PROGRAMMATIC BIOLOGICAL ASSESSMENT AND BIOLOGICAL EVALUATION

REVISED ADDENDUM

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On behalf of:
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Revised Addendum to:
Programmatic Biological Assessment and Biological Evaluation for
Fort Berthold Indian Reservation Oil and Gas Development, May 2014 and August 2015

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1.0 INTRODUCTION AND BACKGROUND

The Endangered Species Act (ESA) was passed by Congress in 1973. The purpose of the ESA is to protect and recover imperiled species and the ecosystems upon which they depend. Section 2 of the ESA mandates that all federal departments and agencies seek to conserve endangered and threatened species and utilize their authorities in furtherance of the purposes of the ESA. Section 7 of the ESA directs all federal agencies to utilize their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of endangered and threatened species. Section 7 also directs departments and agencies to ensure that their actions are not likely to jeopardize the continued existence of any threatened or endangered species or result in destruction or adverse modification of these species' critical habitats. It also requires all federal departments and agencies to consult with the Secretary of Interior or Secretary of Commerce (marine species only) whenever an authorized action is likely to affect a listed or proposed species and/or its critical habitat.

According to Section 7(c) of the ESA, the purpose of a biological assessment is to identify any endangered or listed species that are likely to be affected by the proposed action. This document serves as an addendum to the *Programmatic Biological Assessment Biological Evaluation (BABE) for Fort Berthold Indian Reservation Oil and Gas Development* (United States [U.S.] Bureau of Indian Affairs [BIA] 2014). The BABE was submitted by the BIA to the U.S. Fish and Wildlife Service (USFWS) in May 2014. The USFWS concluded informal consultation on June 4, 2014, with the BIA in regards to the Proposed Action. The USFWS concurred with the BIA's determinations for the listed species and designated critical habitat. If, based on the results of this addendum to the BABE, it is determined that the Proposed Action *may affect, is likely to adversely affect* any listed species, formal consultation would be initiated with the USFWS.

This addendum does not represent material changes to the project description for the Proposed Action, action area, or other conclusions for the BABE, but introduces new information indicating that the following species are federally listed species: threatened Dakota skipper (*Hesperia dacotae*), threatened rufa red knot (*Calidris canutus rufa*), endangered Poweshiek skipperling (*Oarisma poweshiek*), and threatened northern long-eared bat (*Myotis septentrionalis*). The Dakota skipper, the rufa red knot, and the northern long-eared bat were addressed in the BABE and were proposed threatened (e.g., Dakota skipper and rufa red knot) and proposed endangered (e.g., northern long-eared bat) species at the time. The Poweshiek skipperling was not addressed in the BABE but was recently federally listed.

This document will not repeat the original report, but will refer to the information available in the original BABE. This addendum to the BABE is prepared in accordance with the legal requirements set forth under Section 7 of the ESA (19 United States Code 1536 [c]).

2.0 PROJECT DESCRIPTION

The Proposed Action is potentially granting right-of-way/easement approvals and Application for Permit to Drill by Bureau of Land Management (BLM) with concurrence from BIA. The Proposed Action includes drilling of up to 1,740 wells from approximately 435 pads (an average of four wells per pad) for the exploration and production of oil and associated gas over the next five years on the Fort Berthold Indian Reservation (FBIR). These wells would be drilled after permission to drill has been received from the BLM and the North Dakota Industrial Commission (NDIC) by the mineral leaseholders that are parties to the Proposed Action. The Proposed Action includes associated well pad construction; drilling and completion of the wells; construction of access roads; installation of oil, gas, fresh water and produced water flow lines; installation of buried electric utility lines; and other oil and gas related facilities.

The BIA would track and conduct yearly reviews of all activities conducted under the BABE. The BIA would prepare a yearly summary report and conduct an annual meeting between November and February (for the duration of the validity of the BABE).

See the original BABE for more information (BIA 2014).

3.0 ACTION AREA

The action area, or Project Area, for the Proposed Action is the entire FBIR. The FBIR is the home of the Mandan, Hidatsa, and Arikara (MHA) Nation, which is comprised of the Mandan, Hidatsa, and Arikara tribes. The FBIR encompasses approximately 1 million acres, of which almost half is held in trust by the U.S. for either the MHA Nation or individual Native Americans (known as allottees). The FBIR is located in six counties in west-central North Dakota: Dunn, McKenzie, McLean, Mercer, Mountrail, and Ward. Elevation on the FBIR ranges from 1,840 to 2,600 feet.

One of most distinguishing characteristics of the FBIR is Lake Sakakawea. The lake was formed with the completion of the Garrison Dam in April of 1953. With a storage capacity of approximately 23.8 million acre-feet of water, Lake Sakakawea is the largest of the Missouri River mainstem reservoirs.

See the original BABE for more information, including a map of the proposed Project Area (BIA 2014).

4.0 THREATENED AND ENDANGERED SPECIES

4.1 DAKOTA SKIPPER

The Dakota skipper is a small butterfly with a 1-inch wingspan. Like other species of skippers, they have a thick body with a more powerful and faster flight than other butterflies. The upper side of a male's wing ranges from tawny orange to brown, while the upper side of a female's wing is darker brown with tawny-orange spots and faint white spots on the margin of the wing (USFWS 2011). Dakota skippers make one flight per year, usually occurring from the middle of June through the end of July. The flight period varies from year to year, depending on weather patterns (McCabe 1979 and 1981; Dana 1991; Royer and Marrone 1992a; Skadsen 1997; Swengel and Swengel 1999). The average adult lifespan of a Dakota skipper is three weeks (Dana 1991).

4.1.1 STATUS AND DISTRIBUTION

The Dakota skipper was listed as threatened under the ESA on November 24, 2014 (79 Federal Register [FR] 63672); designated critical habitat for the Dakota skipper will be effective November 2, 2015, under the ESA (80 FR 59248).

Dakota skippers were once found from southern Saskatchewan, across North and South Dakota, and into Minnesota, Iowa, and Illinois. Currently, the Dakota skipper occurs no further east than western Minnesota and is believed to be extirpated from Illinois and Iowa. In 2012, Dakota skippers were detected at 13 of the 25 sites surveyed in North Dakota. Approximately 135 additional locations were surveyed in North Dakota from 1991–2012 (USFWS 2013a, unpublished geodatabase), and the species was never detected. However, none of the locations surveyed were on the FBIR (H. Riddle, USFWS, personal communication [pers. comm.], January 2014; Royer 2012). Only a small fraction of the grassland in North Dakota has been surveyed for the Dakota skipper and it is thought, per 78 FR 63574 and USFWS 2013a, unpublished geodatabase, that a significant portion of the un-surveyed grassland is unsuitable for the Dakota skipper. Dakota skippers are documented as occurring at 18 separate sites within five counties in North Dakota (Royer and Royer 2012). Of those 18 sites, 13 are within the Towner-Karlsruhe complex (complex defined as a known or suspected metapopulation) (Cochrane and Delphey 2002) in McHenry County (northeast of the FBIR), one is located in the Sheyenne National Grasslands in Ransom County (southeast of the FBIR), and one is located in both Wells County and McLean County, which are both east of the FBIR. The two remaining sites are located in McKenzie County (Royer and Royer 2012); one is outside the Project Area and one is within the Project Area (further discussed in Section 4.1.4).

