oil buried pipeline and 59.4 miles of produced water buried pipeline. *Role: GIS Specialist. Responsible for paleontological resource report mapping, GPS field data processing, spatial data management and ancillary data support.*

Cedar Creek Anticline Pipeline and EOR Development Project; Multiple Counties, Wyoming; Denbury Onshore, LLC. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline Pipeline and EOR Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the Cedar Creek Anticline as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit). Permitting includes applying for a generic Application for Permit to Drill (APD) that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single National Environmental Policy Act document. *Role: GIS Specialist. Provided full GIS support, data management and mapping products for operations planning and environmental resource inventories.*

Denbury Bell Creek APD Permitting; Belle Creek, Grieve, Multiple States; Denbury Onshore, LLC. SWCA is preparing federal and state APD packages for approximately 30 oil and CO₂ injection wells in Denbury's Bell Creek Field and is following them through to approval in conjunction with SWCA's cultural, paleontological, wetland and sensitive species resource work. *Role: GIS Specialist. Responsible for cultural and paleontological resource report mapping, GPS field data processing, spatial data management and ancillary data support.*

Denbury Bell Creek EOR Resource Support; Belle Creek, Powder River County, Montana; AECOM, Inc. SWCA conducted Class I and Class III investigations for an EOR and CO₂ sequestration project covering approximately 20,000 acres parceled into 9 development phases spanning 2010–2015. *Role: GIS Specialist. Responsible for cultural and paleontological resource report mapping, GPS field data processing, spatial data management and ancillary data support.*

DKRW Pipeline; Carbon County, Wyoming; AECOM, Inc. The DKRW pipeline is a 107-mile-long lateral CO₂ pipeline to the Riley Ridge Pipeline in Carbon, Sweetwater, and Fremont Counties, Wyoming. Services have included cultural resource surveys and reporting, tribal consultation, and Programmatic Agreement development. *Role: GIS Specialist. Responsible for cultural resource report mapping, GPS field data processing, spatial data management and ancillary data support.*

Riley Ridge to Natrona Pipeline; Multiple Counties, Wyoming; Denbury Resources, Inc. / AECOM, Inc. SWCA began providing cultural and natural resource services for a 243-mile CO₂ pipeline in central Wyoming in 2012 and continues to provide these services through all phases of the project up to its completion. Tasks include field surveys, preparation of environmental and cultural resources documentation in support of BLM right-of-way grant application and Clean Water Act Section 404 permitting and Endangered Species Act compliance. *Role: GIS Specialist. All aspects of GIS database management, mapping for paleontological, cultural, and natural resources, client data coordination, and correspondence for any GIS-related tasks.*

Riley Ridge Unit Development; Multiple Counties, Wyoming; Denbury Resources, Inc. SWCA performed natural and cultural resource surveys on BLM lands as part of Denbury's proposed project in the Riley Ridge Unit in the LaBarge Anticline oil and gas field located in southwest Sublette County, Wyoming. Tasks included field surveys, preparation of environmental and cultural resources documentation in support of BLM right-of-way grant application, Clean Water Act Section 404 permitting, and Endangered Species Act compliance. *Role: GIS Specialist. All aspects of GIS database management, mapping for paleontological, cultural, and natural resources, client data coordination, and correspondence for any GIS-related tasks.*

CHAD BARNES, B.S., SENIOR PROJECT MANAGER / ENVIRONMENTAL INSPECTIONS PROGRAM MANAGER

Mr. Barnes has over 20 years of experience in project management of multidisciplinary environmental studies, environmental inspections, habitat analysis, wetland delineations, land use characterizations and mapping, technical writing and editing, and wetland mitigation (design, monitoring, planting, and maintenance). He has extensive experience in managing and coordinating large-scale field programs for linear projects across the country. Mr. Barnes has experience managing and coordinating the preparation of Federal Energy Regulatory Commission (FERC) Resource Reports for natural gas pipeline projects, and has been intensively involved in seeing them from inception (preliminary routing) through construction (right-of-way monitoring). He also has managed the preparation of FERC third-party environmental impact statements, environmental assessments, and Biological Assessments (BAs) for the Bureau of Land Management (BLM). In addition, he has considerable experience in field surveys for sensitive species, including gopher tortoise, Eastern indigo snakes, sand skinks, desert tortoise, burrowing owls, scrub jays, raptors, greater sage-grouse, and Ute ladies'-tresses orchid.

YEARS OF EXPERIENCE

20

EXPERTISE

EHS Compliance Audits

Project Quality Assurance/Quality Control

Program Management for Project Permitting

Environmental Inspection during Pipeline Construction

Impact Mitigation Planning

Lake Investigation & Management

Wetland and waterbody delineations

Site, Stream & Wetland Restoration

Major Capital Permitting Projects

Environmental Impact Assessments & Statements

Baseline & Benchmark Field Studies

Federal, State, Province & Local Regulatory Interface & Negotiation

Natural Resources Management

Project Feasibility, Siting & Planning

EDUCATION

B.S., Botany; University of Arizona; Tucson, Arizona; 1996

SELECTED PROJECT EXPERIENCE

Cedar Creek Anticline Pipeline and Enhanced Oil Recovery Development Project; Wyoming and Montana; Denbury Onshore, LLC. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline (CCA) Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the CCA as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit). Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single National Environmental Policy Act document. *Role: Project Manager. Responsible for managing all aspects of the field program (natural, cultural, and paleontological surveys and reports), development and submittal of the Plan of Development, Environmental Report, BA, and Special Status Species Report. Also responsible for all agency and client interactions.*

Bell Creek EOR Development Project; Powder River County, Wyoming; Denbury Resources, Inc. SWCA continues to consult with the BLM Miles City Field Office regarding avoidance and mitigation strategies for known biological, cultural, and paleontological features that SWCA crews identified in an EOR project area at the existing Bell Creek oil field in Powder River and Carter Counties, Montana. The EOR development will occur in nine phases, and construction is planned to be completed in all nine phases by 2020. Project-related tasks for SWCA include field surveys, monitoring during construction, reporting, and routing support for all nine phases of the project. SWCA continues to provide Environmental Inspection services, including stormwater permitting and inspections as required by the Montana Department of Environmental Quality, during construction. SWCA is also monitoring the entire project area for noxious weeds, and coordination will be conducted for weed spraying as required. *Role: Project Manager. Responsible for managing all aspects of the field program (natural, cultural, and paleontological surveys and reports), development and submittal of the Plan of Development, Environmental Report, BA, and Special Status Species reports. Also responsible for all agency and client interactions.*

Greencore CO₂ Pipeline Project; Multiple Counties, Wyoming; Denbury Resources, Inc. SWCA consulted with the BLM Casper Field Office regarding avoidance and mitigation

TRAINING

USACE Wetland Delineation
Methodology Course; 1997

Soil Survey Workshop, Duval County;
1999

FERC Report Preparation and Post-
certificate Environmental Compliance
Seminars; 2003, 2004

Mine Safety Health Administration
(MSHA) Certification Course, Mine
Safety Health Administration; 2000

FDEP Hydric Soils Training Course;
1997

Plant identification seminars

Wetlands Delineation Certification, U.S.
Army Corps of Engineers

Soil Conservation Service Hydric Soils
Training Course; 1999

AWARDS / HONORS

National Safety Award for the
Greencore CO2 Pipeline Project

MEMBERSHIPS

Member, National Association of
Environmental Professionals (NAEP)

Member, Colorado Native Plant Society

Member, Society of Wetland Scientists

strategies for known biological, cultural, and paleontological features that SWCA crews identified in the project area for a 231-mile-long CO₂ pipeline between the ConocoPhillips Lost Cabin Gas Plant in Fremont County, Wyoming, and a point in the Bell Creek oil field in Powder River County, Montana. The CO₂ transported by the pipeline will be used for EOR at the existing Bell Creek oil field. SWCA is responsible for monitoring the entire project area for noxious weeds, and coordination will be conducted for weed spraying as needed. SWCA is also conducting the fieldwork, reporting, and agency consultation for the annual post-construction right-of-way monitoring until success criteria have been met. *Role: Project Manager. Responsible for managing all aspects of the field program (natural, cultural, and paleontological surveys and reports), development and submittal of the Plan of Development, Environmental Report, BA, and Special Status Species Report. Also responsible for all agency and client interactions.*

Riley Ridge to Natrona Pipeline; Multiple Counties, Wyoming; Denbury Resources, Inc.

SWCA began providing cultural and natural resource services for a 243-mile CO₂ pipeline in central Wyoming in 2012 and will continue to provide these services through all phases of the project up to its completion. Tasks include field surveys, preparation of environmental and cultural resources documentation in support of BLM right-of-way grant application and Clean Water Act Section 404 permitting and Endangered Species Act compliance. *Role: Project Manager. Responsible for managing all aspects of the field program (natural, cultural, and paleontological surveys and reports), development and submittal of the Plan of Development, Environmental Report, BA, and Special Status Species Report. Also responsible for all agency and client interactions.*

Riley Ridge Unit Development; Multiple Counties, Wyoming; Denbury Resources, Inc.

SWCA performed natural and cultural resource surveys on BLM lands as part of work for Denbury's proposed project in the Riley Ridge Unit in the LaBarge Anticline oil and gas field. Tasks included field surveys, preparation of environmental and cultural resources documentation in support of BLM right-of-way grant application, Clean Water Act Section 404 permitting, and Endangered Species Act compliance. *Role: Subject Matter Expert / Project Manager. Responsible for managing all aspects of the field program (natural, cultural, and paleontological surveys and reports), development and submittal of the Plan of Development, Environmental Report, BA, and Special Status Species Report. Also responsible for all agency and client interactions.*

RYAN BARNHILL, B.A., ENVIRONMENTAL SPECIALIST

Mr. Barnhill is an environmental specialist with experience in natural and cultural resources and an emphasis in wetland delineations following the 1987 *U.S. Army Corps of Engineers (USACE) Wetland Delineation Manual* throughout Pennsylvania, Ohio, West Virginia, Colorado, New Mexico and Texas. He has provided consultation for environmental regulation/compliance on projects including Marcellus/Utica well and pipeline installations. Mr. Barnhill possesses an in depth understanding of the National Environmental Policy Act (NEPA), Clean Water Act (CWA), USACE Nationwide Permit 12 compliance, and U.S. Fish and Wildlife Service Threatened and Endangered Species Act compliance. Additional areas of contribution include Threatened and Endangered Species habitat assessments, and water and soil sampling.

Mr. Barnhill is responsible for technical/scientific reporting suitable for submission to any regulatory authority, including, but not limited to: wetland delineation reports, Endangered Species Habitat Assessment reports and various other environmental compliance and permitting documents. Mr. Barnhill is also responsible for field crew leadership and safety, data quality assurance and quality control (QA/QC) management and equipment maintenance.

YEARS OF EXPERIENCE

5

EXPERTISE

Wetland Delineation
Fish and Plant Identification
Soils Collection and Analysis
Macroinvertebrate Collection
GPS Data Collection
Water Sampling and Discharge
Water Chemistry

EDUCATION

B.A., Environmental Science; University of Pittsburgh; 2014

A.A.S., Natural Resource Management; Colorado Mountain College, Leadville, Colorado; 2009

TRAINING

Certificate in Field Monitoring; 2009

40 hour OSHA/MSHA trained; 2009-2012

Certificate in Geographic Information System; 2009

40 hour Wetland Delineation Course, Ohio University; 2010

CPR/First Aid; 2014

SELECTED PROJECT EXPERIENCE

Cedar Creek Anticline Pipeline and Enhanced Oil Recovery Development Project; Wyoming and Montana; Denbury Onshore, LLC. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline (CCA) Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the CCA as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pannel Unit, the East Lookout Butte Unit, and the Coral Creek Unit.) Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single NEPA document. *Role: Environmental Specialist. Responsibilities included conducting field wetland and stream assessments, habitat evaluations, and data QA/QC.*

Non-Native Species Removal for the City of New Braunfels; New Braunfels, Comal County, Texas; City of New Braunfels. SWCA removed four non-native species from Landa Lake as part of the Edwards Aquifer Authority Habitat Conservation Plan. Species removed include tilapia, sailfin catfish, giant ramshorn snail, and nutria. *Role: Environmental Specialist. Removal efforts of tilapia, vermiculated armored catfish, nutria, and giant rams horn snails.*

Rockies Express East Loop Pipeline Feasibility Study; Multiple Counties, Multiple States; Tallgrass Operations, LLC. SWCA conducted natural resources field investigation efforts on an approximate 300-mile natural gas pipeline project. Tasks included coordination of field efforts between multiple consulting firms, regulatory agency outreach presenting the project, and field efforts. *Role: Environmental Specialist. Conducted field Phase I IBAT, wetland, and stream assessments, QA/QC of data, and report writing.*

RHL 10 Well Pad Development; Greene County, Pennsylvania; Noble Energy, Inc. SWCA conducted a U.S. Fish and Wildlife Service consultation regarding Indiana bat avoidance measures. *Role: Environmental Specialist. Conducted field Phase I IBAT, wetland, and stream assessments, QA/QC of data and report writing.*

Environmental Services for SHL23 and WEB22 Well Pads; Marshall County, West Virginia; Confidential. SWCA conducted field investigations to identify all waters of the U.S. within the limits of disturbance for the construction of a well pad. *Role: Environmental Specialist. Conducted field Phase I IBAT, wetland, and stream assessments, QA/QC of data and report writing.*

DILLON BELISLE, B.S., ENVIRONMENTAL TECHNICIAN

Mr. Belisle is an environmental specialist within SWCA's Bismarck office. He is educated and experienced in ecological disciplines including ornithology, ichthyology, animal behavior, watershed analysis, and conservation biology. Mr. Belisle is also experienced in the delineation of waters of the U.S. according to the requirements of the U.S. Army Corps of Engineers. He has conducted field work for large and small linear and tract delineations and is knowledgeable in wetland vegetation, hydric soil identification, and wetland hydrology.

Mr. Belisle is knowledgeable in avian identification and specializes in the identification of wildlife species including sensitive, threatened, and endangered species. He has completed various threatened and endangered species surveys and is knowledgeable of the habitat requirements of many listed species.

YEARS OF EXPERIENCE

7

EXPERTISE

Endangered Species Act assessments
Migratory Bird Treaty Act assessments and consultations

Bald and Golden Eagle Protection Act assessments and compliance

Stormwater Pollution Prevention Inspections

ArcGIS and Trimble Units

EDUCATION

B.S., Fisheries and Wildlife Biology;
University of North Dakota; 2012

TRAINING

Defensive Driving Course; 2012

MOCC Motor Boat Training Module; 2012

S-212 Wildland Fire Chain Saws; 2009

Aviation Training; 2009

OSHA 10-hour General Industry; 2013

North Dakota Commercial Chemical Application; 2012

Avian Influenza Hands-On Training; 2009

H2S Awareness Certification; 2014

Wildland Fire Behavior S-190 and S-130; 2009

SELECTED PROJECT EXPERIENCE

Cedar Creek Anticline Pipeline and Enhanced Oil Recovery Development Project; Multiple Counties, Wyoming; Denbury Onshore, LLC. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the Cedar Creek Anticline as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit). Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single National Environmental Policy Act (NEPA) document. *Role: Environmental Technician. Conducted wetland delineations.*

AE2S Killdeer Wetland Delineation; Dunn County, North Dakota; Advanced Engineering and Environmental Services, Inc. SWCA performed wetland delineations according to U.S. Army Corps of Engineers standards. *Role: Environmental Technician. Conducted wetland delineations and prepared wetland reports.*

Big Metal Project Cultural and Natural Resources Surveys; Big Horn County, Montana; Confidential. In 2013 SWCA, in conjunction with the Crow Tribal Historic Preservation Office conducted a Class III Cultural Resource Inventory of 57 exploratory drill locations and associated access routes for the Cloud Peak Big Metal project. In all 2,179 acres were surveyed including 45 miles of proposed access roads. Fieldwork is ongoing in 2014 for the remaining drill hole locations (roughly 35) and associated access routes. *Role: Environmental Technician. Conducted invasive weed identification surveys.*

North Dakota Permitting and NEPA Compliance; Dunn County, North Dakota; Enerplus Resources. SWCA conducted general wildlife and vegetation field surveys, with an emphasis on migratory birds and raptors, for oil and gas development in North Dakota. Additionally, SWCA was responsible for ensuring environmental compliance and preparing environmental assessments and other NEPA documents. *Role: Environmental Technician. Conducted migratory bird surveys.*

Lonesome Creek NGL and Cherry Creek to Lonesome Creek Cultural and Natural Services; McKenzie County, North Dakota; E3 Environmental, LLC. The project consisted of two pipelines, one 7.6-miles-long and one 3.97-miles-long. Both projects entailed Class I and Class III inventories and reports submitted to the client to successfully apply for a North Dakota Public Service Commission permit. *Role: Environmental Technician. Conducted*

natural resource field surveys and prepared reports.