4.1.2 HABITAT

Habitat for Dakota skippers consists of high-quality prairie ranging from wet-mesic tallgrass prairie to dry-mesic mixed-grass prairie. Royer and Marrone (1992a) categorized Dakota skipper habitat into two main types that were once intermixed on a landscape scale but are now mostly segregated. The first, referred to as Type A, is low wet-mesic prairie that occurs on near-shore glacial lake deposits in north-central North Dakota, southeast North Dakota, and Manitoba. Type A Dakota skipper habitat is dominated by bluestem grasses (e.g., *Andropogon* spp. and *Schizachyrium scoparium*), with three forb species almost always present and in flower during Dakota skipper's flight period: Wood lily (*Lilium philadelphicum*), bluebell bellflower (*Campanula rotundifolia*), and mountain deathcamas (smooth camas; *Zigadenus elegans*) (McCabe 1981). This habitat type has a high water table and is subject to intermittent flooding in the spring.

The second Dakota skipper habitat type, referred to as Type B, occurs on rolling terrain over gravelly glacial moraine deposits and is dominated by bluestem grasses and needle grasses (*Heterostipa* spp.). Bluebell bellflower and wood lily are also present in Type B habitat, but Type B habitats also support more extensive stands of upright coneflowers (*Elaeagnus angustifolia*) and common gaillardia (*Gaillardia aristata*) (Royer and Marrone 1992a). Both Type A and Type B prairies may contain slightly depressional wetlands (low topographical areas that allow for the collection of surface water) with extensive flat areas and slightly convex hummocks (Lenz 1999). The forb species provide the Dakota skipper with nectar that is critical for survival during the relatively short (three week) flight period in June and July (USFWS 2011). Requisite plant species for Type B habitat in North Dakota are included in Table 1 below.

Prairie habitat that could potentially support Dakota skipper populations is characterized by both the presence and abundance of plant species that are required for Dakota skippers' life history. Mid- to tall-grasses are required for the larval stage whereas nectar-producing forbs are crucial for the adult stage (Dana 1997; Shepherd and Debinski 2005). The Dakota skipper is considered to be a habitat specialist, as it relies on specific native prairie plant species for either its larval food or adult nectar resources. Habitat-specialist species, including the Dakota skipper, are typically found in high quality prairie habitat (Vogel et al. 2010) that contains limited invasive plant and/or woody species.

In the Towner-Karlsruhe complex in McHenry County, Lenz (1999) noted that Dakota skippers appear to be more commonly associated with mesic to wet-mesic prairie (Type A) than in other parts of their range to the south and east (northeast of the FBIR). Type B habitats are more commonly found in western sites (H. Riddle, USFWS, pers. comm., January 2014; Royer 2012), particularly on FBIR.

TABLE 1. REQUISITE PLANT SPECIES FOR TYPE B HABITAT

Key Plant Species	Common Name	Forb or Grass
Amorpha canescens	Leadplant	Forb
Andropogon gerardii	Big bluestem	Grass
Artemisia frigida	Prairie sagewort	Forb
Astragalus crassicarpus	Groundplum milkvetch	Forb
Bouteloua curtipendula	Sideoats grama	Grass
Calylophus serrulatus	Yellow sundrops	Forb
Campanula rotundifolia	Bluebell bellflower	Forb
Dalea candida	White prairie clover	Forb
Dalea purpurea	Purple prairie clover	Forb
*Echinacea angustifolia**	Purple coneflower	Forb
*Gaillardia aristata**	Common gaillardia/blanketflower	Forb
Geum triflorum	Old man's whiskers/prairie smoke	Forb
*Hesperostipa comata**	Needle-and-thread grass	Grass
*Hesperostipa spartea**	Porcupine grasses	Grass
Liatris aspera	Tall blazing star	Forb
Liatris punctata	Dotted blazing star	Forb
*Lilium philadelphicum**	Prairie Lily/Wood Lily	Forb
Packera plattensis	Prairie groundsel	Forb
*Pascopyrum smithii**	Western wheatgrass	Grass
Pulsatilla patens	Eastern pasqueflower	Forb
*Ratibida columnifera**	Upright prairie coneflower	Forb
*Rudbeckia hirta**	Black-eyed susan	Forb
*Schizachyrium scoparium**	Little bluestem	Grass
*Sorghastrum nutans**	Indiangrass	Grass
Sporobolus heterolepis	Prairie dropseed	Grass
Symphyotrichum sericeum	Western silver aster	Forb
Zizia aptera	Meadow zizia/heartleaf golden alexanders	Forb

Source: USFWS 2015b; Royer et al. 2014
* Requisite habitat species identified in Royer et al. (2014)

Generally, the Dakota skipper is found in prairie areas with steeper slopes, which may be due, in part, to the tendency for grazing pressure to be lighter along sloped areas. Steep slopes may play a role in reducing the adverse effects of grazing at some sites. For example, at one grazed site inhabited by the Dakota skipper in South Dakota, habitat on steep slopes was ''in good condition,'' whereas ''lesser slopes'' were ''moderately grazed'' and some areas were ''overgrazed'' (Skadsen 1999). In Dana (1997), two of three sites identified as having the highest probability for supporting viable populations of the species in Minnesota consisted of typically short and steep slopes (25 to 40 percent). In addition, Royer et al. (2014) suggests that there is potential for the species to occur on north and east-facing slopes within the watershed that encompasses the Project Area.

Dakota skipper observations also appear to be correlated with areas that are characterized by loamy and sandy soils. Royer et al. (2008) characterized the abiotic environmental characteristics of prairies where the species has been identified; including analyzing nine occupied Dakota skipper sites in three states (i.e., North Dakota, South Dakota, and Minnesota). The general soil texture at all of the sites was sandy loams, and occasionally loamy sands (Royer et al. 2008). Sandy loams are soils that contain 7 to 20 percent clay, more than 52 percent sand, and the percentage of silt plus twice the percentage of clay is 30 or more. Loamy sand is soil that contains between 70 and 91 percent sand and the percentage of silt plus 1.5 times the percentage of clay is 15 or more (National Resource Conservation Service [NRCS] 2015)

In general, larger prairie patches (Swengel and Swengel 1999) tend to support a greater number and/or denser populations of Dakota skippers. Swengel and Swengel (1999) and the Dakota skipper Guidelines (Cochrane and Delphey 2002) both indicate that the highest densities of Dakota skippers are found on patches greater than 346 acres in Minnesota. Dakota skipper dispersal is very limited, in part due to a short adult life span and single annual flight. Unless a site is within about 0.6 mile of another site that generates a sufficient number of emigrants, the species' extirpation from the site is likely permanent. The species could be artificially reintroduced to a site; however, the capability to propagate the Dakota skipper is currently lacking (78 FR 63574). Further, Royer et al. (2014) and Royer and Royer (2012) noted that Dakota skipper habitat less than 10 acres is vulnerable to changes.

The species also prefers undisturbed prairie habitats to reclaimed areas. Findings by Shepherd and Debinski (2005) show that butterfly species diversity is generally lower on restored areas than in undisturbed habitats, though USFWS (2010) noted that degraded Dakota skipper habitats may be recoverable, especially if the habitat disturbance has not been especially intense or recent. For example, if the disturbance of the soil or native plants is not intense or prolonged, restoration of the habitat is feasible (H. Riddle, USFWS, pers. comm., January 2014; Royer 2012).

In addition, the Dakota skipper is sensitive to the presence of invasive plant species in their habitat, likely because invasive species displace the native species that it uses during its life cycle. The Dakota skipper is believed to be extirpated from 13 sites in four counties in North Dakota due to heavy grazing, weed control, and other disturbances (Royer 1997). Invasion of leafy spurge (*Euphorbia esula*) has significantly modified Dakota skipper habitat at the Sheyenne National Grasslands complex, and as a result, the species is believed to be extirpated from the site (Royer 1997). Section 5.1.2 provides conservation measures that would reduce any potential effects to Dakota skipper habitat.