ONEOK Lost Bridge Pipeline Tribal and USFS Lands; McKenzie County, North Dakota; E3 Environmental, LLC. SWCA conducted natural and cultural resource surveys and reporting for tribal lands and U.S. Forest Service along the proposed Lost Bridge pipeline route. *Role: Environmental Technician. Conducted field work.*

Sacagawea Pipeline; Multiple Counties, North Dakota; Paradigm Energy Partners, LLC. SWCA conducted natural resource surveys for a pipeline project and associated gathering lines on private and U.S. Forest Service lands. *Role: Environmental Technician. Conducted natural resource field surveys and prepared reports.*

Samson Divide County Wetland Delineation Services; Divide County, North Dakota; Samson Resources Company. SWCA conducted wetland delineations on a proposed access road for oil and gas development. The project was located in the prairie pothole area of Divide County. *Role: Environmental Specialist. Conducted fieldwork and prepared reports.*

WPX Energy Williston, LLC; Mandaree, McKenzie County, North Dakota; WPX Energy Williston, LLC. SWCA has been contracted on an "on-call" basis to conduct natural and cultural resource surveys, prepare environmental assessments, environmental assessment addendums, cultural resource reports, and any other documentation or surveys as required by NEPA, the Bureau of Indian Affairs, or other pertinent agencies, as well as provide informal consultations with the U.S. Fish and Wildlife Service. *Role: Environmental Technician. Conducted Section 10 field work, and prepared avian survey letter and natural resources report.*

USG Flickertail Reroutes and DeWitt Well Connects; Divide County, North Dakota; NextEra Energy Resources, LLC. SWCA conducted natural and cultural resource and due diligence surveys, as well as easement record searches, for approximately 58 miles of well connects. *Role: Environmental Specialist. Conducted fieldwork and prepared wetland reports.*

Williams County Threatened & Endangered Bird Surveys; Williams County, North Dakota; Confidential. SWCA conducted bird and nest surveys for least tern, piping plover, and sighting survey for the whooping crane. *Role: Environmental Technician. Conducted natural resource field surveys and prepared reports.*

Flickertail Natural Gas Pipeline Resource Surveys; Divide County, North Dakota; Confidential. SWCA conducted natural and cultural resource field surveys and reporting for an approximately 82-mile pipeline. *Role: Environmental Specialist. Conducted fieldwork and prepared reports.*

EOG North Dakota and Montana Permitting Support; McLean County, North Dakota; EOG Resources, Inc. SWCA has provided ecological and cultural field investigations and environmental assessment preparation for energy development on the Fort Berthold Reservation. *Role: Environmental Technician. Conducted surveys on well pad sites.*

Divide Pump Station Natural and Cultural Services; Divide County, North Dakota; E3 Environmental, LLC. SWCA provided cultural and natural resource surveys to satisfy North Dakota Public Service Commission requirements. *Role: Environmental Technician. Conducted fieldwork and wetland determinations.*

AE2S- Williston 11th Street Crossing Wetland Delineation; Williams County, North Dakota; Advanced Engineering and Environmental Services, Inc. SWCA performed wetland delineations according to U.S. Army Corps of Engineers standards. *Role: Environmental Technician. Conducted wetland delineations and prepared wetland reports.*

Arrow Pipeline Services; Dunn County, North Dakota; Arrow Midstream Holdings, LLC. SWCA has been contracted on an "on-call" basis to conduct natural and cultural resource surveys, prepare environmental assessments, environmental assessment addendums, cultural resource reports, and any other documentation or surveys as required by NEPA, the Bureau of Indian Affairs, or other pertinent agencies. *Role: Environmental Technician. Conducted field work, prepared reports, and provided data collection.*

Little Muddy Creek Cultural and Natural Services; Williams County, North Dakota; E3 Environmental, LLC. SWCA provided cultural and natural resource surveys for a proposed 14.5-mile pipeline. *Role: Environmental Technician. Conducted natural resource field surveys.*

Oxy Russian Creek Environmental Surveys; Dunn County, North Dakota; Oxy USA, Inc. SWCA conducted cultural and natural resource surveys in support of Oxy Russian Creek Gathering System. *Role: Environmental Technician. Conducted natural resource field surveys and prepared reports.*

BOB CAWTHERN, PWS, SENIOR NATURAL RESOURCE SCIENTIST

Mr. Cawthern has 28 years of experience performing wetland delineations and related tasks throughout New England, southern plains and extensively throughout the Mid-Atlantic states. Responsibilities include wetland delineations, Section 404/401 permit preparation, botanical surveys, habitat evaluations for threatened and endangered species, stream assessments, wetland functional assessments, wetland mitigation design, implementation and monitoring and coordination of project activities with various regulatory agencies. Projects included residential, commercial, industrial, government and the natural gas and oil industry in Wyoming, Pennsylvania, Ohio, Utah and West Virginia.

With extensive experience in aquatic resource management, he has prepared technical reports and aquatic resource sections for numerous environmental reports. He has particular expertise in functional assessment methodology for use in State and Federal permitting and in forensic delineations on disturbed sites.

YEARS OF EXPERIENCE

28

EXPERTISE

Wetland and stream delineation and functional assessment

Botanical inventories and endangered plant surveys

Forensic wetland delineations on disturbed sites

EDUCATION

B.S. cum laude, Agronomy; Delaware Valley College of Science & Agric., Doylestown, PA; 1982

REGISTRATIONS / CERTIFICATIONS

Registered Professional Wetland Scientist; Society of Wetland Scientists; 2001

TRAINING

40 hours Habitat Evaluation Procedures, Colorado State University

38 hours Wetland Delineation Training, U.S. Army Corps of Engineers

40 hours Hydric Soils Identification, North Carolina State University

80 hours Macroinvertebrate Identification, Humboldt Field Research Institute

40 hours Identification of Grasses, Sedges and Rushes, Humboldt Field Research Institute

SELECTED PROJECT EXPERIENCE (* denotes project experience prior to SWCA)

Cedar Creek Anticline Pipeline and Enhanced Oil Recovery Development Project; Multiple Counties, Wyoming; Denbury Onshore, LLC. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the Cedar Creek Anticline as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit). Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single National Environmental Policy Act document. *Role: Biologist. Responsible for identifying and mapping wetlands, stream and invasive plant populations within the EOR and pipeline project areas.*

Fink Rd and Smith Valley Recoats Water Crossing Survey & Permitting; Huntingdon County, Pennsylvania; Texas Eastern Transmission, LP. The project involved the excavation of an existing NGO pipeline to inspect and repair, if necessary. *Role: Wetland Specialist. Lead wetland delineator.*

Kinder Morgan Utopia Pipeline Projects; Fulton and Harrison Counties, Ohio; Kinder Morgan, Inc. The project involves the construction of an underground pipeline to convey natural gas product. *Role: Wetland Specialist. Provided natural resource identification and assessment for a 245-mile pipeline.*

***REX East Loop Pipeline; Eastern and Central Ohio; Tallgrass Energy.** Construction of an underground pipeline to convey natural gas product. *Role: Lead delineator; Field coordinator. Provided resource identification for a proposed natural gas pipeline project.*

***Seneca Seismic; Elk County, Pennsylvania; Seneca Resources.** Establishment of "shot holes" for a regional seismic study within state game lands. *Role: Lead wetland delineator. Provided resource identification for seismic survey crews.*

***Uintah Basin Oil Field; Uintah County, Utah; Crescent Point.** Development of oil fields on Ute Native American tribal land. *Role: Lead wetland delineator. Provide resource identification for oil field development.*

***Majorsville Pipeline; Washington County, Pennsylvania; MarkWest.** Construction of a 36-mile underground pipeline to convey natural gas product. *Role: Lead wetland delineator. Provided resource identification for a proposed natural gas pipeline project.*

EVAN DULIN, ENVIRONMENTAL SCIENTIST / FIELD LEAD

Mr. Dulin is an environmental scientist with experience in natural resources consulting with an emphasis on environmental regulations and compliance for federal, state, and local laws. Mr. Dulin has developed an understanding of National Environmental Policy Act (NEPA), Clean Water Act, and Endangered Species Act (ESA) compliance.

Mr. Dulin has five years of experience conducting wetland delineations and protected species habitat surveys throughout the country. His technical writing skills include the preparation of nationwide permits (NWP), pre-construction notifications (PCN), wetland delineations reports, environmental impact statements, and various other environmental compliance documents. Additionally, his experience includes analyzing data using ArcGIS software and programming in Excel.

YEARS OF EXPERIENCE

5

EXPERTISE

Threatened and endangered species surveys

Habitat assessments

Wetland assessments / delineations

Vegetation community assessments

Technical writing

NEPA

Excel programming

ArcGIS mapping

EDUCATION

B.S., Renewable Natural Resources;
Texas A&M University; College Station,
Texas; 2012

TRAINING

Certified Wetland Delineator, Wetland
Training Institute, Inc.

HeartSaver First Aid/CPR/AED,
American Heart Association

SELECTED PROJECT EXPERIENCE

Cedar Creek Anticline Pipeline and Enhanced Oil Recovery Development Project; Multiple Counties, Wyoming; Denbury Onshore, LLC. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline (CCA) Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the CCA as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit). Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single NEPA document. *Role: Environmental Specialist. Conducted wetland and waters of the U.S. surveys and surveys for ESA-listed species along the 114-mile pipeline and oil field sites. Conducted sage-grouse habitat surveys. Reviewed and conducted quality assurance / quality control on field collected data. Mapped natural resource features on a geographic information system.*

70-12 Pipeline Environmental Assessment and Cultural Resources; Multiple Counties, New Mexico; Western Refining. SWCA was contracted to write an Environmental Assessment for a proposed pipeline and associated pumping stations in southeast New Mexico crossing lands administered by the Bureau of Land Management (BLM) Carlsbad Field Office. SWCA performed biological and cultural resources surveys, in addition to species-specific surveys for lesser prairie-chicken (LPC). *Role: Environmental Specialist. Conducted LPC listening and habitat surveys.*

American Burying Beetle Biologist Retainer; Seminole County, Oklahoma; Kinder Morgan, Inc. Ongoing projects involve determination of potential impacts to the *Nicrophorus americanus* and assistance in developing mitigation measures in partnership with the U.S. Fish and Wildlife Service (USFWS) where projects intersect the species' range, and conducting 111 American Burying Beetle presence/absence surveys when applicable. *Role: Environmental Specialist. Mr. Placed and monitored American Burying Beetle traps during field investigations. In addition, he converted existing USFWS survey forms to custom Excel format datasheets to improve reporting speed and accuracy for this and future American Burying Beetle projects.*

BLM Nestucca River Road Biological Assessment; Tillamook County, Oregon; LEI Engineering & Surveying, LLC. In assistance to the BLM, SWCA is preparing a biological assessment and essential fish habitat assessment in compliance with the ESA and BLM

standards and guidelines along a 41-mile-long section of the Nestucca River National Back Country Byway planned for upgrades. The Biological Assessment will address project level effects to Oregon Coast coho salmon and their designated critical habitat in the Nestucca River and associated watersheds. *Role: Environmental Specialist. Assisted in analyzing fish distribution and occurrences in the project area.*

Gaucha-Thistle Pipeline Environmental Services; Eddy County, New Mexico; Enterprise Products Operating, LLC. SWCA is providing environmental compliance services for a new, approximately 20-mile crude oil pipe line in southeastern New Mexico. The project traverses through lands administered by the BLM Carlsbad Field Office, in addition to New Mexico state trust lands and private. Services include biological and cultural resources surveys, LPC protocol surveys, and preparation of an environmental assessment for BLM. LPC surveys followed the BLM survey protocol. *Role: Environmental Specialist. Conducted LPC listening surveys and biological assessments.*

Knox Ranch Waters of the U.S. Delineation; Hood County, Texas; Doucet and Associates, Inc. SWCA conducted a delineation of waters of the U.S. for an approximate 234-acre property. *Role: Environmental Specialist. Performed Section 404 jurisdictional determinations and protected species investigations, and prepared technical reports for regulatory agencies.*

Legend Project Surveys and Permitting; Granbury, Hood County, Texas; Confidential. This project consisted of construction of a pipeline requiring a delineation of the waters of the U.S. SWCA provided this delineation, as well as performed U.S. Army Corps of Engineers (USACE) and State Historical Preservation Office consultations and intensive natural and cultural resource investigations within the project area. *Role: Environmental Specialist. Performed Section 404 jurisdictional determinations and protected species investigations, and prepared technical reports for regulatory agencies.*

Logansport Pipeline Survey and Permitting; Multiple Counties, Multiple States; DCP Midstream, LP. This project consisted of construction of a pipeline requiring a delineation of the waters of the U.S. SWCA provided this delineation, as well as performed USACE and State Historical Preservation Office consultations and intensive natural and cultural resource investigations within the project area. *Role: Environmental Specialist. Performed Section 404 jurisdictional determinations and protected species investigations, and prepared technical reports for regulatory agencies.*

LES II Gathering System Environmental Services; Grady County, Oklahoma; Legion Energy Services, LLC. SWCA prepared a Permit Application for a Natural Gas Compressor Station and submitted the application to the Oklahoma Department of Environmental Quality Air Quality Division. *Role: Environmental Specialist. Performed Section 404 jurisdictional determinations and protected species investigations, conducted Phase I Environmental Site Assessment on proposed pump station sites, and prepared technical reports for regulatory agencies.*

Seaway Pipeline (Loop) Segment 1; Multiple Counties, Multiple States; Enterprise Products Operating, LLC. SWCA conducted an intensive natural and cultural resources survey of the Seaway Loop Pipeline project in multiple Texas and Oklahoma counties. *Role: Environmental Specialist. Assisted in performing Section 404 jurisdictional determinations and protected species investigations, and prepared progress reports and technical reports for regulatory agencies.*

Southern Kansas Lesser Prairie Chicken Lek Surveys; Multiple Counties, Multiple States; Natural Gas Pipeline Company of America. SWCA is providing environmental services in support of new oil and gas development areas within the known range for the LPC. Services include LPC lek presence/absence surveys and general biological surveys for threatened and endangered species, jurisdictional waterways, wetlands, and migratory nesting birds. One new lek was detected during the survey effort. *Role: Environmental Specialist. Conducted LPC listening surveys in Kansas and Colorado.*

Texas Express Pipeline (Segments 1 & 2); Montgomery County, Texas; Texas Express Pipeline, LLC. SWCA conducted natural and cultural resource surveys in support of Section 404 Clean Water Act and Section 10 River and Harbors Appropriation Act authorizations associated with three USACE Districts via NWP 12. Additionally, SWCA obtained numerous state permit authorizations and provided up to 15 Environmental Inspectors over the course of construction to assist in maintaining environmental compliance. *Role: Environmental Specialist. Assisted in performing Section 404 jurisdictional determinations and protected species investigations, and prepared technical reports for regulatory agencies.*

RUSSELL DUNCAN, B.A., FIELD BIOLOGIST

Mr. Duncan is a broad-based field biologist who specializes in governmental and private environmental compliance documentation associated with threatened and endangered species. Mr. Duncan has prepared various regulatory documents associated with the Endangered Species Act (ESA), such as Biological Assessments and Evaluations, Environmental Assessments, and relevant chapters in Environmental Impact Statements. He has also provided general conservation solutions for impacts to the overall environment in the public and private sectors.

Mr. Duncan's field experience in the western U.S. extends to a variety of biotic communities where he has continually familiarized himself with the native flora and fauna within these systems, e.g., montane conifer forests and woodlands, warm and cold deserts, plains and desert grasslands, chaparral and sage scrub, and various wetland types.

As a field biologist with SWCA, Mr. Duncan is responsible for conducting vegetation and wildlife monitoring and field surveys and relevant survey reports for threatened and endangered species. His experience includes surveys that adhere to specific protocols for various rare cacti and other plants, reptiles and amphibians, and various birds like northern goshawks, spotted owls, ferruginous pygmy-owls, southwestern willow flycatcher, least Bell's vireo and California gnatcatchers.

YEARS OF EXPERIENCE

31

EXPERTISE

Raptor and bat surveys

Rare plant and botanical surveys

Threatened & Endangered Species
Surveys and Compliance
Documentation

Vegetation and Wildlife Surveys /
Habitat Assessments / Wetland
Identification

EDUCATION

B.A., Ecology, e: Herpetology, m:
Classical History/Outdoor Rec.; Prescott
College, Arizona; 1981

TRAINING

Wetland Identification and Delineation,
U.S. Army Corps of Engineers protocols
(Certificate Awarded), Humboldt Field
Research Institute; 2006

MEMBERSHIPS

Member, Society for Conservative
Biology

Member, Society for Study of
Amphibians and Reptiles

SELECTED PROJECT EXPERIENCE

Cedar Creek Anticline Pipeline and Enhanced Oil Recovery Development Project; Wyoming and Montana; Denbury Onshore, LLC. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline (CCA) Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the CCA as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit.) Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single National Environmental Policy Act document. *Role: Biologist. Conducted wetland and water body surveys, Greater sage-grouse transects and EcoClass surveys, Sage-grouse habitat assessments and model survey work.*

Bull Mountain Pipeline Vegetation Monitoring; Gunnison County, Colorado; Gunnison Energy Corporation. SWCA performed vegetation sampling along a pipeline right-of-way and annual monitoring of deer, elk, and moose browse for three consecutive years as requested by the Colorado Division of Wildlife. *Role: Environmental Specialist. Conducted vegetation monitoring.*

Grand Valley 3D Cultural and Natural Resources Survey; Parachute, Garfield County, Colorado; Green River Energy Resources, Inc. SWCA provided cultural and natural resources surveys and reports. *Role: Biologist. Conducted over 600 hours of rare plant surveys, prepared survey report and flagged habitat for rare plant avoidance.*

Piceance Creek 3D Seismic; Rio Blanco County, Colorado; St. Croix Seismic, LLC. SWCA performed both site-specific and block surveys for cultural, biological (wildlife/raptors/rare plants), and paleontological resources as a third-party contractor to the Bureau of Land Management White River Field Office on a large-scale oil and gas well development. SWCA tasks included National Environmental Policy Act support compliance and assisting in the preparation of Environmental Assessment and Biological Assessment documents and supporting survey reports for both Bureau of Land Management and U.S. Fish and Wildlife Service review. *Role: Biologist. Conducted biological surveys.*

DOUG FAULKNER, M.S., BIOLOGIST

Mr. Faulkner has over 20 years of biology and ornithology experience in the southern and western United States, Costa Rica, and Mexico, and is recognized as a regional expert in field ornithology. He also is the lead biologist for bat monitoring projects in SWCA's Rocky Mountains and Plains region. He conducts field surveys, performs desktop review of scientific literature, and consults with agency resource specialists to address impacts on biological resources considered in National Environmental Policy Act (NEPA) documents. With general and specific knowledge of natural history across multiple tax and competence in local, state, and federal regulations pertaining to wildlife conservation and management, Mr. Faulkner advises on environmental study design and analysis, and peer reviews technical reports. He is published in peer-reviewed journals and is currently an associate editor of the peer-reviewed regional journal *Western Birds*.

YEARS OF EXPERIENCE

22

EXPERTISE

North American bird identification and biogeography

Avian survey protocol/methodology

Anabat active and passive survey techniques

Bat identification of zero-crossing data

Scientific literature peer review

Impact analysis and wildlife-energy development issues

EDUCATION

M.S., Wildlife Biology, e: Avian Behavioral Ecology; Ball State University, Indiana; 1996

B.S., Wildlife Biology, m: Botany; Ball State University, Indiana; 1993

TRAINING

AnalogW Advanced Analysis Workshop; 2012

Wildlife Acoustics Training (SM2Bat); 2012

BCI Acoustic Monitoring Workshop, Bat Conservation International; 2010

Anabat Bat Techniques Workshop, Bats R Us and Bat Sense; 2011

Advanced NEPA topics, SWCA Environmental Consultants; 2009

SELECTED PROJECT EXPERIENCE

Cedar Creek Anticline Pipeline and Enhanced Oil Recovery Development Project; Multiple Counties, Wyoming; Denbury Onshore, LLC. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline (CCA) Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the CCA as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit). Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single NEPA document. *Role: Biologist: Conducted aerial wildlife surveys for raptor nests, prairie dog colonies, potential wading bird rookery and eagle winter roost sites, and potential mountain plover habitat, and desktop quality assurance / quality control (QA/QC) of ground-based wildlife habitat global positioning system (GPS) delineations. Authored wildlife resource reports and provided senior level review of other project natural resource reports.*

Bell Creek EOR Development Project; Powder River County, Wyoming; Denbury Resources, Inc. SWCA continues to consult with the Bureau of Land Management (BLM) Miles City Field Office regarding avoidance and mitigation strategies for known biological, cultural, and paleontological features that SWCA crews identified in an EOR project area at the existing Bell Creek oil field. The EOR development will occur in nine phases, and construction is planned to be completed in all nine phases by 2020. Project-related tasks for SWCA include field surveys, monitoring during construction, reporting, and routing support for all nine phases of the project. SWCA continues to provide Environmental Inspection services, including stormwater permitting and inspections as required by the Montana Department of Environmental Quality, during construction. SWCA is also monitoring the entire project area for noxious weeds, and coordination will be conducted for weed spraying as required. *Role: Biologist: Co-authored wildlife resource reports and assisted with northern myotis habitat assessment.*

Coyote Creek and Fulton Ditch Meter Station Cultural and Natural Resource Reviews; Weld County, Colorado; Kinder Morgan, Inc. SWCA conducted natural and cultural resource surveys for the proposed installation of two meter stations and related appurtenances. *Role: Biologist. Conducted desktop review of threatened and endangered species, sensitive species, and other environmental concerns, and authored resource report.*

Eight Integrity Digs Environmental Review; Multiple Counties, Colorado; Enterprise

Introduction to Endangered Species Act, SWCA Environmental Consultants; 2009

Introduction to NEPA, SWCA Environmental Consultants; 2009

Wyoming Pocket Gopher survey protocols and techniques, Wyoming Natural Diversity Database; 2009

AWARDS / HONORS

Environmental Stewardship Award

Promising Ornithologist Award

MEMBERSHIPS

Secretary, Colorado Bird Records Committee; 2006

Member, Colorado Field Ornithologists; 1999

Member, Partners in Flight; 2000

Member, Western Field Ornithologists; 2002

Products Operating, LLC. SWCA conducted natural and cultural resource desktop reviews for eight integrity digs. *Role: Biologist. Conducted desktop review of threatened and endangered species, sensitive species, and other environmental concerns, and authored resource sections of final report.*

Heritage Todd Creek CWA Permit Compliance; Thornton, Adams County, Colorado; Confidential. SWCA assisted the client in obtaining an Individual Permit under Section 404 of the Clean Water Act. SWCA designed the mitigation and restoration required for site stabilization and performed annual monitoring for five years until 2012 when the permit was declared complete by the U.S. Army Corps of Engineers. *Role: Environmental Specialist. Conducted prairie dog survey and authored survey report.*

Hess Stony Creek 3D; Williams County, North Dakota; Hess Corporation. SWCA coordinated with federal and state agencies and evaluated environmental consequences of land- and water-based seismic surveys in and around Lake Sakakawea. SWCA also assisted with a study to determine the potential impacts of seismic air guns on the endangered pallid sturgeon. *Role: Biologist. Responsible for authoring terrestrial threatened and endangered species section of Biological Assessment.*

Wray Environmental Assessment Surveys; Yuma County, Colorado; Confidential. SWCA conducted natural and cultural resource surveys for the proposed 90-megawatt Wray Wind Energy Project in northeastern Colorado to support an Environmental Assessment required for NEPA compliance. Work included wildlife monitoring surveys for greater prairie chicken, migratory and resident raptors, songbirds, black-tailed prairie dog, mountain plover, and other species of concern, as well as seasonal Anabat surveys. *Role: Environmental Specialist. Conducted migratory bird point counts, greater prairie-chicken lek surveys, raptor*

nest surveys, and bat acoustic (Anabat) surveys, data analysis, and report writing.

Lines 5A & 5B Meter Station Weld County Cultural and Natural Resources Survey; Weld County, Colorado; Kinder Morgan, Inc. SWCA conducted natural and cultural resource surveys for the proposed installation of a meter station and related appurtenances along two natural gas lines. *Role: Environmental Specialist. Conducted desktop review of threatened and endangered species, sensitive species, and other environmental concerns, and authored resource report.*

Limon Wind Farm Permitting; Multiple Counties, Colorado; NextEra Energy Resources, LLC. SWCA conducted raptor nest and avian point count surveys as well as burrowing owls, prairie dogs, and bats surveys. *Role: Biologist. Developed protocols and conducted avian surveys for migratory birds and diurnal raptors and authored final report.*

Ryan Gulch Block Surveys; Rio Blanco County, Colorado; WPX Energy, Inc. SWCA performed both site-specific and block surveys for cultural, biological (wildlife/raptors/rare plants), and paleontological resources as a third-party contractor to the BLM White River Field Office on a large-scale oil and gas well development. SWCA tasks included NEPA support compliance and assisting in the preparation of Environmental Assessment and Biological Assessment documents and supporting survey reports for both BLM and U.S. Fish and Wildlife Service review. *Role: Biologist. Authored biological survey report.*

Seminole Pipeline Stormwater Planning and Inspections; Multiple Counties, Multiple States; Phillips 66 Company. SWCA provided wetland delineation, biological and archeological surveys, and Wyoming Department of Environmental Quality permitting for a pipeline reroute around the City of Casper. *Role: Environmental Specialist. Performed threatened and endangered species habitat assessment and noxious weed survey and authored survey report.*

Golden Grizzly Cultural and Natural Surveys; Converse County, Wyoming; SM Energy Company. SWCA is providing natural and cultural resource services, including Class I and Class investigations, and permitting support for approximately 75 proposed federal wells, flow lines, and associated infrastructure for oil exploration and extraction from the Niobrara Formation in eastern Wyoming. SWCA is conducting field surveys, monitoring protected resources as required, and writing technical reports in support of federal permitting. *Role: Biologist. Conducted senior level review and QA/QC of biological resource reports.*

MAC FULLER, B.A., ENVIRONMENTAL SPECIALIST

Mr. Fuller is an environmental scientist experienced in environmental planning and permitting for energy clients in the Midwest, Northeast and Mountain West regions of the United States. His responsibilities have included organizing and leading natural resource field surveys, a variety of geographic information systems (GIS) roles, report writing and agency coordination.

Mr. Fuller's permitting experience includes state and federal Endangered Species Acts (ESA), environmental impact statements, Federal Energy Regulatory Commission (FERC) 7(c) applications, National Environmental Policy Act (NEPA) experience, Migratory Bird Treaty Act experience and he has authored several environmental assessments (EAs).

YEARS OF EXPERIENCE

7

EXPERTISE

Energy development planning and permitting

Natural resource field surveys

GIS

Environmental inspection / construction monitoring

FERC Section 7 compliance

Migratory Bird Treaty Act compliance

Wetland delineations

Environmental sampling and analysis

EDUCATION

B.A., Environmental Geoscience;
DePauw University; Greencastle,
Indiana; 2008

TRAINING

Environmental Review and Compliance
Training, FERC; 2013

Wetland Delineation Training, U.S. Army
Corps of Engineers

Environmental Compliance during
Pipeline Construction, Southern Gas
Association; 2014

HAZWOPER 40-hour Training, OSHA

First Aid, CPR and AED training,
American Red Cross

SELECTED PROJECT EXPERIENCE (* denotes project experience prior to SWCA)

Cedar Creek Anticline Pipeline and Enhanced Oil Recovery Development Project; Multiple Counties, Wyoming; Denbury Onshore, LLC. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the Cedar Creek Anticline as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit). Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single NEPA document. *Role: Environmental Specialist. Managed field surveys of pipeline and EOR field for sage-grouse habitat analysis. Completed sage-grouse habitat modeling for use in sage-grouse mitigation plan for entire project.*

Cowboy Pipeline; Multiple Counties, Multiple States; Confidential. SWCA conducted pre-construction environmental studies, permitting, and environmental inspection services, including biological and cultural resource surveys for a proposed 27-mile crude oil pipeline to obtain agency concurrence for Clean Water Act and ESA compliance. SWCA coordinated with project engineers and the Environmental Coordinator to developing a permitting strategy that provided full compliance with Clean Water Act provisions, but that avoided submission of a pre-construction notification. SWCA also worked with the state agencies to obtain coverage under stormwater and hydrostatic discharge permits. Due to familiarity with the permitting requirements, SWCA was able to effectively perform environmental inspections on a daily basis and stormwater inspections as required for our client. *Role: Environmental Specialist. Managed environmental inspectors as part of pipeline installation project including the coordination and review of all daily and weekly reports.*

Golden Grizzly Cultural and Natural Surveys; Converse County, Wyoming; SM Energy Company. SWCA is providing natural and cultural resource services, including Class I and Class investigations, and permitting support for approximately 75 proposed federal wells, flow lines, and associated infrastructure for oil exploration and extraction from the Niobrara Formation in eastern Wyoming. SWCA is conducting field surveys, monitoring protected resources as required, and writing technical reports in support of federal permitting. *Role: Environmental Specialist. Completed natural resource field surveys including greater sage-grouse and sharp-tail grouse habitat assessments.*

Vermilion Energy East Finn Project; Confidential County, Wyoming; Vermilion Energy

USA, LLC. SWCA conducted a pre-field analysis of existing data (e.g. geologic map review, previous locality search, literature review), field surveys, fossil collection; communicated and consulted with federal agencies (e.g. U.S. Forest Service and Bureau of Land Management); and completed survey reports, which summarized the pre-field and field results and included recommendations for the construction phase of the project. *Role: Environmental Specialist. Completed natural resource field surveys including greater sage-grouse and sharp-tail grouse habitat assessments.*

Riley Ridge to Natrona Pipeline; Multiple Counties, Wyoming; Denbury Resources, Inc. SWCA began providing cultural and natural resource services for a 243-mile CO₂ pipeline in central Wyoming in 2012 and will continue to provide these services through all phases of the project up to its completion. Tasks include field surveys, preparation of environmental and cultural resources documentation in support of Bureau of Land Management right-of-way grant application and Clean Water Act Section 404 permitting and ESA compliance. *Role: Project Coordinator. Set up and coordinated field survey efforts. Completed biological field surveys including those for wetlands, waterbodies, sage-grouse, pygmy rabbits, raptors (aerial), prairie dogs, and noxious weeds. As a GIS Technician he coordinated and managed all GIS files for project. Performed quality assurance and control of field data, distributed project files, created maps, and completed analysis. Performed quality control of field data, distributed project files, created maps, and completed analysis. Coordinated Management of Change process for entire project.*

***Williams Springville Pipeline Planning and Permitting; Pennsylvania.** Environmental surveys, planning and permitting as part of Pennsylvania Department of Environmental Protection Joint Permit Application for construction of proposed pipeline. *Role: Field team lead, GIS analyst. Coordinated and led field surveys, including data collection and processing.*

***Columbia Line 1570 Gas Pipeline Replacement Project; Pennsylvania.** Environmental surveys, planning and permitting required for FERC, 7(c) application filing for natural gas pipelines. *Role: Field coordinator, Permitting manager, GIS manager. Managed field surveys, including those for Indiana Bat, permitting efforts with federal, state and local agencies and authored resource reports as part of FERC 7(c) application.*

72A Line Conversion and Douglas Lateral Natural and Cultural Resource Surveys; County, Wyoming; Kinder Morgan, Inc. SWCA is conducting pre-construction environmental studies, including biological and cultural resource surveys, reporting and permitting services, for a proposed 113-mile natural gas liquids pipeline in Wyoming. SWCA coordinates with client project engineers and environmental specialists in identifying opportunities for impacts minimization and avoidance. SWCA is serving as the primary contact for the Bureau of Land Management's processing of a grant application, including preparation of an EA. *Role: Environmental Specialist. Completed natural resource field surveys.*

Greencore CO₂ Pipeline Project; Multiple Counties, Wyoming; Denbury Resources, Inc. SWCA consulted with the Bureau of Land Management Casper Field Office regarding avoidance and mitigation strategies for known biological, cultural, and paleontological features that SWCA crews identified in the project area for a 231-mile-long CO₂ pipeline between the ConocoPhillips Lost Cabin Gas Plant in Fremont County, Wyoming, and a point in the Bell Creek oil field in Powder River County, Montana. The CO₂ transported by the pipeline will be used for EOR at the existing Bell Creek oil field. SWCA is responsible for monitoring the entire project area for noxious weeds, and coordination will be conducted for weed spraying as needed. SWCA is also conducting the fieldwork, reporting, and agency consultation for the annual post-construction right-of-way monitoring until success criteria have been met. *Role: Environmental Specialist. Completed monthly, post-construction stormwater pollution prevention plan inspections and right-of-way monitoring.*

WPX Energy Williston, LLC; McKenzie County, North Dakota; WPX Energy Williston, LLC. SWCA has been contracted on an "on-call" basis to conduct natural and cultural resource surveys, prepare EAs, EA addendums, cultural resource reports, and any other documentation or surveys as required by NEPA, the Bureau of Indian Affairs, or other pertinent agencies, as well as provide informal consultations with the U.S. Fish and Wildlife Service. *Role: Environmental Specialist. Completed natural resource field surveys including greater sage-grouse and sharp-tail grouse habitat assessments.*

***NiSource Schafer Station Expansion Permitting; Indiana.** Environmental surveys and permitting for proposed coal power plant expansion. *Role: Wetland delineator. Completed wetland delineations of an 120-acre proposed expansion site and authored wetland delineation report used for permitting.*

STEPHEN FULLER, B.A., BOTANICAL FIELD TECHNICIAN

Mr. Fuller is an environmental specialist for SWCA's Salt Lake City office, where he leads small teams while in the field; collects and manages data concerning client projects; coordinates travel between field sites; and organizes field and safety equipment.