4.1.3 THREATS

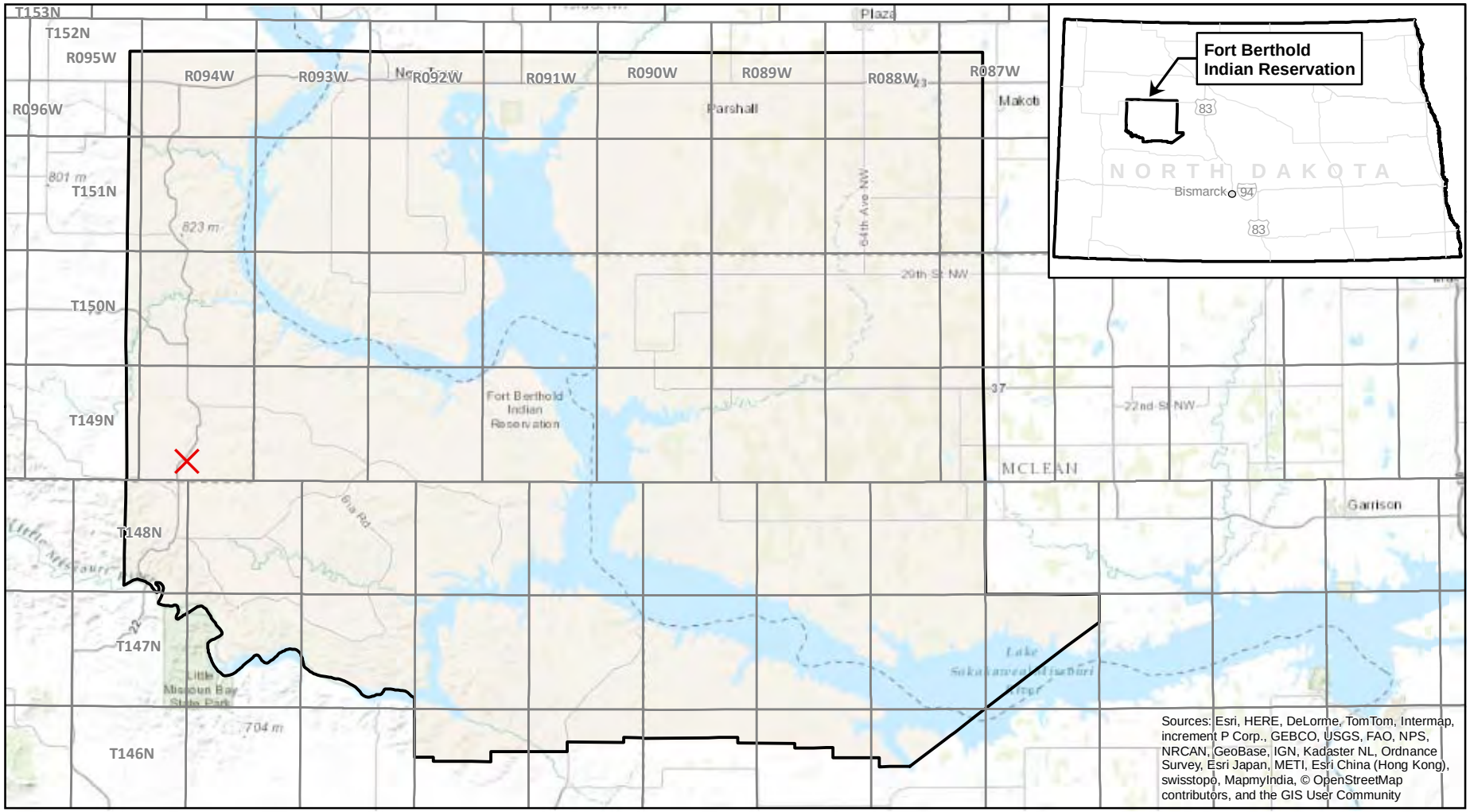
Primary causes for the decline in Dakota skipper populations and individual numbers include the loss of high-quality native prairie habitats from over grazing, conversion to agricultural land, disruption of natural prairie fire cycles from excessive fire suppression, and other disruptive activities (e.g., road construction and gravel mining) (USFWS 2011).

4.1.4 PRESENCE IN THE PROJECT AREA

Potential habitat and a previously documented population of Dakota skippers exist within the FBIR in McKenzie County. The Eagle Nest Butte population of Dakota skippers is located along the western edge of the FBIR (Figure 1). This population is located along the western edge of the Dakota skippers' range. The habitat size and location of this population is considered to be too small (approximately 10 acres) and isolated to be secure (Towner 2011). In 2012, the location was surveyed when the Dakota skipper was in peak flight elsewhere in the state; however, there were no observations of the species. The site was surveyed again in 2014, and two males were observed. Royer et al. (2014) noted that the site remained essentially unchanged since earlier surveys in 1991, 1996, and 1997; the area is still used for light occasional grazing. The prognosis for this population is uncertain due to the small size of the area. The nearest extant population to the FBIR population is located approximately 30 miles north/northwest in McKenzie County in the Little Missouri National Grassland (Royer et al. 2014), which is too far away to be a source of emigrants.

Outside of the Eagle Nest Butte population location, other potential habitat for the Dakota skipper does exist on the FBIR (Towner 2011) and there has been only one other confirmed occurrence. On July 7, 2015, a Dakota skipper was observed (pending confirmation) during a survey conducted for the presence of the species at a proposed well pad location on FBIR. The Dakota skipper was observed approximately 8 miles from the Eagle Nest Butte site (M. Cook, WPX Energy, pers. comm. July 2015). However, no additional confirmed Dakota skipper occurrences have been documented within the FBIR (North Dakota Parks and Recreation 2013; Cochrane and Delphey 2002; H. Riddle, USFWS, pers. comm., January 2014; Royer 2012). There was one unconfirmed observation of two adult Dakota skippers identified by Natural Resource Options, Inc., on August 19, 2010, on the FBIR in Dunn County (no photos or global positioning system [GPS] coordinates) (K. Williams, Atkins, Inc., pers. comm., January 2014); however, that occurrence has not been confirmed with any follow-up surveys or documentation by a specialist. Note, Dakota skipper occupancy surveys have typically been completed during mid-June through mid-July (Royer et al. 2014), approximately one month prior to when the unconfirmed observation in 2010 was documented.

In addition, there are two North Dakota units of critical habitat proposed for the Dakota skipper in McKenzie County; however, neither of the units is located within the FBIR (80 FR 59248).



EXPLANATION

DAKOTA SKIPPER EAGLE NEST BUTTE SITE

N

0 8 Miles

Trihydro CORPORATION
1252 Commerce Drive
Laramie, WY 82070
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(P) 307/745.7474 (F) 307/745.7729

FIGURE 1

DAKOTA SKIPPER EAGLE NEST BUTTE SITE

FORT BERTHOLD INDIAN RESERVATION PROGRAMMATIC BABE ADDENDUM

Drawn By: BR	Checked By: JM	Scale: 1" = 8 Miles	Date: 10/8/15	File: Fig1_DS_CriticalHabitat.mxd

4.2 POWESHIEK SKIPPERLING

The Poweshiek skipperling is a small and slender-bodied butterfly with a 1-inch wingspan. The size of the skipperling appears to vary somewhat across its range; the North Dakota and South Dakota populations tend to be slightly smaller than the Iowa populations (Royer and Marrone 1992b). The upper wing surface is dark brown with a band of orange along the wing margins and a lighter orange head. The underside of the wings are dark brown to light brown with very prominent white veins. Poweshiek skipperlings make one flight per year, usually occurring from the middle of June through the middle of July (USFWS 2014c).