Mr. Fuller has ecological experience throughout the Intermountain West and has led natural resource teams on projects pertaining to threatened and endangered species permitting, as well as wetland delineation and habitat assessment in Utah, Wyoming, and Montana. He has additional experience in restoration ecology, and a background in first aid and CPR.

YEARS OF EXPERIENCE

2

EXPERTISE

Plant Ecology

Flora of the Intermountain West

EDUCATION

B.A., Environmental Studies e: Biology and Anthropology; Washington University, St. Louis, Missouri; 2013

REGISTRATIONS / CERTIFICATIONS

CPR certification

NOLS Wilderness First Aid certification

TRAINING

Safeland PEC training

AWARDS / HONORS

Outstanding Achievement in Environmental Studies; 2013

MEMBERSHIPS

Utah Native Plant Society

SELECTED PROJECT EXPERIENCE

Cedar Creek Anticline Pipeline and Enhanced Oil Recovery Development Project; Multiple Counties, Wyoming; Denbury Onshore, LLC. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the Cedar Creek Anticline as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit). Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single National Environmental Policy Act document. *Role: Environmental Specialist. Led field crew on wetland delineations and sage-grouse habitat assessment.*

Anadarko Uinta Basin Midstream; Uintah County, Utah; Anadarko Petroleum Corporation. SWCA has conducted threatened and endangered species clearances, wildlife, paleontological, and cultural surveys to assist Anadarko in the placement of over 300 proposed new and expansion locations of existing oil/natural gas well pads and associated infrastructure throughout Utah. Coordination with the Bureau of Land Management (BLM), U.S. Fish and Wildlife Service and tribal governments occurred on several sites. *Role: Environmental Specialist. Led field crew on surveys for Uintah basin hookless cactus.*

Environmental Services TES Surveys; Uintah County, Utah; Confidential. SWCA conducted cultural, paleontological, plant, and wildlife resource surveys as well as compliance monitoring for proposed well locations, access roads, and pipelines. SWCA also produced a final report disclosing the results of the survey. *Role: Environmental Specialist. Led field crew on surveys for Uintah basin hookless cactus and coordinated writing of the report.*

Kearns Campus Wetland Assessment; Park City, Summit County, Utah; VCBO Architecture. SWCA performed a wetland assessment. *Role: Environmental Specialist. Performed wetland delineation and prepared portions of the report.*

Meritage NGL Pipeline Environmental Support; Gillette, Campbell County, Wyoming; Meritage Operating Company, LLC. SWCA is providing natural and cultural resource services for an approximately 300-mile-long oil and gas pipeline gathering system in eastern Wyoming. Desktop analyses and field surveys are performed in support of federal and state regulatory compliance and permitting needs, including U.S. Army Corps of Engineers nationwide permitting and U.S. Fish and Wildlife Service compliance. *Role: Environmental Specialist. Performed several days of surveys for regulatory compliance and placement of*

best management practices.

ML-103 Special Status Plant Monitoring; Uintah County, Utah; Questar Pipeline Company. SWCA conducted monitoring of special status plant species in the Weaver Canyon portion of a pipeline replacement corridor. *Role: Environmental Specialist. Performed several days of Graham's and White River beardtongue monitoring.*

SITLA Penstemon Team Support; Uintah County, Utah; Utah School and Institutional Trust Lands Administration. SWCA performed services to support the development and implementation of management under the Penstemon Conservation Agreement and Strategy. *Role: Environmental Specialist. Conducted range-wide surveys and habitat assessments of threatened penstemon species.*

Endangered Species Mitigation Fund Penstemon Restoration Action; Uintah County, Utah; Utah Department of Natural Resources. SWCA conducted range-wide distributional surveys, ecological studies, and restoration research to support inter-agency conservation initiatives for Graham's and White River beardtongue in the Uinta Basin. *Role: Environmental Specialist. Led field crews on range extension surveys, seed collection, habitat assessment, and transplantation of threatened penstemon species.*

Ute Ladies'-tresses 2014 Survey; Roosevelt, Duchesne County, Utah; Kinder Morgan, Inc. SWCA conducted a pre-field environmental desktop assessment and pre-construction field-based migratory bird/raptor nesting surveys along the proposed Lake Fork Ranch 4-2B4 well connect in Duchesne County, Utah. *Role: Environmental Specialist. Conducted several days of habitat assessment and presence/absence surveys for threatened Ute Ladies'-tresses and nesting bird surveys.*

Sclerocactus Range-wide Demographic Monitoring; Uintah County, Utah; National Fish and Wildlife Foundation. In 2012, SWCA designed and implemented range-wide demographic and habitat monitoring for federally-listed (Fed-T) *Sclerocactus* species in the Uintah Basin, Utah. The aim of the project is to provide statistically-supported evidence of population processes, demographic trends, habitat preferences, and current and changing habitat conditions for Paria cactus (*Sclerocactus brevispinus*) and Uinta Basin hookless cactus (*Sclerocactus wetlandicus*). *Role: Environmental Specialist. Collected data on several populations of both cactus species and assisted in the tagging and data collection of multiple new subpopulations.*

Vernal Field Vegetation Monitoring; Multiple Counties, Multiple States; EOG Resources, Inc. SWCA developed a novel reclamation approach for the Uinta Basin Operations, incorporating ecological site concepts and data gathering technologies. *Role: Environmental Specialist. Led team over several days of data collection throughout the Uintah Basin.*

Rock Springs Field Office RMP Weed Inventory; Sweetwater County, Wyoming; Rocky Mountain Power. SWCA conducted a weed inventory and survey on an existing 11.23-mile power line right-of-way located within the BLM Rock Springs Field Office and provided a summary report. *Role: Environmental Specialist. Conducted several days of noxious weed surveys along transmission line corridor.*

Environmental Services; Duchesne County, Utah; XTO Energy. SWCA conducted biological, archaeological, and paleontological surveys for proposed wells, roads and pipelines on Federal, State and Tribal land. *Role: Environmental Specialist. Conducted habitat assessment and presence/absence surveys for several threatened and endangered species near several proposed roads and well pads.*

BRETT HARTMANN, B.A., ENVIRONMENTAL SPECIALIST

Mr. Hartmann is an environmental specialist with SWCA's Denver, Colorado office. He performs a variety of field work tasks such as wetland delineations, stormwater pollution prevention plans (SWPPPs), wildlife and vegetation surveys, and habitat assessments. Mr. Hartmann has over 2 years of permitting, regulatory, and environmental fieldwork experience with the natural resource industry in the Rocky Mountain region, Great Plains region, and Florida.

YEARS OF EXPERIENCE

2

EXPERTISE

Project management

Environmental management

Mitigation and remediation

EDUCATION

B.A., Environmental Studies; Montana State University, Bozeman, Montana; 2013

REGISTRATIONS / CERTIFICATIONS

NSC CPR and First Aid Certified

PEC Safety Basic Orientation

TRAINING

OSHA New Miner Trained

Florida Pesticide Applicator License – Natural Area and Right-of-Way

SELECTED PROJECT EXPERIENCE (* denotes project experience prior to SWCA)

Cedar Creek Anticline Pipeline and Enhanced Oil Recovery Development Project; Multiple Counties, Wyoming; Denbury Onshore, LLC. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the Cedar Creek Anticline as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit). Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single National Environmental Policy Act document. *Role: Field Biologist. Performed several months of field work; responsible for conducting wetland delineations, vegetation surveys, and habitat surveys.*

Rangeview Pipeline Gathering System Cultural and Natural Resource Evaluations; Weld County, Colorado; Saddle Butte Pipeline, LLC. SWCA conducted pre-construction environmental studies, natural and cultural resource field surveys, reporting, and permitting for a proposed 27-mile crude oil pipeline. We worked closely with the client to identify opportunities to minimize and avoid impacts to waters of the U.S. and also coordinated with the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service staff for permit authorizations and compliance. *Role: Field Biologist. Responsible for conducting wetland delineations.*

Stormwater Inspection Services; Richland County, Montana; Confidential. SWCA conducted stormwater inspections and provided permitting services throughout Montana and North Dakota. *Role: Biologist. Conducted SWPPP field inspections.*

Well Pad Natural Resources Services; Weld County, Colorado; Confidential. SWCA is providing on-going natural resources services for several well pad locations in the Colorado Front Range. Services include wetland delineations, installation, monitoring, and removal of groundwater monitoring wells, and additional field surveys as needed. *Role: Field Biologist. Conducted redzone and ESIF; identified wetlands and conducted delineations. Installed and removed groundwater monitoring well and recorded water depths.*

*** Multiple Projects; Miami, Florida; Cemex Aggregate Division.** *Role: Environmental Specialist. While employed with Cemex, Mr. Hartmann worked on numerous projects in the Aggregate Division. Project experience included: updating and ensuring compliance of mining and environmental permits; planning, managing, and conducting remediation and mitigation of project areas; reviewing and approving environmental reports; collecting and analyzing water, air, and vegetation data; removing non-native flora and fauna; and negotiating and managing third-party environmental services.*

KIMBERLY IP, B.S., BIOLOGIST / ECOLOGIST

Ms. Ip is a biologist in SWCA's Sheridan, Wyoming office with more than 10 years of experience related to natural resources research, wildlife biology, population analysis, and database management. Her areas of expertise include animal ecology, National Environmental Policy Act (NEPA) analyses, ArcGIS, habitat assessments, and wildlife surveys, with a focus on small mammals.

Ms. Ip's experience includes conducting surveys for threatened and endangered species, raptors, wetland delineation, and noxious weeds; writing resource sections for NEPA documents; and performing wildlife population estimates and habitat modeling. She has extensive background experience in Wyoming, North Dakota, South Dakota, Montana, Utah, Colorado, California, Louisiana and Alabama. She has worked on various oil and gas developments, pipelines, wind farms, and habitat restoration projects.

YEARS OF EXPERIENCE

11

EXPERTISE

Wildlife Biology

Behavioral Ecology

NEPA Compliance and Analysis

Threatened and Endangered Species
Surveys and Monitoring

Small Mammal Ecology

Biological Assessments

Wetland Delineations

Wildlife and Plant Surveys

Habitat Assessments and Modeling

Scientific Database Management

Water Sampling

EDUCATION

B.S., Ecology, Behavior, and Evolution;
University of California, Los Angeles;
2004

TRAINING

Army Corps of Engineers Wetland
Delineation Training, Richard Chinn
Environmental Training, Inc.; 2012

Applying the NEPA Process and Writing
Effective NEPA Documents, The
Shipley Group; 2012

SELECTED PROJECT EXPERIENCE

Cedar Creek Anticline Pipeline and Enhanced Oil Recovery Development Project; Multiple Counties, Wyoming; Denbury Onshore, LLC. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the Cedar Creek Anticline as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit). Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single NEPA document. *Role: Environmental Specialist. Responsible for conducting natural resource desktop analyses, aerial wildlife surveys, field delineations of wetlands and other waters of the U.S., and field data analysis.*

A Cross Mitigation Bank Wetland Delineation; Encampment, Carbon County, Wyoming; EcoAsset Management, LLC. SWCA conducted a wetland delineation, an aquatic resource inventory, vegetation surveys, and reporting for a proposed mitigation bank application package. *Role: Wetland Scientist. Responsible for performing wetland delineations and writing aquatic resources inventory report.*

Anadarko Uinta Basin Midstream; Uintah County, Utah; Anadarko Petroleum Corporation. SWCA has conducted threatened and endangered species clearances, wildlife, paleontological, and cultural surveys to assist Anadarko in the placement of over 300 proposed new and expansion locations of existing oil/natural gas well pads and associated infrastructure throughout Utah. Coordination with the Bureau of Land Management (BLM), U.S. Fish and Wildlife Service and tribal governments occurred on several sites. *Role: Biologist. Conducted population surveys and habitat assessments for a threatened and endangered cactus species.*

Bell Creek EOR Development Project; Powder River County, Wyoming; Denbury Resources, Inc. SWCA continues to consult with the BLM Miles City Field Office regarding avoidance and mitigation strategies for known biological, cultural, and paleontological features that SWCA crews identified in an EOR project area at the existing Bell Creek oil field. The EOR development will occur in nine phases, and construction is planned to be completed in all nine phases by 2020. Project-related tasks for SWCA include field surveys, monitoring during construction, reporting, and routing support for all nine phases of the project.

SWCA also continues to provide Environmental Inspection services, including stormwater permitting and inspections as required by the Montana Department of Environmental Quality, during construction. SWCA will also monitor the entire project area for noxious weeds, and coordinate weed spraying as required. *Role: Wildlife Biologist. Responsible for conducting surveys for sharp-tailed grouse leks, raptor and eagle nests, mountain plovers, prairie dog colonies, burrowing owls, and other BLM sensitive species.*

Chokecherry and Sierra Madre SPOD 1 Biological Surveys; Carbon County, Wyoming; Power Company of Wyoming, LLC. SWCA is conducting right-of-way surveys for the SPOD 1's of the Chokecherry and Sierra Madre project. *Role: Biologist. Conducted population surveys and habitat assessments for two rare mammals, the pygmy rabbit and the Wyoming pocket gopher. Performed wetland delineations.*

Denbury Bell Creek EOR Resource Support; Belle Creek, Powder River County, Montana; AECOM, Inc. SWCA provided Class I and Class III investigations for an EOR and CO₂ Sequestration project covering approximately 20,000 acres parceled into 9 development phases spanning 2010–2015. *Role: Ecologist. Conducted population surveys and habitat assessments for threatened and endangered plant species and general wildlife surveys; performed data analysis. Conducted vegetation reclamation monitoring and verified success of rare plant transplants.*

North Platte Environmental Restoration Master Plan; Casper, Natrona County, Wyoming; Stantec, Inc. Stantec and SWCA teamed together to provide an Environmental Restoration Master Plan. This master plan provided an assessment of the existing morphology and riparian vegetation conditions of a proposed channel and riparian restoration strategies for the North Platte River in a 13.5-mile stretch that flows through the City of Casper, the Town of Mills, and Natrona County. Following completion of the Master Plan, six project areas were identified and taken to the final design stages. SWCA conducted aquatic resource inventories, cultural surveys, revegetation planning, and permitting services in support of the development of the final restoration design. *Role: Ecologist. Conducted tree surveys and wetland delineations for the North Platte River Restoration Plan. Prepared aquatic resources inventory reports for U.S. Army Corps of Engineers consultation.*

Riley Ridge to Natrona Project; Fremont County, Wyoming; AECOM, Inc. SWCA provided cultural and paleontological services for an approximately 244-mile-long CO₂ pipeline throughout Wyoming that ties into the Greencore Pipeline at the Natrona Hub. Surveys began in 2012 and continued through all phases of the project up to its final completion. *Role: Ecologist. Responsible for population surveys, habitat assessments, and model verification of threatened and endangered mammal and plant species. Conducted wetland, water body, and stream delineations. Performed general wildlife surveys.*

Seminole HDD; Lodge Grass, Big Horn County, Montana; ConocoPhillips. SWCA provided desktop analyses, field surveys, and resource reports on natural and cultural resources for six alignment reroutes of an oil pipeline project in southeastern Montana. *Role: Biologist. Conducted wildlife, vegetation, and raptor surveys; assisted with preparation of biological report.*

Golden Grizzly Cultural and Natural Surveys; Converse County, Wyoming; SM Energy Company. SWCA is providing natural and cultural resource services, including Class I and Class investigations, and permitting support for approximately 75 proposed federal wells, flow lines, and associated infrastructure for oil exploration and extraction from the Niobrara Formation in eastern Wyoming. SWCA is conducting field surveys, monitoring protected resources as required, and writing technical reports in support of federal permitting. *Role: Assistant Project Manager. Assisting with project management. Responsible for coordinating field personnel, conducting wildlife and plant surveys, performing wetland and stream delineations, and writing BLM wildlife reports.*

Vermilion Energy East Finn Project; Confidential County, Wyoming; Vermilion Energy USA, LLC. SWCA conducted a pre-field analysis of existing data (e.g. geologic map review, previous locality search, literature review), field surveys, fossil collection; communicated and consulted with federal agencies (e.g. U.S. Forest Service and BLM); and completed survey reports, which summarized the pre-field and field results and included recommendations for the construction phase of the project. *Role: Wildlife Biologist. Assisted with project management. Performed surveys for greater sage-grouse, raptors, mountain plover, prairie dogs, Ute ladies'-tresses, blowout penstemon, and noxious weeds. Conducted wetland delineations. Wrote biological resources reports.*

YMCA Camp Wetland Delineation; Sheridan County, Wyoming; States West Water Resources Corporation. States West hired SWCA to complete wetland delineations for planned rehabilitation and expansion of the YMCA Camp Roberts Fishing Pond in the Big Horn mountains. In support of this rehabilitation, SWCA conducted wetland delineations and prepared a wetland delineation report for *submittal to the U.S. Army Corps of Engineers*. *Role: Wetland Scientist. Performed full wetland delineations on waters of the U.S. for a pond rehabilitation project. Prepared technical report for consultation with U.S. Army Corps of Engineers.*

MEGHAN MCCORMICK, M.S., BIOLOGICAL TECHNICIAN

As a biological technician, Ms. McCormick has conducted field surveys in Utah, Wyoming, and Montana, aided in quality assurance and quality control of data, and led safety discussions. Her focus in the field is on botanical and rare plant surveys; however, she also has experience with wetland delineations and raptor nest surveys.

YEARS OF EXPERIENCE

4

EXPERTISE

Botany

Rare plant surveys

Greater sage-grouse habitat assessments

Wetland delineations

EDUCATION

M.S. magna cum laude, Plant Pathology; North Carolina State University, Raleigh, North Carolina; 2012

B.S. cum laude, Botany m: Chemistry; Weber State University, Ogden, Utah; 2009

A.S., Biology; Biology, Salt Lake Community College, Salt Lake City, Utah; 2006

MEMBERSHIPS

Member, Mycological Society of America; 2010

Member, North Carolina Native Plant Society; 2010

Member, The Orchid Society of America; 2008

Member, American Association for the Advancement of Science; 2013

Member, Botanical Society of America; 2009

Member, Utah Native Plant Society; 2007

SELECTED PROJECT EXPERIENCE

Cedar Creek Anticline Pipeline and Enhanced Oil Recovery Development Project; Wyoming and Montana; Denbury Onshore, LLC. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline (CCA) Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the CCA as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit). Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single National Environmental Policy Act (NEPA) document. *Role: Environmental Technician. Collected vegetation and other field data for greater sage-grouse habitat assessments; surveyed for raptor nests, invasive state noxious weeds, and a Bureau of Land Management (BLM)-sensitive plant (Visher's buckwheat); documented access road conditions; and assisted in wetland delineations.*

Anadarko Uinta Basin Midstream; Uintah County, Utah; Anadarko Petroleum Corporation. SWCA conducted threatened and endangered species clearances, wildlife, paleontological, and cultural surveys to assist Anadarko in the placement of over 300 proposed new and expansion locations of existing oil/natural gas well pads and associated infrastructure throughout Utah. Coordination with the BLM, U.S. Fish and Wildlife Service and tribal governments occurred on several sites. *Role: Environmental Technician. Performed field surveys for rare, BLM-sensitive, or federally-protected plants endemic to the Uintah Basin, such as the Uinta Basin hookless cactus and Pariette cactus.*

Environmental Services TES Surveys; Uintah County, Utah; Confidential. SWCA conducted cultural, paleontological, plant, and wildlife resource surveys as well as compliance monitoring for proposed well locations, access roads, and pipelines. SWCA also produced a final report disclosing the results of the survey. *Role: Environmental Technician. Performed field surveys for rare, BLM-sensitive, or federally-protected plants endemic to the Uintah Basin.*

NEPA Compliance Ute Subdivisions; Uintah County, Utah; Red Plains Professional, Inc. SWCA completed NEPA environmental assessments, archaeological surveys, and surveys for the federally-threatened Ute ladies'-tresses plant for two proposed subdivision sites on Northern Ute tribal lands near Fort Duchesne. *Role: Environmental Technician. Performed field surveys for Ute ladies'-tresses plant.*

Ute Tribe Parking Lot Sites Environmental Assessments and Cultural Resources; Uintah County, Utah; Red Plains Professional, Inc. SWCA completed a NEPA environmental assessment, archaeological survey, and survey for the federally-threatened Ute ladies'-tresses plant for six proposed parking lot sites on Northern Ute tribal lands near Fort Duchesne. *Role: Environmental Technician. Assisted in field surveys for Ute ladies'-tresses plant and data for NEPA environmental assessment.*

JAKE POWELL, B.SC., NATURAL RESOURCES PROGRAM LEAD

Mr. Powell is an ecologist and project manager in SWCA's Sheridan, Wyoming office, where he manages projects, develops business relationships, and provides technical expertise in vegetation, endangered species, reclamation, habitat, National Environmental Policy Act (NEPA) and other environmental regulations and permitting.

Mr. Powell has 17 years of experience in the environmental and biological arenas, working in government and private consulting throughout the western U.S. and Canada, with particular experience in the Great Plains, Rocky Mountains, Great Basin, and Boreal Forest regional areas. He has experience with oil and gas developments, transmission lines, pipelines, highway and bridge construction, stream restoration, land reclamation, stakeholder engagement, rangeland and riparian management, wetlands, conservation projects, and construction environmental inspection.

YEARS OF EXPERIENCE

17

EXPERTISE

Rangeland management

Botany and vegetation ecology

NEPA and regulatory permitting

Threatened and endangered species

Wildlife habitat

Wetlands

Reclamation

Land management

Soils

Stakeholder engagement

EDUCATION

B.Sc., Range Science; Montana State University; Bozeman, Montana; 2005

REGISTRATIONS / CERTIFICATIONS

Certified Professional in Range Management (CPRM); Society for Range Management; 2010

Certified SWPPP Administrator, Montana; Montana Department of Environmental Quality

Professional Agrologist; Government of Alberta; 2012

Professional Biologist; Government of Alberta; 2011

SELECTED PROJECT EXPERIENCE

Cedar Creek Anticline Pipeline and Enhanced Oil Recovery Development Project; Multiple Counties, Wyoming; Denbury Onshore, LLC. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the Cedar Creek Anticline as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit). Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single NEPA document. *Role: Assistant Project Manager/Natural Resources Lead. Responsible for designing and coordinating all natural resource data collection, reporting, and permitting. Managed budget, field teams, and regulatory applications.*

Bell Creek EOR Development Project; Powder River County, Wyoming; Denbury Resources, Inc. SWCA continues to consult with the Bureau of Land Management Miles City Field Office regarding avoidance and mitigation strategies for known biological, cultural, and paleontological features that SWCA crews identified in an EOR project area at the existing Bell Creek oil field in Powder River and Carter Counties, Montana. The EOR development will occur in nine phases, and construction is planned to be completed in all nine phases by 2020. Project-related tasks for SWCA include field surveys, monitoring during construction, reporting, and routing support for all nine phases of the project. SWCA will continue to provide environmental inspection services, including stormwater permitting and inspections as required by the Montana Department of Environmental Quality, during construction. SWCA is also monitoring the entire project area for noxious weeds and coordinating for weed spraying as required. *Role: Assistant Project Manager. Manage the budget, field teams, and client coordination for permitting and construction work; lead wetland, botanical, and wildlife survey work; act as environmental construction inspector.*

Denbury Bell Creek EOR Resource Support; Belle Creek, Powder River County, Montana; AECOM, Inc. SWCA conducted Class I and Class III investigations for an EOR and CO₂ sequestration project covering approximately 20,000 acres parceled into 9 development phases spanning 2010–2015. *Role: Environmental Specialist. Completed the Plan of Development, wetland delineation, and biological resources report.*

Meritage NGL Pipeline Environmental Support; Gillette, Campbell County, Wyoming; Meritage Operating Company, LLC. SWCA is providing natural and cultural resource

TRAINING

Human Resources Management: What Managers Need to Know training, U.S. Forest Service

Conflict Resolution Facilitation training, U.S. Forest Service

Saskatchewan Prairie Conservation Action Plan (PCAP)

Restoration/Reclamation Workshop, Government of Saskatchewan

Certified Professional in Range Management (CPRM), Society of Range Management

Montana Dewatering Permit, Montana DEQ; 2015

Advanced NEPA Effects Analysis training, U.S. Forest Service; 2009

Stephen Covey Leadership Seminar, Private; 2004

Dealing with Difficult People training, U.S. Forest Service

Conflict Management training, US Forest Service

Waterways Construction Permitting and Practices, Montana DEQ; 2015

Montana DEQ BMP 101: SWPPP BMP training, Altitude Training; 2014

Riparian and Wetland Proper Functioning Condition training, U.S. Bureau of Land Management; 2005

BLM NEPA Training, U.S. Bureau of Land Management & SWCA; 2014

Montana DEQ Water Crossing & Discharge Permit training, MT DEQ; 2015

Montana DEQ BMP 201: SWPPP Administrator, Altitude Training and MT DEQ; 2014

MEMBERSHIPS

Member, Society of Range Management; 2001

Member, The Wildlife Society; 2011

services for an approximately 300-mile-long oil and gas pipeline gathering system in eastern Wyoming. Desktop analyses and field surveys are performed in support of federal and state regulatory compliance and permitting needs, including U.S. Army Corps of Engineers nationwide permitting and U.S. Fish and Wildlife Service compliance. *Role: Natural Resources Lead. Provided technical expertise in endangered species, migratory birds, sage-grouse, wetlands, and other natural resources. Completed senior review of agency documents and permitting.*

Golden Grizzly Cultural and Natural Surveys; Converse County, Wyoming; SM Energy Company. SWCA is providing natural and cultural resource services, including Class I and Class investigations, and permitting support for approximately 75 proposed federal wells, flow lines, and associated infrastructure for oil exploration and extraction from the Niobrara Formation in eastern Wyoming. SWCA is conducting field surveys, monitoring protected resources as required, and writing technical reports in support of federal permitting. *Role: Environmental Specialist. Responsible for quality assurance and control (QA/QC) of reports and field work and providing regulatory guidance.*

Vermilion Energy East Finn Project; Confidential County, Wyoming; Vermilion Energy USA, LLC. SWCA conducted a pre-field analysis of existing data (e.g. geologic map review, previous locality search, literature review), field surveys, fossil collection; communicated and consulted with federal agencies (e.g. U.S. Forest Service and Bureau of Land Management); and completed survey reports, which summarized the pre-field and field results and included recommendations for the construction phase of the project. *Role: Environmental Specialist. Responsible for QA/QC of reports and field work and providing regulatory guidance.*

North Dakota Permitting and NEPA Compliance; Dunn County, North Dakota; Enerplus Resources. SWCA conducted general wildlife and vegetation field surveys, with an emphasis on migratory birds and raptors, for oil and gas development in North Dakota. Additionally, SWCA was responsible for ensuring environmental compliance and preparing environmental assessments and other NEPA documents. *Role: Environmental Specialist. Responsible for Biological Assessment review.*

Riley Ridge to Natrona Pipeline - 2015; Multiple Counties, Wyoming; Denbury Resources, Inc. SWCA provided all applicant-side environmental permitting, including writing/submitting the Plan of Development and Resource Reports, field surveys and reporting for biological, cultural, and paleontological resources, stormwater permitting, noxious weed monitoring and spraying, and NEPA assistance. *Role: Natural Resources Lead. Provided technical expertise in endangered species, migratory birds, sage-grouse, wetlands, and other natural resources. Completed senior review of agency documents and permitting.*

City of Sheridan Ecosystem Inventory and Habitat Delineation; Sheridan County, Wyoming; City of Sheridan. SWCA conducted a feasibility study, under Section 1135 of the Water Resources Development Act of 1986, to develop options for restoration of Big Goose and Little Goose Creeks. The study included completing inventories of wildlife habitat, wetlands, vegetation communities, and individual flora and fauna. *Role: Project Manager. Provided technical guidance, budget management, and oversight of regulatory documents.*

Seminole Casper Reroute Stormwater Pollution Prevention Plans Inspections; Casper, Natrona County, Wyoming; Phillips 66 Company. SWCA provided a desktop analysis for two reroutes. *Role: Project Manager. Responsible for QA/QC of reports and field work, providing regulatory guidance, and performing field work.*

DEREK REDDING, B.A., ENVIRONMENTAL SPECIALIST

Mr. Redding provides environmental monitoring and compliance services in support of oil and natural gas services in the Marcellus and Utica Shale plays of Pennsylvania, West Virginia and Ohio. Mr. Redding's experience includes erosion and sediment control inspection and documentation, scientific data collection, wetland delineation per the protocols outlined in the 1987 U.S. Army Corps of Engineers Wetland Delineation Manual - Eastern Mountains and the Piedmont Regional Supplement, technical report production and database management. Mr. Redding is also responsible for field crew safety, scientific data management, field coordination and equipment maintenance.

YEARS OF EXPERIENCE

4

EXPERTISE

Stream Mitigation

Air Quality

Environmental Monitoring

Technical Data Management

Phase I Environmental Assessments

Environmental Data Management & Compliance Reporting (ERIMS) Online Database

EDUCATION

B.A., Environmental Studies; University of Pittsburgh; Bradford, Pennsylvania; 2013

A.A., Petroleum Technology; University of Pittsburgh; Bradford, Pennsylvania; 2013

REGISTRATIONS / CERTIFICATIONS

LDAR (Leak Detection and Repair) Specialist

TRAINING

40 Hour Training, Mine Safety and Health Administration

Method 21 Leak Detection and Repair Certification, Environmental Rental LLC

MEMBERSHIPS

Member, Marcellus Shale Coalition

SELECTED PROJECT EXPERIENCE

Cedar Creek Anticline Pipeline and Enhanced Oil Recovery Development Project; Multiple Counties, Wyoming; Denbury Onshore, LLC. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the Cedar Creek Anticline as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit). Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single National Environmental Policy Act document. *Role: Environmental Specialist. Conducted wetland delineations and Waters of the U.S. surveys. Also conducted sage-grouse habitat surveys.*

Clarrington Hub Habitat Assessment/Cultural Resource Survey; Monroe County, Ohio; Tallgrass Energy Partners, LP. SWCA provided biological and cultural surveys, including a Phase I Habitat Assessment for the Indiana Bat, and obtained all appropriate concurrences from regulating agencies including U.S. Fish and Wildlife Service and the U.S. Army Corps of Engineers. SWCA prepared a Federal Energy Regulatory Commission Blanket Prior Notice and resource reporting as well as an environmental assessment for the project. *Role: Environmental Technician. Conducted biological and cultural surveys, including a Phase I Habitat Assessment for the Indiana Bat.*

Garden Creek Loop NGL Cultural and Natural Resource Services; McKenzie County, North Dakota; Merjent, Inc. SWCA conducted cultural and natural resource studies on the Garden Creek Natural Gas Liquids Loop. *Role: Environmental Specialist. Conducted wetland delineations and Waters of the U.S. surveys. Also conducted migratory bird habitat surveys.*

Kinder Morgan Utopia Pipeline Projects; Fulton and Harrison Counties, Ohio; Kinder Morgan, Inc. The project involves the construction of an underground pipeline to convey natural gas product. *Role: Environmental Technician. Conducted biological and cultural surveys, including wetland delineations / waters of the U.S. surveys and Phase I archaeological surveys.*

KMI Newfield Phase3 Natural Resource Services; McKenzie County, North Dakota; Kinder Morgan, Inc. SWCA conducted a wetland delineation and migratory bird surveys. *Role: Environmental Specialist. Conducted wetland delineations and Waters of the U.S. surveys. Also conducted migratory bird habitat surveys.*

Lynn Camp Environmental Services; Ritchie County, West Virginia; Antero Resources. SWCA provided environmental services for a well pad development. *Role: Environmental Technician. Conducted biological and cultural surveys, including a Phase I Habitat*

Assessment for the Indiana Bat.