4.2.1 STATUS AND DISTRIBUTION

The Poweshiek skipperling was listed as endangered under the ESA on November 24, 2014 (79 FR 63672); designated critical habitat for the Poweshiek skipperling will be effective November 2, 2015, under the ESA (80 FR 59248).

Historically, Poweshiek skipperlings were found in tallgrass prairie and prairie fens from Manitoba to Iowa, with populations also found in Michigan and Wisconsin (USFWS 2014c). Currently, the Poweshiek skipperling occurs in Wisconsin, Michigan, and Manitoba, and may have been extirpated from North and South Dakota, Minnesota, and Iowa in the last 10 years (USFWS 2014c). Surveys in North Dakota were minimal between 1998 through 2011, but surveys conducted in 1997 documented more than 10 Poweshiek skipperlings at one survey site. Surveys conducted during the 2012 and 2013 flight seasons in North Dakota resulted in zero detections; the species was last observed in North Dakota in 2001 (79 FR 63672). The species was not observed in any of the counties within the FBIR during the North Dakota surveys.

4.2.2 HABITAT

Habitat for Poweshiek skipperlings consists of prairie fens, tallgrass prairie, grassy lake and stream edges, moist meadows, sedge meadows, and wet-to-dry prairie. Royer and Marrone (1992b) describe the species' habitat in North Dakota and South Dakota as moist ground in undisturbed native tall grass prairies. Approximately 25,888 acres are being proposed for designation as critical habitat for the Poweshiek skipperling in Iowa, Michigan, Minnesota, North Dakota, South Dakota, and Wisconsin (80 FR 59248).

4.2.3 THREATS

The primary cause for the decline of the Poweshiek skipperling is habitat loss and degradation of native prairies from conversion to agriculture or other development; past and present fire, haying, or grazing management; flooding; and groundwater depletion, alteration, and contamination (79 FR 63672).

4.2.4 PRESENCE IN THE PROJECT AREA

The Poweshiek skipperling has not been observed on the FBIR. The skipperling is known or believed to occur in Cass, Ransom, Richland, and Sargent counties (USFWS 2014d), but the last observation of a live Poweshiek skipperling in North Dakota was in 2001 in Ransom County (over 200 miles southeast of the FBIR). The species was not detected in that county again during subsequent surveys in 2002, 2003, and 2012 (Spomer 2001, 2002, 2004; Selby 2010; Royer and Royer 2012).

4.3 RUFA RED KNOT

The rufa red knot is a medium sized shorebird about 9 to 11 inches in height. This species is easily recognized during breeding season because of the red plumage found on its face and prominent strip above the eye. The feathers on the lower belly and under the tail are whitish with dark flecks. Female red knots have similar coloring to males, but it is less intense. Nonbreeding plumage is dusky gray and white. The weight of the red knot varies by season with a minimum in the winter of approximately 4.4 ounces, and a maximum in the summer of 7.2 ounces (USFWS 2013b). They can live up to 2 years, but very few live more than 7 years (Niles et al. 2009).

4.3.1 STATUS AND DISTRIBUTION

The rufa red knot was listed as threatened under the ESA on January 12, 2015 (79 FR 73706). The current geographic distribution of the red knot has not changed from its historical distribution. The red knot migrates annually between its breeding grounds in the Canadian Arctic and several wintering regions, including the Southeast U.S., the Northwest Gulf of Mexico (including Texas), northern Brazil, and Tierra del Fuego at the southern tip of South America. Red knots are generally thought to return to the same wintering region each year (USFWS 2013b).

4.3.2 HABITAT

The rufa red knot generally prefers sandy, gravel, or cobble beaches, tidal mudflats, salt marshes, shallow coastal impoundments, lakes, and lagoons for its migration and wintering habitat. The red knot's diet during migration is similar to what it eats while wintering; hard-shelled mollusks supplemented by softer invertebrate prey such as shrimp, crab, marine worms, and horseshoe crab eggs (USFWS 2013b). During the breeding season, red knots generally nest in dry, slightly elevated tundra locations on windswept slopes with little vegetation in the Canadian Arctic. Female red knots typically lay one clutch of four eggs per season. Their diet in the arctic consists of terrestrial invertebrates, grass shoots, seeds, and other vegetable matter (Harrington 2001).

4.3.3 THREATS

In some areas, the rufa red knot population has declined 75 percent since the 1980s, with the steepest declines occurring after 2000. A primary factor in the recent decline of the species was reduced food supplies in Delaware Bay due to commercial harvest of horseshoe crabs (USFWS 2013c).

4.3.4 PRESENCE IN THE PROJECT AREA

Rufa red knots occur primarily along the ocean coasts during migration; however, a small number have been reported across the interior of the U.S. during migration. These sightings are concentrated along the Great Lakes, yet multiple reports have been made from nearly every interior state (eBird.org 2012). In 1998, the closest reported sighting from the Project Area of a rufa red knot was approximately 80 miles east of FBIR, in Wells County, North Dakota (eBird.org 2014). Information is lacking on the specific noncoastal stopover habitats used by red knots (USFWS 2013c).

To better characterize the rufa red knots migration path and associated stopover locations, a number of recent studies have used geolocators affixed to individual birds' legs. These small devices record periodic, time-stamped, ambient light levels to determine geographic locations. Ongoing studies by David Newstead and Larry Niles using geolocators showed that four birds departed from Texas in late May and stopped over in the Northern Great Plains before flying to the Arctic (Baker et al. 2013). Newstead et al. (2013) reported geolocator results from Texas-wintering red knots that used a spring stopover in southern Saskatchewan. One bird also used a stopover in north-west North Dakota (exact location not known, though it could have been near the Project Area). Following publication of the Newstead et al. (2013) study results, additional geolocator data became available showing six additional red knots stopping on the U.S. side of the Northern Plains; three in North Dakota, two in Montana, and one possibly in Nebraska (D. Newstead pers. comm., May 16, 2014).

Three full years of geolocator data are available for one Texas-wintering red knot and demonstrate the considerable variability observed between years in this species' migratory strategy. Although certain stopover sites were used in multiple years, the actual routes and number of stopovers varied considerably from year to year (D. Newstead pers. comm., May 8, 2014). In one year, a bird followed northbound and southbound tracks spaced relatively close to one another, both passing over Minnesota. In a second year, the northbound and southbound tracks were widely separated, passing over North Dakota in spring and over the Great Lakes in fall. In the third year, this bird again passed over North Dakota in spring, but followed the Atlantic and Gulf coasts in fall (D. Newstead pers. comm., May 8, 2014; USFWS 2014e).

4.4 NORTHERN LONG-EARED BAT

The northern long-eared bat is a medium-sized bat about 3 to 3.7 inches long with a wingspan of 9 to 10 inches. The northern long-eared bat can be distinguished from other bats by its long ears that average 0.7 inch in length (Whitaker and Mumford 2009). Its fur can be medium to dark brown on its back and tawny to pale on its underside. This species can live up to 18.5 years (USFWS 2015c).

4.4.1 STATUS AND DISTRIBUTION

The northern long-eared bat was listed as threatened under the ESA on May 4, 2015 (80 FR 17974). In addition, the USFWS issued an interim 4(d) rule in conjunction with the final rule to list the northern long-eared bat as threatened. The interim 4(d) rule provides flexibility to landowners, land managers, government agencies and others as they conduct activities in northern long-eared bat habitat. The USFWS also published a key to the northern long-eared bat interim 4(d) rule for non-federal projects. The key lists eight steps to follow for determining whether a take permit is needed for a specific action. Although this BABE is prepared for a federal action and the key is not required, the key was used to guide the analysis and identify potential impacts for the species (Section 5.4).