McKenzie Electric - Transmission to XTO & QEP Well Pads; Dunn County, North Dakota; Uintah Engineering & Land Surveying, LLC. SWCA prepared a National Environmental Policy Act Addenda for several environmental assessments to include buried transmission lines in previously approved right-of-ways on the Fort Berthold Indian Reservation. *Role: Environmental Specialist. Conducted wetland delineations and Waters of the U.S. surveys. Also conducted migratory bird habitat surveys.*

Midland to Sealy Pipeline Surveys and Permitting Segment 4; Multiple Counties, Texas; Enterprise Products Operating, LLC. SWCA provided full environmental surveys and permitting services on a proposed 400-mile-long crude oil pipeline. SWCA also completed a constraints analysis of the proposed route, followed by natural and cultural resource surveys, and ended with U.S. Army Corps of Engineers permitting and obtaining other agency authorizations, as necessary. *Role: Environmental Specialist. Conducted wetland delineations and Waters of the U.S. surveys. Also conducted Black-capped Vireo and Golden-cheeked Warbler habitat assessments.*

Non-Native Species Removal for the City of New Braunfels; New Braunfels, Comal County, Texas; City of New Braunfels. SWCA removed four non-native species from Landa Lake as part of the Edwards Aquifer Authority Habitat Conservation Plan. Species removed include tilapia, sailfin catfish, giant ramshorn snail, and nutria. *Role: Environmental Specialist. Conducted species removal by trapping, netting and spear-fishing.*

Rockies Express East Loop Pipeline Feasibility Study; Multiple Counties, Multiple States; Tallgrass Operations, LLC. SWCA conducted natural resources field investigations on an approximate 300-mile natural gas pipeline project. Tasks included coordination of field efforts between multiple consulting firms, regulatory agency outreach presenting the project, and field efforts being utilized at an early stage in the study. *Role: Environmental Technician. Conducted wetland delineations and Waters of the U.S. surveys.*

REX Seneca Construction Biology Services; Noble County, Ohio; Tallgrass Energy Partners, LP. SWCA performed biological inventories/assessments along a proposed pipeline route in order to establish if threatened and endangered species or indicator species were present. SWCA provided permitting for wetland assessment, for the Federal Energy Regulatory Commission-administered Rex Seneca Project, according to the Ohio Rapid Assessment Methodology as well as stream crossing permits (Section 404 permit from the U.S. Army Corps of Engineers and a Section 401 Water Quality Certification from the State of Ohio) with the U.S. Army Corps of Engineers and the Ohio Environmental Protection Agency. *Role: Environmental Technician. Conducted on site environmental inspection services.*

Robinson Fork Water Pipeline Wetland Delineation; Washington County, Pennsylvania; Noble Energy, Inc. SWCA conducted a wetland delineation for a water pipeline project. *Role: Environmental Technician. Conducted wetland delineations and Waters of the U.S. surveys.*

SHL25 Tank Pad Development; Marshall County, West Virginia; Noble Energy, Inc. SWCA prepared environmental permitting for well pad locations. *Role: Environmental Technician. Conducted wetland delineations and Waters of the U.S. surveys.*

Sunrise Pipeline Erosion and Sediment Control; Multiple Counties, Multiple States; Sunrise Pipeline, LLC. SWCA is contracted to provide on-call environmental services. *Role: Environmental Technician. Conducted environmental monitoring and compliance services.*

Sunrise Post-construction Environmental Services; Multiple Counties, Multiple States; Sunrise Pipeline, LLC. SWCA developed a Wetland Mitigation Plan and is providing monitoring of the restoration of upland areas and wetlands over a 3- to 5-year period. SWCA has provided monitoring, mitigation, and reporting services for the project including reports and Self-Certification forms to the U.S. Army Corps of Engineers, reports to Federal Energy Regulatory Commission, PAGSP-4 permits and Nationwide 12 in conjunction with Section 404 and 401 permitting. *Role: Environmental Technician. Conducted environmental monitoring and compliance services.*

PEGGY ROBERTS, M.S., SENIOR NEPA PROJECT MANAGER

As a Senior National Environmental Policy Act (NEPA) Project Manager, Ms. Roberts serves in a management role on large-scale NEPA projects across several industries including transmission and power generation, oil and gas pipelines, renewable generation, and mining to comply with the NEPA. She has extensive experience preparing environmental impact statements and environmental assessments working with multiple federal agencies including the Bureau of Land Management (BLM), Western Area Power Administration, the U.S. Department of Agriculture Rural Utilities Services, U.S. Army Corps of Engineers, and the U.S. Fish & Wildlife Service throughout the western U.S., as well as Alaska, North Dakota, and Texas. Ms. Roberts has prepared state Public Utility Service Commission applications in Texas, Nevada, and North Dakota for transmission line and oil and gas pipeline development projects. Additionally, her expertise includes planning and implementing public outreach/public participation programs for major infrastructure projects in support of the NEPA process.

YEARS OF EXPERIENCE

22

EXPERTISE

NEPA Compliance

Public Participation

Oil and Gas Pipelines

Transmission Line/Power Generation Permitting

Renewable Energy

EDUCATION

M.S., Public Communications and Technology; Colorado State University; 2013

B.J. Journalism/Public Relations; University of Texas at Austin; 1997

REGISTRATIONS / CERTIFICATIONS

Certification in Public Participation; 2005

TRAINING

Systematic Development of Informed Consent, Public Participation Institute; 2011

SELECTED PROJECT EXPERIENCE

Cedar Creek Anticline Pipeline and Enhanced Oil Recovery Development Project; Multiple Counties, Wyoming; Denbury Onshore, LLC. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the Cedar Creek Anticline as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit). Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single NEPA document. *Role: Environmental Specialist. Preparation of pipeline Plan of Development (POD) and EOR field development POD; provided senior review of supplemental reports.*

Bell Creek EOR Development Project; Powder River County, Wyoming; Denbury Resources, Inc. SWCA continues to consult with the BLM Miles City Field Office regarding avoidance and mitigation strategies for known biological, cultural, and paleontological features that SWCA crews identified in an EOR project area at the existing Bell Creek oil field in Powder River and Carter Counties, Montana. The EOR development will occur in nine phases, and construction is planned to be completed in all nine phases by 2020. Project-related tasks for SWCA include field surveys, monitoring during construction, reporting, and routing support for all nine phases of the project. SWCA continues to provide environmental inspection services, including stormwater permitting and inspections as required by the Montana Department of Environmental Quality, during construction. SWCA is also monitoring the entire project area for noxious weeds, and coordinating for weed spraying as required. *Role: Project Manager. Provided senior-level review.*

Riley Ridge to Natrona Pipeline; Multiple Counties, Wyoming; Denbury Resources, Inc. SWCA began providing cultural and natural resource services for a 243-mile CO₂ pipeline in central Wyoming in 2012 and will continue to provide these services through all phases of the project up to its completion. Tasks include field surveys, preparation of environmental and cultural resources documentation in support of BLM right-of-way grant application and Clean Water Act Section 404 permitting and Endangered Species Act compliance. *Role: Planning Specialist. Assisted in a support and document review role to the BLM and Denbury Resources for preparation of environmental and cultural resources and applicant-side public participation.*

Riley Ridge to Natrona Pipeline - 2015; Multiple Counties, Wyoming; Denbury Resources, Inc. SWCA provided all applicant-side environmental permitting, including writing/submitting the POD and resource reports, field surveys and reporting for biological, cultural, and paleontological resources, stormwater permitting, noxious weed monitoring and spraying, and NEPA assistance. *Role: Environmental Specialist. Provided senior-level review and applicant-side public involvement coordination.*

Riley Ridge Unit Development; Multiple Counties, Wyoming; Denbury Resources, Inc. SWCA performed natural and cultural resource surveys on BLM lands as part of work for Denbury's proposed project in the Riley Ridge Unit in the LaBarge Anticline oil and gas field located in southwest Sublette County, Wyoming. Tasks included field surveys, preparation of environmental and cultural resources documentation in support of BLM right-of-way grant application, Clean Water Act Section 404 permitting, and Endangered Species Act compliance. *Role: Project Manager. Provided senior-level review, assisted in visual resource analysis.*

Riley Ridge Unit Development 2015; Multiple Counties, Wyoming; Denbury Resources, Inc. SWCA provided all applicant-side environmental permitting, including writing/submitting the POD and resource reports, environmental inspection during construction, field surveys and reporting for biological, cultural, and paleontological resources, stormwater permitting, noxious weed monitoring and spraying, and NEPA assistance for a proposed gas well drilling development project. *Role: Project Manager. Provided senior-level review, assisted in visual resource analysis.*

Sabine Pass Phase 3 Creole Trail Pipeline Extension and Expansion; Multiple Parishes, Louisiana; Cheniere Energy, Inc. SWCA assisted with permitting for a proposed approximately 100-mile pipeline in Texas. *Role: Environmental Specialist. Provided senior-level review of alternatives analysis.*

Sacagawea Pipeline; Multiple Counties, North Dakota; Paradigm Energy Partners, LLC. SWCA conducted natural resource surveys for a pipeline project and associated gathering lines on private and U.S. Forest Service lands. *Role: Environmental Specialist. Provided senior-level review of Public Service Commission application.*

JOE SCHROEDER, B.S., NATURAL RESOURCE SPECIALIST

As a natural resource specialist, Mr. Schroeder performs wetland delineations, plant and wildlife surveys, vegetative sampling and community mapping, stormwater pollution prevention plan (SWPPP) inspections, and Environmental Site Assessments for infrastructure work in support of the National Environmental Policy Act (NEPA), Section 404 of the Clean Water Act (CWA), and the Endangered Species Act (ESA).

With extensive professional experience working on environmental projects in coastal, temperate, montane, island, semi-arid, and arid environments for both the public and private sector, in over 14 states in the western U.S., he is proficient at developing and leading complex wetland delineation, ecological restoration, vegetative community mapping, and plant and wildlife survey and inventory projects. Mr. Schroeder is also skilled at streamlining project execution through the integration of advanced geographic information systems (GIS) concepts and design and accustomed to carrying projects through from planning through submittal stage.

YEARS OF EXPERIENCE

10

EXPERTISE

Vegetative community mapping
Wetland delineation
Vegetation sampling
Rare plant and floristic surveys
Ecological restoration design
Report Writing/Coordinating/Editing
ArcGIS Design/Collection/Analysis

EDUCATION

B.S., Rangeland Ecology & Management; Colorado State University; 2007

A.S., Wildlife Biology; College of DuPage; 2002

TRAINING

Unexploded Ordinance Training, U.S. Department of Defense; 2007

Interpreting Indicators of Rangeland Health, U.S. Department of Agriculture, Agricultural Research Service, National Resources Conservation Service; 2007

Bryophyte ID Workshop, Sobe Free; 2009

Lab Standard, Jornada Exp. Range; 2007

SELECTED PROJECT EXPERIENCE (* denotes project experience prior to SWCA)

Cedar Creek Anticline Pipeline and Enhanced Oil Recovery Development Project; Wyoming and Montana; Denbury Onshore, LLC. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline (CCA) Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the CCA as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit). Permitting includes applying for a generic Application for Permit to Drill (APD) that coincides with the pipeline right-of-way (ROW) application for each separate identified field. The pipeline and the fields will be analyzed under a single NEPA document. *Role: Environmental Specialist. Conducted wetland delineations and collected the necessary supporting documentation to acquire required permits for impacts to potential Waters of the U.S. Collected quantitative vegetation sampling to establish baseline ecological conditions of the study area and collected qualitative habitat assessments to support the development of greater sage-grouse habitat modeling.*

Bell Creek EOR Development Project; Wyoming and Montana; Denbury Resources, Inc. SWCA continues to consult with the Bureau of Land Management (BLM) Miles City Field Office regarding avoidance and mitigation strategies for known biological, cultural, and paleontological features that SWCA crews identified in an EOR project area at the existing Bell Creek oil field in Powder River and Carter Counties, Montana. The EOR development will occur in nine phases, and construction is planned to be completed in all nine phases by 2020. Project-related tasks for SWCA include field surveys, monitoring during construction, reporting, and routing support for all nine phases of the project. SWCA continues to provide Environmental Inspection services, including stormwater permitting and inspections as required by the Montana Department of Environmental Quality, during construction. SWCA is also monitoring the entire project area for noxious weeds, and coordinating weed spraying as required. *Role: Environmental Specialist. Led a team performing Waters of the U.S. field mapping and worked as a member of the team conducting rare plant surveys, nest surveys, and wildlife surveys.*

Big Metal Coal Soil and Vegetation Surveys; Big Horn County, Montana; Cloud Peak Energy Resources LLC. SWCA conducted wetland, soils, and vegetation baseline surveys in support of the Big Metal Project. *Role: Environmental Specialist. Led field efforts associated*

with wetland delineations, rare plant surveys, and vegetation sampling.

Denbury Bell Creek APD Permitting; Belle Creek, Multiple States; Denbury Onshore, LLC. SWCA is preparing federal and state APD packages for approximately 30 oil and CO₂ injection wells in Denbury's Bell Creek Field and follows them through to approval in conjunction with SWCA's cultural, paleontological, wetland and sensitive species resource work. *Role: Environmental Specialist. Conducted wetland delineations, raptor nest surveys, and rare plants surveys and completed the accompanying reporting requirements necessary to meet regulatory requirements of development of the Bell Creek APD.*

Greencore CO₂ Pipeline Project; Multiple Counties, Wyoming; Denbury Resources, Inc. SWCA consulted with the BLM Casper Field Office regarding avoidance and mitigation strategies for known biological, cultural, and paleontological features that SWCA crews identified in the project area for a 231-mile-long CO₂ pipeline between the ConocoPhillips Lost Cabin Gas Plant in Fremont County, Wyoming, and a point in the Bell Creek oil field in Powder River County, Montana. The CO₂ transported by the pipeline will be used for EOR at the existing Bell Creek oil field. SWCA is responsible for monitoring the entire project area for noxious weeds, and coordinating for weed spraying as needed. SWCA is also conducting the fieldwork, reporting, and agency consultation for the annual post-construction ROW monitoring until success criteria have been met. *Role: Environmental Specialist. Led a team that conducted revegetation success and SWPPP assessments.*

Meritage NGL Pipeline Environmental Support; Gillette, Campbell County, Wyoming; Meritage Operating Company, LLC. SWCA is providing natural and cultural resource services for an approximately 300-mile-long oil and gas pipeline gathering system in eastern Wyoming. Desktop analyses and field surveys are performed in support of federal and state regulatory compliance and permitting needs, including U.S. Army Corps of Engineers nationwide permitting and U.S. Fish and Wildlife Service compliance. *Role: Environmental Specialist. Led a team performing Waters of the U.S field mapping and worked as a member of the team conducting rare plant surveys, nest surveys, and wildlife surveys.*

North Platte Environmental Restoration Master Plan; Casper, Natrona County, Wyoming; Stantec, Inc. Stantec and SWCA teamed together to provide an Environmental Restoration Master Plan. This master plan provided an assessment of the existing morphology and riparian vegetation conditions of a proposed channel and riparian restoration strategies for the North Platte River in a 13.5-mile stretch that flows through the City of Casper, the Town of Mills, and Natrona County. Following completion of the Master Plan, six project areas were identified and taken to the final design stages. SWCA conducted aquatic resource inventories, cultural surveys, revegetation planning, and permitting services in support of the development of the final restoration design. *Role: Environmental Specialist. Mr. Schroeder worked as a member of a team that conducted wetland and other Waters of the U.S. mapping in support of the Environmental Restoration Master Plan and developed the associated Aquatic Resource Inventory report for review by the U.S. Army Corps of Engineers.*

Golden Grizzly Cultural and Natural Surveys; Converse County, Wyoming; SM Energy Company. SWCA is providing natural and cultural resource services, including Class I and Class investigations, and permitting support for approximately 75 proposed federal wells, flow lines, and associated infrastructure for oil exploration and extraction from the Niobrara Formation. SWCA is conducting field surveys, monitoring protected resources as required, and writing technical reports in support of federal permitting. *Role: Environmental Specialist. Conducted wetland delineations, raptor nest surveys, and rare plants surveys and completed the accompanying reporting requirements necessary to meet regulatory requirements.*

Vermilion Energy East Finn Project; Confidential County, Wyoming; Vermilion Energy USA, LLC. SWCA conducted a pre-field analysis of existing data (e.g. geologic map review, previous locality search, literature review), field surveys, fossil collection; communicated and consulted with federal agencies (e.g. U.S. Forest Service and BLM); and completed survey reports, which summarized the pre-field and field results and included recommendations for the construction phase of the project. *Role: Environmental Specialist. Led a team performing Waters of the U.S field mapping and worked as a member of the team conducting rare plant surveys, nest surveys, and wildlife surveys.*

***White River National Forest Floristic and Rare Plant Surveys; Rifle, Colorado; Xcel Energy.** Floristic and rare plant surveys along Xcel Energy power lines running through the White River National Forest, Colorado. *Role: Environmental Specialist. Led a team conducting rare plant surveys and vegetation sampling.*

***Rare Plant Surveys and Floristic Surveys; Wyoming; Wyoming Army National Guard.** Rare plant surveys, floristic surveys, and reporting on three Wyoming Army National Guard bases in western and northern Wyoming, comprising a total area of approximately 80,000 acres. *Role: Project Lead. Led rare plant surveys, floristic surveys, and reporting.*

Paul M. Swartzinski

Ecologist

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Professional History

Education

MS, Restoration Ecology, Colorado State University

BS, Rangeland Ecology, Colorado State University

Years of Experience

With Bluestem Consulting: 3

With AECOM: 7

With Other Firms: 8

Technical Specialties

Baseline & Benchmark Field Studies

Environmental Impact Assessment & Statements

Federal, State, Province & Local Regulatory Interface & Negotiation

Major Capital Projects Permitting

Natural Resources Management

Training and Certifications

Ute Ladies' tresses orchid (*Spiranthes diluvialis*) Certification from USFWS

Wetland Delineation Course for USACE Certification, 2006

First Aid / CPR

USACE Regional Supplement Seminar and Field Practicum for the Great Plains, Arid West and Western Mountains, Valleys and Coast Regions

Hazardous Waste Operations and Emergency Response training (HAZWOPER), per OSHA Standard 1910.120

Mr. Swartzinski is a plant ecologist and field biologist with over 21 years of experience with environmental permitting and compliance, biological field surveys, and spatial data analysis. He has conducted vegetation sampling, and sensitive species surveys, wetland delineations, noxious and invasive species surveys for several projects, including transmission lines, pipelines, wind energy projects, and solar projects in Alaska, Arizona, Colorado, Illinois, Missouri, Montana, Nebraska, Nevada, North Dakota, New Mexico, South Dakota, Washington, Wyoming, and Utah. Mr. Swartzinski has prepared Environmental Impact Statements (EISs), Environmental Assessments (EAs), and Federal Energy Regulatory Commission (FERC) Resource Reports for transmission lines, mining, natural gas field development projects, natural gas and natural gas liquids pipeline projects, and oil pipeline projects. He has prepared wetland delineations reports, wetland easement applications, and Section 401 and 404 permit applications for the U.S. Army Corps of Engineers Sacramento District (Grand Junction Field Office), Omaha District (Cheyenne and Denver Field Offices), St. Louis District (Kansas City Field Office) and other state and local agencies. Prior to his work with AECOM and Bluestem Consulting, he worked for the Natural Resource Restoration Ecology Laboratory at Colorado State University, and served as the Director of The Murulle Foundation for 12 years (A non-profit organization concerned with conserving the balance between cultural and natural resources in sub-Saharan Africa).

He has experience working on projects in compliance with the National Environmental Policy Act (NEPA), and with the Bureau of Land Management (BLM), US Fish and Wildlife Service (USFWS), USDA Forest Service (USFS), and US Army Corps of Engineers (USACE). He is also knowledgeable of the National Environmental Policy Act and Endangered Species Act as they relate to regulatory processes.

Representative Experience

Pipelines / Oil and Gas

Lobos CO₂ Pipeline Project, Arizona and New Mexico. Biological technical lead for environmental surveys along the proposed pipeline route. Surveys included wetland and waterbody delineations, threatened and endangered species habitat identification, and identification of vegetation communities impacted by the proposed route.

EXP Delaware Basin Pipeline Project, New Mexico. Biological technical lead for environmental surveys along the proposed pipeline route. Surveys included wetland and waterbody delineations, threatened and endangered species habitat identification, and identification of vegetation communities impacted by the proposed route.

Parsons Brinckerhoff NMDOT U.S. Highway 82 Biological Evaluation Project, New Mexico. Biological technical lead for environmental surveys along the proposed pipeline route. Surveys included wetland and waterbody delineations, threatened and endangered species habitat identification, and identification of vegetation communities impacted by the proposed route.

Arizona Public Service Company (APS) Transmission Line Project, New Mexico, Arizona and Utah. Botanical technical lead for rare plant surveys along the proposed transmission line route. Conducted rare plant surveys for numerous plant species of concern including; Fickeisen's Plains Cactus (*Pediocactus peeblesianus* var. *fickeiseniae*), Mancos Milk-vetch (*Astragalus humillimus*), Mesa Verde Cactus (*Sclerocactus mesae-verdae*), Naturita Milk-vetch (*Astragalus naturitensis*), Round Dunebroom (*Errazurizia rotundata*), Jones cycladenia (*Cycladenia humilis* var. *jonesii*), and San Rafael Cactus (*Pediocactus despainii*).

Bureau of Land Management, Greencore CO₂ Pipeline Project Permitting, Wyoming, Montana. Biological technical lead for the environmental permitting of the Greencore CO₂ Pipeline Project. Lead biologist for all aspects of the environmental field survey program for Denbury Resources Inc. along this 232-mile-long pipeline project through central Wyoming and southeast Montana. Surveys included wetland and waterbody delineations, threatened and endangered species habitat identification, and identification of vegetation communities impacted by the proposed route. Provided guidance on pipeline routing, as well as agency correspondence with BLM and U.S. Fish and Wildlife Service regarding threatened and endangered species issues (including protection zones, exclusion windows, mitigation measures, etc).

Bureau of Land Management and Denbury Onshore, LLC, Bell Creek Field Enhanced Oil Recovery Project Environmental Assessment (Phases 1-9), Powder River County, Montana. Biological technical lead for preparation of an Environmental Assessment (EA) to evaluate the potential impacts of a proposed enhanced oil recovery (EOR) project in the Bell Creek Field. Major project components to be analyzed include wells, well pads, access roads, gathering lines, power lines, fluids processing facility, and a gas compression facility. Important EA issues include maximizing use of previously disturbed areas to reduce the impact of the project footprint, raptor habitat, big game winter range, Migratory Bird Treaty Act (MBTA) nesting requirements, potential sage-grouse and sharp-tailed grouse habitat, and water resources. Conducted greater sage-grouse and sharp-tailed grouse helicopter surveys. Developed threatened and endangered vegetation models to conduct ground surveys for BLM and Federally protected species.

Denbury Resources Inc., Riley Ridge CO₂ Pipeline Project, Wyoming. Biological technical lead. Denbury Resources Inc. (DRI) has proposed a 250-mile 24- to 30-inch pipe transporting carbon dioxide for enhanced oil recovery in southeast Montana. Supported DRI with desktop analysis, agency consultations, centerline routing, and environmental surveys. Surveys include threatened and endangered species, special status plants, wetland and waterbody delineation, avian surveys and noxious weeds. Species specific surveys completed: rare plants, wetland/waterbody delineation, sage-grouse, pygmy rabbit habitat, raptors, burrowing owls, prairie dogs, and mountain plover.

Western Energy Company. Montana. Conducted baseline vegetation surveys for proposed coal mining impact. Conducted baseline vegetation studies within and adjacent to the potential disturbance footprint that included seven vegetation communities: 1) short-grass prairie, 2) mountain mahogany shrubland, 3) limber pine woodland, 4) aspen/limber pine woodland, 5) limber pine savannah, 6) low sage/cushion plant, 7) big sagebrush steppe (minor community), and 8) rock outcrop/thin grassland. Conducted rare plant surveys within project area. Also

conducted vegetation surveys within reclaimed coal mining operations.

Bureau of Land Management, Overland Pass Pipeline Co. LLC, Overland Pass Pipeline Project, Colorado and Wyoming. Botanical technical lead for preparation of the Biological Assessment (BA) for the proposed action to meet federal requirements and agreements by the USFWS as well as the BLM. It addressed federally listed threatened and endangered, candidate, and proposed species and was prepared under the 1973 ESA Section 7 regulations, in accordance with the 1998 procedures set forth by USFWS and the National Marine Fisheries Service (NMFS), and in accordance with the 1994 and 2000 MOU and MOA, respectively. The Overland Pass Pipeline Company constructed a 110-mile-long interstate natural gas liquids (NGL) transmission pipeline from the Piceance Basin, Colorado, terminating at existing storage and processing facilities in Wyoming.

BakkenLink Pipeline LLC (BakkenLink) Crude Oil Pipeline Project Third Party Environmental Assessment, North Dakota. Botanical technical lead for preparation of the Biological Assessment (BA) and Biological Evaluation (BE) for the proposed action to meet federal requirements and agreements by the USFWS, the BLM, and the USFS. The BA/BE determined whether the Project would result in impacts to federally listed or proposed species or their critical habitat. The BakkenLink Pipeline Project, proposed by BakkenLink Pipeline, LLC, consists of constructing approximately 130 miles of 8- and 12-inch-diameter steel crude oil pipeline and associated infrastructure extending from multiple truck receipt facilities in Billings, Williams, McKenzie, and Stark Counties, North Dakota, to a delivery point interconnect with a rail facility that is being built by Great Northern Midstream LLC near Fryburg, North Dakota, and/or the Beaver Lodge Truck Receipt Facility near Beaver Lodge, North Dakota. .

Exxon Mobil and TransCanada, Alaska Pipeline Project, Alaska. Completed wetland/waterbody delineations for 800-mile linear permitting pipeline project following U.S. Army Corps of Engineers guidelines. Utilized the AECOM proprietary EMAP software for mapping and data collection.

Kinder Morgan, Rockies Express-West Pipeline, Colorado, Wyoming, Nebraska, Kansas, and Missouri. Conducted biological surveys for a linear permitting project including threatened and endangered species, avian surveys and noxious weeds. Species surveys included: greater sage-grouse, Indiana bat, Massasauga rattlesnake, swift fox, raptors, burrowing owls, prairie dogs, and mountain plover. Rare plant species surveyed included: running buffalo clover (*Trifolium stoloniferum*), small white lady's slipper (*Cypripedium candidum*) and western prairie fringed orchid (*Platanthera praeclara*). Also completed wetland/ waterbody delineations for the 800-mile linear pipeline permitting project following U.S. Army Corps of Engineers guidelines.

Questar, Rendevous VI Pipeline, Wyoming. Conducted threatened and endangered species surveys for the project. Surveys included: beaver rim phlox (*Phlox pungens*), cedar rim thistle (*Cirsium aridum*), large-fruited bladderpod (*Lesquerella macrocarpa*), meadow pussytoes (*Antennaria corymbosa*), Trelease's racemosa milkvetch (*Astragalus racemosus* var. *treleasei*), and tufted twinpod (*Physaria condensate*). Also conducted greater sage-grouse habitat surveys for the project.

TransCanada, Bison Pipeline Threatened and Endangered Species Surveys, Wyoming. Conducted blowout penstemon (*Penstemon haydenii*) and Ute Ladies' tresses orchid (*Spiranthes diluvialis*) surveys for the proposed Bison Pipeline

Project. Co-authored report to the U.S. Fish and Wildlife Service and Bureau of Land Management summarizing Ute Ladies' tresses orchid field survey results.

TransCanada, Keystone Pipeline, LLC, Keystone Pipeline Project Department of State Filing and Other Permitting, Midwestern United States (North Dakota, South Dakota, Nebraska, Kansas, Missouri, Illinois, and Oklahoma). Botanist and wetland survey coordinator for an approximately 1,078-mile crude oil pipeline running from the Canada/North Dakota border to terminals existing in the Midwest. Tasks included assisting in preparation of the environmental report and biological assessment that included 22 federally listed or candidate species; conducting native prairie surveys; surveying woodlots, windbreaks, and wooded riparian areas in North Dakota; preparing a Wetlands Delineation Report and Pre-Construction Notification package for U.S. Army Corps of Engineers districts along the route; and assisting in assembling the related necessary state and federal permits for the project. Conducted threatened and endangered species surveys for the Keystone Pipeline Project. Species surveys include: Indiana bat, Massasauga rattlesnake, swift fox, raptors, burrowing owls, prairie dogs, and mountain plover. Completed wetland/waterbody delineations for permitting pipeline project following U.S. Army Corps of Engineers guidelines.

TransCanada, Keystone XL Pipeline, Department of State Filing and Other Permitting, Midwestern U.S. (Montana, South Dakota, and Nebraska).

Conducted biological surveys for a linear permitting project, including threatened and endangered species, avian surveys and noxious weeds. Species surveys completed: sage-grouse, swift fox, raptors, burrowing owls, prairie dogs, and mountain plover. Conducted aerial surveys for greater sage-grouse leks, sharp-tailed grouse leks and raptor nests. Rare plant species surveyed for include: small white lady's slipper (*Cypripedium candidum*) and western prairie fringed orchid (*Platanthera praeclara*). Conducted aerial surveys for sage-grouse and sharp-tailed grouse leks, as well as raptor nests. Also completed wetland/waterbody delineations for 950-mile linear permitting pipeline project following United States Army Corps of Engineers guidelines.

Wyoming Interstate Co., Kanda Lateral Pipeline Federal Energy Regulatory Commission Filing and Other Permitting, Utah and Wyoming. Conducted threatened and endangered species surveys for the Kanda Lateral Pipeline project. Species surveys include: greater sage-grouse, swift fox, raptors, burrowing owls, prairie dogs, and mountain plover. Rare plant species surveyed include: park rockcress (*Arabis vivariensis*), Hamilton's milkvetch, (*Astragalus hamiltonii*), Nelson's milkvetch (*Astragalus nelsonianus*), Ownbey's thistle (*Cirsium ownbeyi*), Goodrich cleomella (*Cleomella palmeriana* ssp. Goodrichii), alcove bog-orchid (*Habenaria zothecina*), stemless beardtongue (*Penstemon acaulis* ssp. Acaulis), Gibben's beardtongue (*Penstemon gibbensii*), Uinta Basin hookless cactus (*Sclerocactus glaucus*), and Ute Ladies' tresses orchid (*Spiranthes diluvialis*). Also completed wetland/waterbody delineations for 153-mile linear permitting pipeline project following United States Army Corps of Engineers guidelines.

Wyoming Interstate Co., Kanda Mid-Point Compressor Station, Utah.

Conducted threatened and endangered species surveys for the Kanda Mid-Point Compressor Station project. Species surveys include: greater sage-grouse, swift fox, raptors, burrowing owls, prairie dogs, and mountain plover.

Mining

Western Energy Company. Montana. Conducted baseline vegetation surveys for proposed coal mining impact. Conducted baseline vegetation studies within and adjacent to the potential disturbance footprint that included seven vegetation communities: 1) short-grass prairie, 2) mountain mahogany shrubland, 3) limber pine woodland, 4) aspen/limber pine woodland, 5) limber pine savannah, 6) low sage/cushion plant, 7) big sagebrush steppe (minor community), and 8) rock outcrop/thin grassland. Conducted rare plant surveys within project area. Also conducted vegetation surveys within reclaimed coal mining operations.