The current geographical distribution of the northern long-eared bat has not changed from its historical distribution. The northern long-eared bat can be found in the eastern and north-central U.S., including the entire state of North Dakota, and all Canadian provinces from the Atlantic Ocean west to southern Yukon Territory and eastern British Columbia. However, the species is historically less common in the western portion of its range, which includes North Dakota, than in the northern portion of the range (Amelon and Burhans 2006). In addition, the State of North Dakota is not located within the white-nose syndrome buffer zone as delineated by the USFWS (2015e). Summer surveys in North Dakota (2009-2011) documented the species in the Turtle Mountains, the Missouri River Valley, and in the Badlands (Gillam and Barnhart 2011). No northern long-eared bat hibernacula are known to occur within North Dakota; however, there has been very limited survey effort in the state (H. Riddle, USFWS, pers. comm., February 2012).

4.4.2 HABITAT

This species spends winter hibernating in caves or mines with constant temperatures and high humidity, and summer roosting singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. Only rarely has the species been found roosting in manmade structures (e.g., barns and sheds). Northern long-eared bats typically hibernate between mid-fall and mid-spring each year (USFWS 2014b). Pregnant females migrate to summer areas and roost in small colonies with other pregnant females where they give birth to one pup.

4.4.3 THREATS

The primary reason for the decline in the species is due to white-nose syndrome (a disease that affects hibernating bats). The species has declined 99 percent in the northeastern U.S. because of this disease. Impacts to hibernacula, loss or degradation of summer habitat, and wind farm operation may also be important factors affecting the species' ability to persist while suffering from white-nose syndrome (USFWS 2015c). Exposure to holding ponds containing flow-back and produced water from hydraulic fracturing operations may also expose bats to toxins and other contaminants (Hein 2012), though holding ponds would not be allowed on trust lands on the FBIR over which the BIA has jurisdiction.

4.4.4 PRESENCE IN THE PROJECT AREA

No known occurrences of the northern long-eared bat have occurred in the Project Area. The North Dakota Heritage Inventory does not have any record of the northern long-eared bat occurring in North Dakota (C. Dirk, North Dakota Natural Resource Division, pers. comm., February 2014). However, occurrences have been documented within the Turtle Mountains, the Missouri River Valley, and in the Badlands of North Dakota during recent summer surveys (Gillam and Barnhart 2011).

5.0 EFFECTS ANALYSIS

5.1 DAKOTA SKIPPER

5.1.1 STRESSOR AND RESPONSE

The primary threats and stressor categories from the Proposed Action are described below, and can be found in Appendix B of the BABE (BIA 2014). The greatest potential stressor to the Dakota skipper is the loss or degradation of its habitat (Cochrane and Delphey 2002). Dakota skipper habitat may be converted from native prairie to land used for various agricultural purposes, mining, and other development. Habitat degradation may occur from grazing, invasion of nonnative species, and pest control. Within the Project Area, most of the land located north and east of Lake Sakakawea has been converted to cropland and no longer provides quality habitat. Approximately 34 percent of the Project Area is classified as grassland ecosystems based on desktop data, and these grasslands are largely located in the southern and western portions (U.S. Geological Survey [USGS] 2010).

To examine the extent of potential effects to potential Dakota Skipper habitat, the BIA developed a desktop screening approach in combination with programmatic procedures to ensure that sites with a higher likelihood of Dakota skipper occupancy will be avoided, particularly in unbroken native prairie believed to contain the key plant species needed to support the species. As recommended by USFWS (2015a), this desktop screening approach will be used prior to siting, permitting, and construction activities under the Proposed Action. Using the best available scientific and publicly available data (at the time of writing this report), a series of coarse-to-fine scaled filters (or data layers) were used within a Geographical Information System (GIS) to identify and map potential Dakota skipper habitat quality within the FBIR landscape. Called the Dakota Skipper Habitat Suitability Model (HSM), this modeling approach produced a map that classified the entire FBIR landscape into polygons that indicate potential locations for possible habitat and possible high quality habitat, along with areas where habitat is not present or not likely to be present. A follow-up screening of the FBIR landscape was completed to characterize the area according to the presence or absence of prior disturbance. The purpose of this secondary screening was to rapidly identify areas that contain small patches of prairie in an otherwise developed landscape where the likelihood of the species being present is discountable (per USFWS recommendation [K. Shelley, USFWS, pers. comm., via email, September 2015]). Each proposed well pad location under the Proposed Action will be overlaid on each map (as applicable) to determine the next steps following the desktop review. Recognizing that this is a desktop screening tool, each habitat type will also be field-verified with different levels of survey requirements, depending upon habitat suitability as determined in the field. In areas where desktop and/or field verification suggest that possible high quality habitat is present, field survey requirements will be more comprehensive.

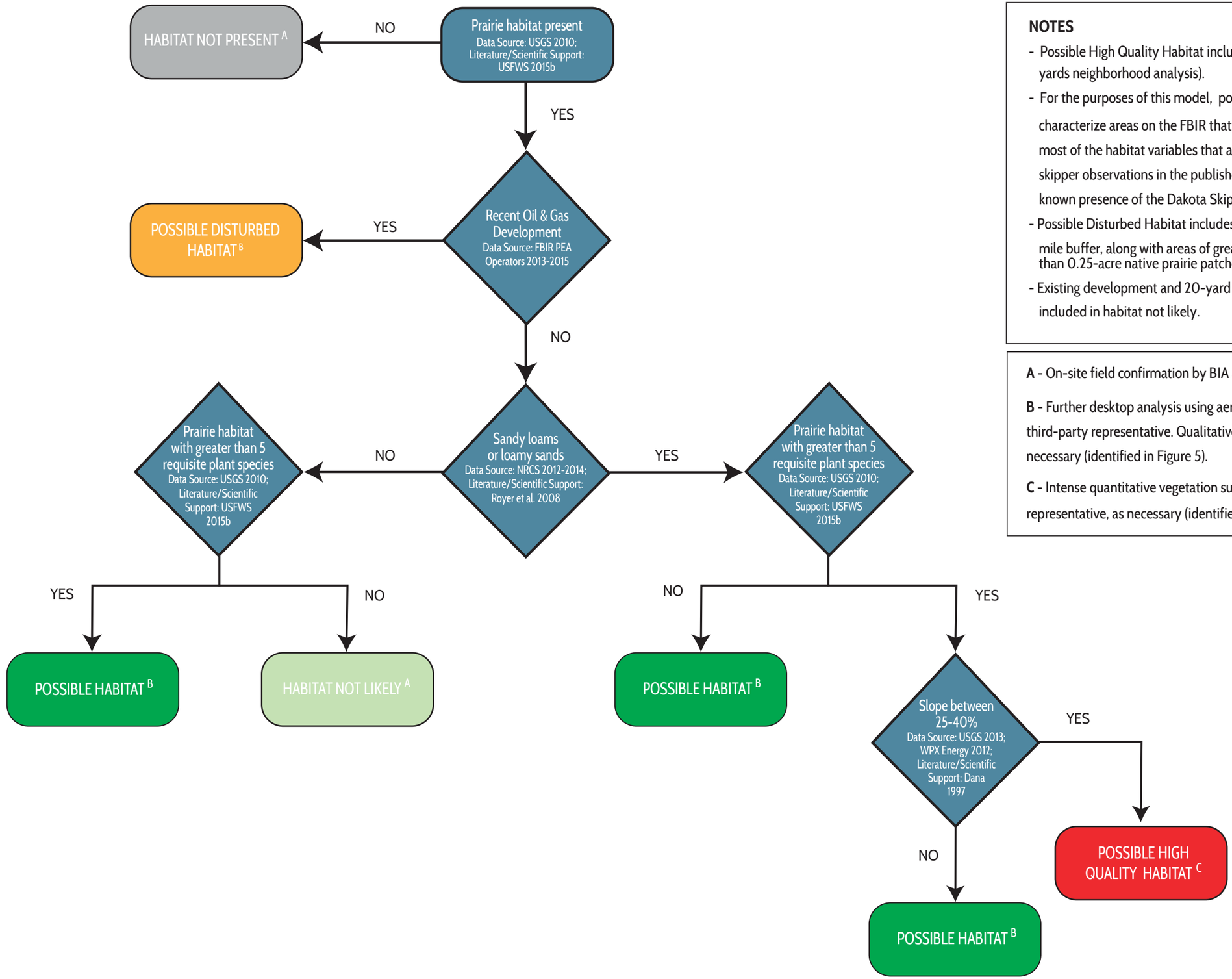
Dakota Skipper Habitat Suitability Model

The Dakota Skipper HSM is based on a desktop screening decision tree, as outlined in Figure 2. The decision tree, in coordination with the HSM outputs, classified the entire FBIR into the following general Dakota Skipper habitat quality categories: unlikely habitat/habitat not present, possible habitat, possible high quality habitat, and possible disturbed habitat. The HSM model applied coarse-to-fine-scaled filters for locating and ranking habitat polygons from not likely to possible high quality within the FBIR. For the purposes of this model, possible high quality habitat is used to characterize areas on the FBIR that have a greater likelihood of containing most of the habitat variables that are positively associated with Dakota skipper observations in the published literature (as discussed in Section 4.1). Please note that BIA considered many parameters (e.g., aspect, proximity to water, etc.) in developing the decision tree and the HSM; however, the final set of parameters used in the HSM reflects only those with existing GIS data and sound scientific support (i.e., based on published literature). Areas on the map that are classified as possible Dakota skipper habitat do not indicate known presence of the Dakota skipper or known habitat quality, rather they indicate where the species could potentially occur because of possible habitat as determined from GIS data layers. The following parameters and assumptions provide the basis of the desktop screening decision tree and HSM as outlined in Figure 2:

- **Presence of prairie habitat.** USGS (2010) datasets were used to determine whether prairie habitat exists and/or is available for the Dakota skipper within the FBIR. Prairie types considered include Western Great Plains tallgrass prairie, Central mixed grass prairie, Western Great Plains sand prairie, and Northwest Great Plains mixed grass prairie. If prairie habitat is not present in areas, then habitat is not present for the Dakota skipper in those areas.
- **Presence of existing development.** If oil and gas development (e.g., well pads, access roads, gathering lines, etc.) due to the prior actions of one or more of the eight operators is present within or adjacent to a proposed area for oil and gas development (proposed specific site for subsequent development), and the proposed project area contains native grasslands containing the preferred vegetation of the Dakota skipper, then the likelihood of the species being present is discountable when: (1) the patch size of the native grassland portion within the proposed project area is less than 0.25 acre; and (2) the project area occurs in an landscape setting (the project area plus a 0.62-mile buffer[1]) that has greater than 75 percent unsuitable habitat (where unsuitable is characterized by development, disturbed areas, forest, broken lands, agriculture, tame grasslands, etc.). Datasets for this parameter were received directly from the FBIR Programmatic Environmental Assessment (PEA) operators. The presence of existing development (with a 20-yard buffer) was also included in the HSM as habitat not likely for geospatial purposes and reasoning.

[1] As identified in 78 FR 63574, unless a site is within 0.62 mile of another site that generates a sufficient number of emigrants, the species' extirpation from the site is likely permanent.

FIGURE 2
Dakota Skipper Habitat Suitability Model Decision Tree



NOTES

- Possible High Quality Habitat includes polygons (clustered pixels within 25 yards neighborhood analysis).
- For the purposes of this model, possible high quality habitat is used to characterize areas on the FBIR that have a greater likelihood of containing most of the habitat variables that are positively associated with Dakota skipper observations in the published literature. These areas do not indicate known presence of the Dakota Skipper or known habitat.
- Possible Disturbed Habitat includes existing oil and gas development and 0.62-mile buffer, along with areas of greater than 75% disturbed areas, with less than 0.25-acre native prairie patches, per USFWS and BIA.
- Existing development and 20-yard buffer (geospatial purposes) is also included in habitat not likely.

A - On-site field confirmation by BIA and a qualified third-party representative.

B - Further desktop analysis using aerial imagery required by a qualified third-party representative. Qualitative habitat surveys will also be required, as necessary (identified in Figure 5).

C - Intense quantitative vegetation survey by a qualified third-party representative, as necessary (identified in Figure 5).

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- **Presence of sandy loams or loamy sands.** The NRCS (2012 – 2014) and Official Soil Description (OSD) (U.S. Department of Agriculture and Natural Resource Conservation Service [USDA and NRCS] 1994-2015) datasets were used to determine where sandy loams and/or loamy sands (hereon, "SL/LS") may be present throughout FBIR prairie habitat. OSDs for each individual soil series occurring within the FBIR were reviewed for references to loamy soils, specifically for SL/LS in the "Range of Characteristics" for soil texture ranges associated with each horizon. The horizon from the surface to a depth was considered in this model. The horizon was identified as either (1) the extent of the root zone or, (2) at the horizon at 30-inch depth (A horizon)[2]. Qualifiers in the description of the soil series from the NRCS (2012-2014) GIS attribute table were also incorporated to include SL/LS. As shown in Figure 2, SL/LS that are present within prairie habitat areas could be either possible habitat or possible high quality habitat. If SL/LS does not occur within prairie habitat areas, then possible habitat may occur or habitat is not likely to occur.
- **Requisite prairie habitat species.** Prairie habitat with the presence of more than five plant species that are common to Type B habitat and required for Dakota skippers' life history is considered "requisite prairie habitat". The plant species that make up requisite prairie habitat are shown in Table 1. If requisite prairie species are present, but SL/LS are not, then possible habitat may occur in these areas. If SL/LS are present, then another parameter should be considered (i.e., slope, as discussed in the next bullet).
- **Steep slopes.** National Elevation Datasets (USGS 2013) and WPX Energy (2012) Digital Elevation Model datasets, as available, were used to determine the presence and location of 25-40 percent slopes on FBIR. If changes in elevation (i.e., steep slopes, between 25-40 percent) are present within the requisite prairie habitat areas in areas with SL/LS, then possible high quality habitat may occur. If the steep slopes are not present, then possible habitat may occur.
- **GIS data corrections or adjustments.** The various GIS data used in the HSM are characterized by pixels, polygons, points, etc. In an attempt to "smooth" abrupt and discrete boundaries, the high quality habitat includes polygons and pixels that are within 25 yards of the surrounding polygons and pixels.