Tronox, LLC, Comprehensive Environmental Response, Compensation and Liability Act Removal Action-Riley Pass Uranium Mine Reclamation, South Dakota. Task manager for the development and implementation of a pilot-scale revegetation test on unvegetated mining spoils. The Riley Pass site, located on U.S. Forest Service land, consists of large areas (300+ acres) of spoil materials that have remained unvegetated since surface mining for uranium ceased in the 1960s. Conditions adverse to revegetation include areas of sodic and sodic-saline materials, areas with significant concentrations of phytotoxic metals, and areas of low pH. Designed and implemented a sampling program to identify test plot areas representative of the key soil conditions. Based on the findings from this study, defined a set of test plots, and developed a set of soil amendment variables to be tested. Working with the Forest Service, developed an appropriate seed mixture.

Pete Lien, Jonathon Project Limestone Quarry, Wyoming. Conducted baseline vegetation studies within and adjacent to the potential disturbance footprint that included seven vegetation communities: 1) short-grass prairie, 2) mountain mahogany shrubland, 3) limber pine woodland, 4) aspen/limber pine woodland, 5) limber pine savannah, 6) low sage/cushion plant, 7) big sagebrush steppe (minor community), and 8) rock outcrop/thin grassland. Conducted rare plant surveys within project area species include: Slender-leaved buckwheat (*Eriogonum exilifolium*), Colorado tansy-aster (*Machaeranthera coloradoensis*), and Laramie false sagebrush (*Sphaeromeria simplex*).

Special Studies

Colorado State University Forestry Department, Fire Regimes and Stand Dynamics of Whitebark Pine (*Pinus albicaulis*) Communities in the Greater Yellowstone Ecosystem. Ecologist. Assisted in collecting and analyzing data for this study, which examined the structure and age composition of whitebark pine communities. The study assessed the historic fire regimes and fuel conditions within different whitebark pine communities in the Greater Yellowstone Ecosystems. Assisted with tree coring and vegetation sampling.

Colorado State University Natural Resource Ecology Laboratory, Vegetation Assessments of the Grand Staircase-Escalante National Monument, Utah. Ecologist. Conducted vegetation sampling and mapping using the Modified-Whitaker sampling method throughout the Staircase. Main duties were identifying and quantifying plant cover within each plot.

Colorado State University Natural Resource Ecology Laboratory, Vegetation Response to Fire and Post-Burn Seeding Treatments in Juniper Woodlands of the Grand Staircase-Escalante National Monument, Utah. Ecologist. Assisted with collecting vegetation data of native and non-native species within the juniper woodlands of southern Utah. This study compared seeding strategies within burned areas of the Pinyon/Juniper community. Seed mixture comparisons were analyzed

between native, non-native, and non-native/native mixtures.

Colorado State University Restoration Ecology Laboratory, Post-Disturbance Vegetative Assessment and Analysis, Colorado, New Mexico, Washington, and Wyoming. Research associate. Assisted with research projects where the primary objective was to evaluate site characteristics followed by greenhouse and field studies to identify appropriate plant species and soil treatment combinations that would produce a productive and self-sustaining plant community.

These studies occurred in four unique ecosystems, including: the Sub-Alpine Fir/Engelmann Spruce community on the Summitville Superfund Site in Colorado; the Pinyon/Juniper and Sagebrush communities within the Piceance Basin in Colorado; the Ponderosa Pine community in Bandelier National Monument, New Mexico; and the Sagebrush community in the Yakima Training Center, Washington. These studies resulted in the formulation of a plan for site-wide restoration.

In addition, conducted vegetation sampling for testing alternative control strategies for non-indigenous knapweeds and annual brome grasses on U.S. military installations. The main objective was to develop a general strategy for the control of these weeds in the western U.S. Evaluated the control of non-indigenous invasive plant species with a combination of four treatments that accelerate secondary succession. These treatments were initiated on disturbed sites with weed infestations at Fort Carson, Colorado, and Yakima Training Center, Washington, from 2000-2003.

Other Projects

The Murulle Foundation (1999-2011). Director and founding member of a non-profit 501 (C)(3) organization concerned with conserving the balance between cultural and natural resources in sub-Saharan Africa. Primary activities include research of afro-Montane ecosystems in the highlands of Ethiopia, with particular emphasis on tropical forest ecology as it relates to endangered wildlife, including researching the population distribution, sex-age ratio, feeding ecology, and habitat preference of the Mountain Nyala (spiral-horned antelope endemic to the Afro-montane forest of Ethiopia). Other studies include botanical forest inventories and forest vegetation mapping of the Bale Mountains.

Publications

A Profile of the Mountain Nyala (*Tragelaphus buxtoni*). 2007. African Endaba.

Modeling Habitat Quality of the Mountain Nyala (*Tragelaphus buxtoni*). 2010. In Review: Journal of Wildlife Management.

Range and Habitat of the Mountain Nyala (*Tragelaphus buxtonii*). 2008. Report to the World Conservation Union IUCN Antelope Specialist Group.

Range and Distribution of the Mountain Nyala (*Tragelaphus buxtonii*). 2006. Report to the Ethiopian Wildlife Department.

MATT VESH, B.S., BOTANIST, WETLANDS SPECIALIST

Matthew Vesh is a wetland scientist and botanist with 10 years of experience conducting botanical surveys and wetlands-related work throughout the western U.S. and Great Lakes region. His range of expertise includes delineation and restoration of wetlands and shoreline habitat; invasive, rare, threatened and endangered plant surveys; development and implementation of vegetation management plans; management of field crews; and technical report writing.

Mr. Vesh has experience performing wetland determinations in the Pacific Northwest, including projects associated with road improvements and energy infrastructure. He has conducted rare, threatened, and endangered plant species surveys and botanical site inventories for public lands in Wyoming, northern California and northeastern Utah.

YEARS OF EXPERIENCE

10

EXPERTISE

Wetland and stream delineation

Vegetation mapping and surveying

Habitat restoration and construction

Botany

Rare, threatened, and endangered species surveys

Invasive plant management

EDUCATION

B.S., Environmental Management;
Indiana University; Bloomington,
Indiana; 2004

TRAINING

Indiana Department of Natural
Resources Prescribed Fire for
Managers Training; 2008

National Wildfire Coordination Group
Leadership Training; 2008

32-hour Institute of Botanical Training
Wetland Flora Workshop; 2006

38-hour Army Corps of Engineers
Wetland Delineation and Management
Training Program; 2004

SELECTED PROJECT EXPERIENCE

Cedar Creek Anticline Pipeline and Enhanced Oil Recovery Development Project; Multiple Counties, Wyoming; Denbury Onshore, LLC. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the Cedar Creek Anticline as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit). Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single National Environmental Policy Act (NEPA) document. *Role: Biologist. Lead biologist for greater sage-grouse habitat sampling. Primary tasks included species level identification of vegetation and quantitative assessment of plant species size and densities. Additional tasks included invasive plant species surveys, prairie dog colony surveys, greater sage-grouse presence/absence surveys, daily planning of survey logistics, and preparation of daily progress reports.*

Action Effectiveness Restoration Habitat Monitoring; Portland, Multnomah County, Oregon; Lower Columbia Estuary Partnership. SWCA collected vegetation monitoring data as part of the Lower Columbia Estuary Partnership's program, using *Protocols for Monitoring Habitat Restoration Projects in the Lower Columbia River and Estuary* (Roegner et al. 2009). *Role: Environmental Specialist / Lead Botanist. Conducted botanical surveys and provided quality assurance and control for plant species identification.*

Antelope Ridge Wind Project; Union County, Oregon; EDP Renewables North America, LLC. This 130-turbine, 300-megawatt wind farm project was located on approximately 40,000 acres of leased land. Within the study area boundary, 169 wetland areas totaling 111 acres and 87 stream segments were delineated. *Role: Environmental Specialist. Provided wetland delineation services to meet the permitting requirements to obtain a Site Certificate from the Oregon Energy Facility Siting Council and to receive state and U.S. Army Corps of Engineers wetland permits.*

Bog Creek Road Environmental Impact Statement; Boundary County, Idaho; U.S. Customs and Border Protection. SWCA is currently assisting the Spokane Sector of the U.S. Customs and Border Protection with NEPA compliance for the Bog Creek Road rehabilitation project on lands managed by the U.S. Forest Service in the Idaho Panhandle National Forests. SWCA advised and assisted the U.S. Customs and Border Protection

through the scoping process, prepared all scoping materials, facilitated the scoping meetings, and prepared the scoping summary report. SWCA collected field data, prepared reports for cultural, terrestrial, and aquatic resources, and assisted with Section 7 Endangered Species Act analysis and reporting. *Role: Environmental Specialist. Conducted wetland delineation fieldwork; threatened, endangered, and sensitive plant and animal species survey fieldwork; invasive plant species survey fieldwork; and prepared reports.*

27937 NE 122nd Avenue Oak Management Plan; Clark County, Washington; Partner Engineering and Science, Inc. SWCA prepared a habitat management plan in support of the development of a new cellular communications tower and support facilities for a site in unincorporated Clark County. The plan was triggered by the presence of Oregon White Oak stands on the parcel, which is regulated under County Code as a Fish and Wildlife Conservation Area. SWCA conducted a site assessment to determine the limits of the regulated habitat, prepared an impact assessment in conjunction with the engineer's site plan, and developed a mitigation and monitoring plan as required by County Code. *Role: Environmental Specialist. Conducted habitat delineation fieldwork and prepared a mitigation plan.*

Gunderson; Multnomah County, Oregon; Gunderson, Inc. SWCA is currently updating a biological assessment prepared in 2008 to address potential impacts to Endangered Species Act-listed species from infrastructure repair work. The biological assessment document describes existing habitat conditions and land use in the project area, potential impacts to natural resources, and beneficial aspects of the project. *Role: Environmental Specialist. Conducted vegetation survey fieldwork and prepared memorandum.*

Intertie Wetland Mitigation Monitoring; Clackamas County, Oregon; Clackamas County Water Environment Services. SWCA is currently performing 5 years of annual vegetation monitoring and reporting for this Clackamas County wetland mitigation project. Habitats at the site include seasonally-inundated emergent wetlands and upland prairie habitat. *Role: Environmental Specialist. Conducted wetland mitigation monitoring fieldwork and prepared report.*

Lookout Pass Environmental Impact Statement; Shoshone County, Idaho; Confidential. SWCA is preparing an Environmental Impact Statement for a proposed ski area expansion within National Forest lands along the Idaho and Montana border. To date, SWCA has developed the proposed action and purpose and need, as well as completed public scoping and defined the project scope. SWCA is currently preparing the preliminary draft Environmental Impact Statement under the direction of the U.S. Forest Service. *Role: Environmental Specialist. Conducted rare and invasive plant surveys, wetland determinations, and a general wildlife survey of the area. Assisted in NEPA report writing.*

Lower Snake River Wind Energy Project Cultural and Natural Resources; Columbia County, Washington; RES America Developments, Inc. SWCA completed a cultural resource inventory, conducted a wetlands and waters delineation and rare plant survey, and authored an environmental impact statement for water resources for a proposed commercial wind energy generation facility with approximately 795 turbines and 1,432 megawatts of electricity capacity. The project covered approximately 124,000 acres of private land. SWCA also assisted the client and the counties with the tribal consultation, including the Confederated Tribes of the Umatilla and the Nez Perce Tribe. *Role: Wetland Specialist. Conducted wetland delineation fieldwork and botanical surveys for rare, threatened, and endangered species; assisted with reporting.*

Mitigation Site Management 2014; Multnomah County, Oregon; Port of Portland. For over 15 years, SWCA has been conducting annual vegetation mitigation monitoring and reporting, monitoring of avifauna, amphibian and invasive plant species; coordinating invasive species control; and conducting site maintenance at 15 mitigation sites. *Role: Environmental Specialist. Conducted field surveys of wetland mitigation properties to identify and locate the presence of noxious plant species, made recommendations for mitigation site management, assisted with management and implementation of planting projects, and prepared memoranda.*

Trillium Creek Wetland Mitigation Monitoring; West Linn, Clackamas County, Oregon; West Linn - Wilsonville School District. SWCA is currently providing annual wetland mitigation monitoring services and restoration management for wetland impacts associated with the construction of Erickson Primary School. SWCA also conducted a wetland delineation "light" and a functions and values assessment using the Oregon Rapid Wetland Assessment Protocol. Extensive Agency coordination was needed for the approval of permit modifications to the original mitigation plan. *Role: Environmental Specialist. Conducted wetland mitigation monitoring fieldwork and prepared report.*

PDX Runday 3/21 Wetland Hydrology Monitoring Plan and Installation; Portland, Multnomah County, Oregon; Port of Portland. SWCA is currently assisting the Port of Portland in determining the correlation between inundations of filled wetlands at the airport and an off-site Multnomah County Drainage District ditch. *Role: Environmental Specialist. Prepared a hydrology monitoring plan, installed shallow groundwater observation wells, and prepared technical memorandum.*

CODY VICENIK, B.S., ENVIRONMENTAL SPECIALIST

Mr. Vicenik is an environmental specialist with experience in biological resources consulting. He has developed an understanding of National Environmental Policy Act (NEPA), Clean Water Act (CWA), and Endangered Species Act (ESA) compliance.

Mr. Vicenik's experience conducting natural resource studies includes wetland delineations, wetland qualitative assessments, ordinary high water mark delineations, threatened and endangered species assessments, wildlife studies, vegetation studies, and ecological monitoring. He has worked throughout Arkansas, Louisiana, Oklahoma, and Texas and parts of Alabama, Colorado, Mississippi, Montana, New Mexico, and Wyoming. Mr. Vicenik's technical writing skills include the preparation of various environmental compliance and permitting documents.

YEARS OF EXPERIENCE

3

EXPERTISE

Wetland Delineations

T&E Species Assessments

EDUCATION

B.S., Biology m: Economics; Texas State University; San Marcos, Texas; 2012

TRAINING

Wetland Delineation Certification, Wetland Training Institute; Houston, Texas, 2013

Basic Plus, 11/2015

Certified First Aid/CPR/AED

SCUBA Diving License, NAUI; 2011

SELECTED PROJECT EXPERIENCE

Cedar Creek Anticline Pipeline and Enhanced Oil Recovery Development Project; Multiple Counties, Wyoming; Denbury Onshore, LLC. SWCA is supporting Denbury in conducting, overseeing, and tracking the permitting for the Cedar Creek Anticline (CCA) Pipeline and Enhanced Oil Recovery (EOR) Development Project. The project involves a 111-mile, 20-inch pipeline for transporting CO₂ from Bell Creek to the proposed EOR field development in the CCA as well as planning and designing three EOR fields in Montana, totaling 44,490 acres (the Pennel Unit, the East Lookout Butte Unit, and the Coral Creek Unit). Permitting includes applying for a generic Application for Permit to Drill that coincides with the pipeline right-of-way application for each separate identified field. The pipeline and the fields will be analyzed under a single NEPA document. *Role: Environmental Specialist. Contributed to the wetland determination and greater sage-grouse habitat assessment.*

Chokecherry and Sierra Madre Natural Resource; Carbon County, Wyoming; Power Company of Wyoming, LLC. As the environmental program manager for the Power Company of Wyoming's Chokecherry and Sierra Madre Wind Energy project near Rawlins, Wyoming, SWCA oversees and coordinates activities related to ongoing natural resource, cultural resource, planning, conservation and compliance activities. Specific projects completed as part of the support services provided to Power Company of Wyoming include: avian monitoring, greater sage-grouse monitoring and research, permitting support, cultural resources support, and watershed/water resource monitoring. *Role: Environmental Specialist. Lead in the wetland determination, ecological site descriptions for sagebrush steppe vegetation transects and Natural Resources Conservation Service soil surveys, and sage grouse capture and tagging.*

Midland to Sealy Pipeline Project; Multiple Counties, Texas; Enterprise Crude Pipeline LLC. SWCA provided full environmental survey and permitting services on a proposed 400-mile long crude oil pipeline. SWCA began by completing a constraints analysis of the proposed route, followed by natural and cultural resource surveys, and ending with U.S. Army Corps of Engineers permitting and obtaining other agency authorizations, as necessary. *Role: Environmental Specialist. Lead in the wetland determination, threatened and endangered species survey including aerial bird surveys, and habitat surveys.*

Plains 300-mile McCamey to Gardendale Pipeline; Multiple Counties, Texas; Plains All American Pipeline, LP. SWCA assisted with permitting for a proposed 300-mile pipeline and also conducted a cultural resource survey. *Role: Environmental Specialist. Contributed to the wetland determination, threatened and endangered species survey, and habitat survey.*