Figure 3 maps the entire area within the FBIR according to the following categories: possible high quality habitat, possible habitat, habitat not likely, and habitat not present. These categories were identified through the output of the HSM. Figure 4 maps the entire area within the FBIR as potentially disturbed or undisturbed, based on the location of existing disturbance from FBIR oil and gas operators. The polygons on this figure indicate areas of possible

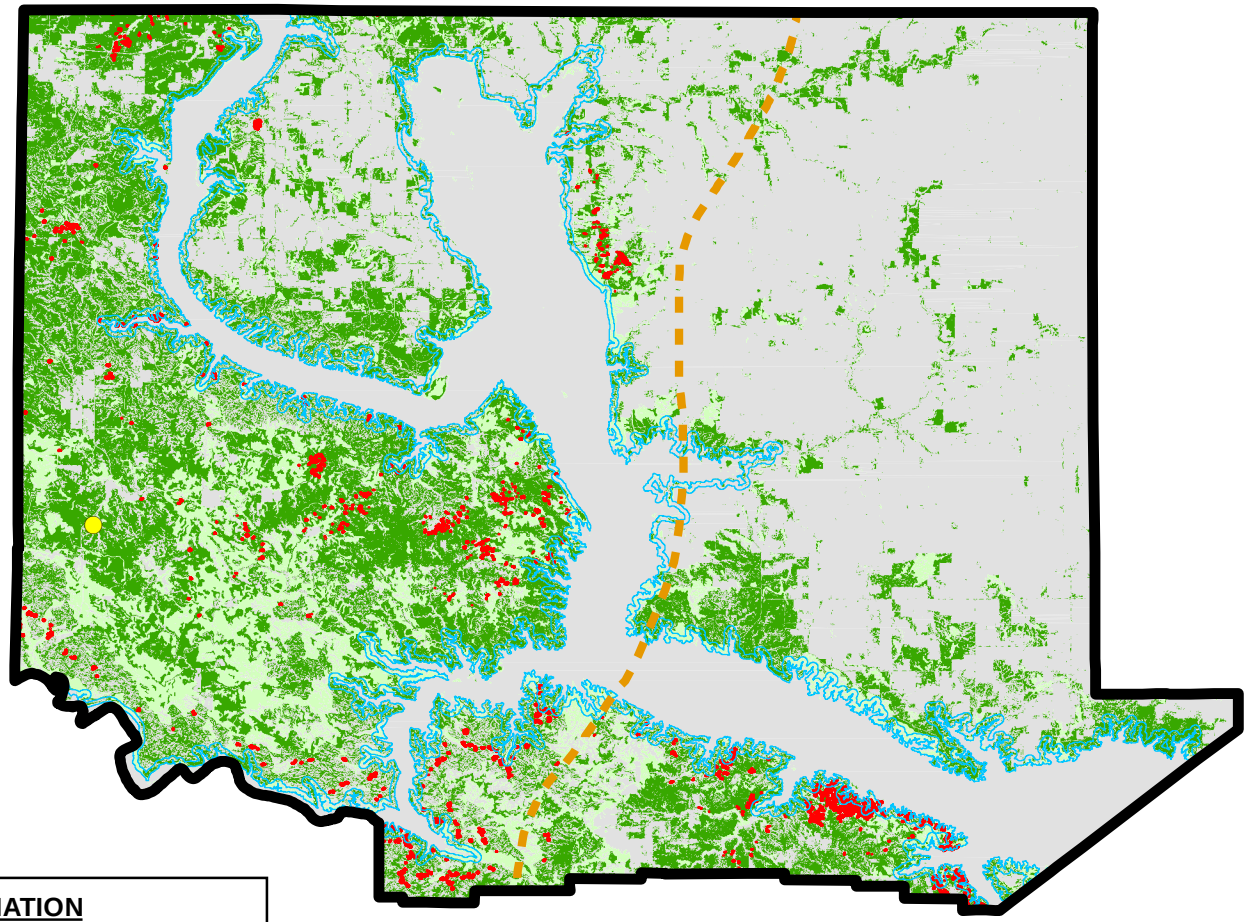
[2] Specifically, the "Typical Pedon" was reviewed to estimate in which horizon the root zone ended by searching each horizon description for an indication of root density (e.g., very few roots, few roots, etc.). It was assumed that the maximum extent of the root zone occurred in the immediately subsequent soil horizon to the soil horizon where the last indication of root density was made. The root zone depth was assumed to be no greater than 30 inches when the OSD did not reference root density in the "Typical Pedon" section. Note that this initial dataset was assembled in coordination with FBIR PEA Operator ecologists.

disturbance and were generated by placing a 0.62-mile buffer around existing oil and gas development. Areas are characterized as "possible disturbance" and further classified as unsuitable habitat or prairie habitat (for this category, prairie habitat includes all categories of prairie habitat, per USGS [2010]) for rapid assessment during both the desktop and field screening processes. Table 2 indicates the approximate acreage of possible high quality habitat, possible habitat, habitat not likely, and habitat not present categories for the Dakota skipper. Note there are no documented occurrences of the species within the areas of possible habitat, except as indicated in Section 4.1.4. It is also important to note that much of this prairie habitat is fragmented, rather than contiguous, and Dakota skippers are more prevalent in larger prairie patches with limited dispersal distances. Further, Royer et al. (2014) noted that Dakota skipper habitat is vulnerable to changes if less than 10 acres (Royer et al. 2014); therefore, the 247,900 acres estimate of possible prairie habitat is likely an overestimate. Nonetheless, these possible habitat areas will be field verified, as described below.

TABLE 2. ACREAGE AND PERCENTAGE OF POSSIBLE DAKOTA SKIPPER HABITAT WITHIN FBIR

	Approximate Total Acreage*	Approximate Percentage of the Project Area*
Possible High Quality Habitat	3,780	<1%
Possible Habitat	247,900	25%
Habitat Not Likely	92,500	9%
Habitat Not Present	669,500	66%

* Acreages and percentages are approximate due to rounding and geospatial outputs.



EXPLANATION

- DAKOTA SKIPPER EAGLE NEST BUTTE SITE
- BAKKEN LINE
- 1,000' HHWM SET BACK
- HABITAT NOT PRESENT
- HABITAT NOT LIKELY
- POSSIBLE HABITAT
- POSSIBLE HIGH QUALITY HABITAT

N

0 8 Miles

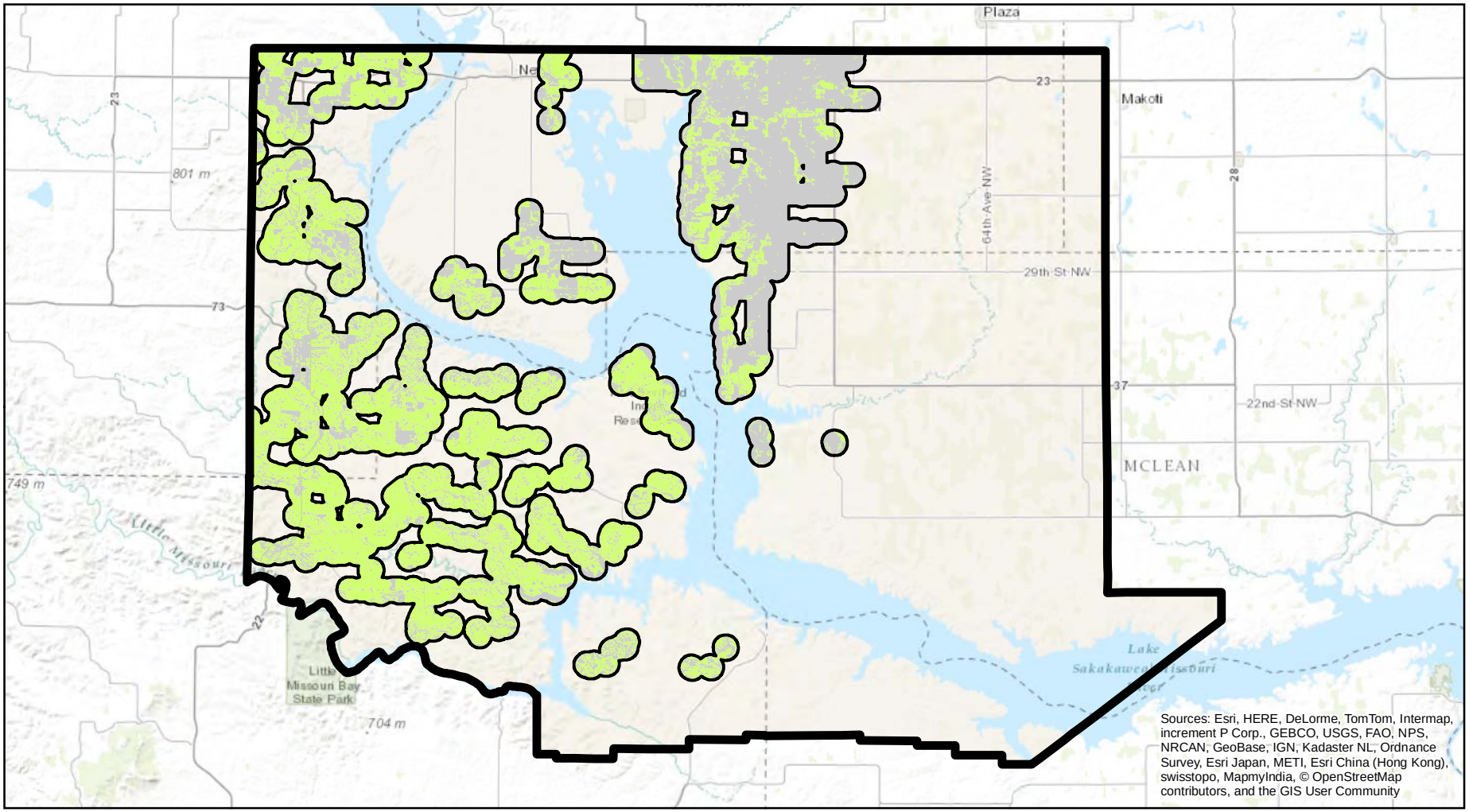
Trihydro CORPORATION
1252 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

FIGURE 3

DAKOTA SKIPPER HABITAT SUITABILITY MODEL

FORT BERTHOLD INDIAN RESERVATION PROGRAMMATIC BABE ADDENDUM

Drawn By: BR	Checked By: JM	Scale: 1" = 8 Miles	Date: 10/8/15	File: Fig3_DS_Suitability.mxd



EXPLANATION

- 0.62-MILE BUFFER FROM EXISTING OIL AND GAS DEVELOPMENT (Source: FBIR Operators 2013-2015)
- UNSUITABLE HABITAT
- PRAIRIE HABITAT

Note: Disturbed habitat includes the area within 0.62 mile buffer and all other areas are considered undisturbed.

N

0 8 Miles

Trihydro CORPORATION
1252 Commerce Drive
Laramie, WY 82070
www.trihydro.com
(P) 307/745.7474 (F) 307/745.7729

FIGURE 4

DAKOTA SKIPPER
POSSIBLE DISTURBED HABITAT

FORT BERTHOLD INDIAN RESERVATION
PROGRAMMATIC BABE ADDENDUM

Drawn By: BR	Checked By: JM	Scale: 1" = 8 Miles	Date: 10/9/15	File: Fig4_DS_DisturbHab.mxd

Dakota Skipper Field Survey Requirements for the HSM

If development is proposed on the FBIR, the operator is required to review the proposed project area (specific site) and determine whether the area has been categorized by the HSM as possible high quality habitat, possible habitat, habitat not likely, or habitat not present. In addition, an initial screen to characterize the area as possibly disturbed or undisturbed should also be completed. Figure 5 is a schematic decision tree detailing the required steps to be followed by the operator and their qualified third party representative (see Appendix A for descriptions of the qualifications needed). If a portion or all of the proposed project area (specific site) is located within possible disturbed habitat (Figure 4), the steps and process for possible disturbed habitat should take precedence (see Initial Screen below). Survey requirements and data analysis consider habitat quality as it relates to existing disturbance, the life history, and associated vegetation requirements for the Dakota skipper. As such, data collection is focused on identifying both the presence and abundance of native prairie species, requisite species, invasive species, and woody species. The following steps, depending on where the proposed project area (specific site) is positioned relative to the HSM results (Figures 3 and 4), would be required.

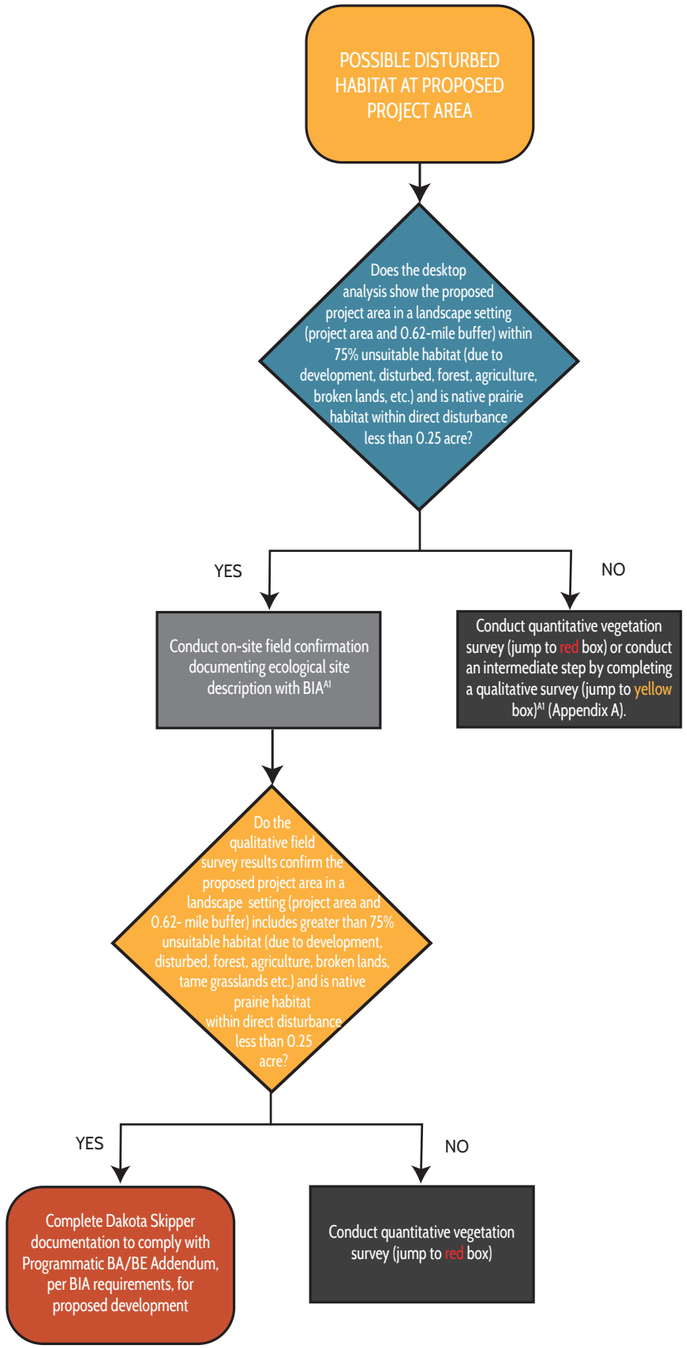
Initial Screen

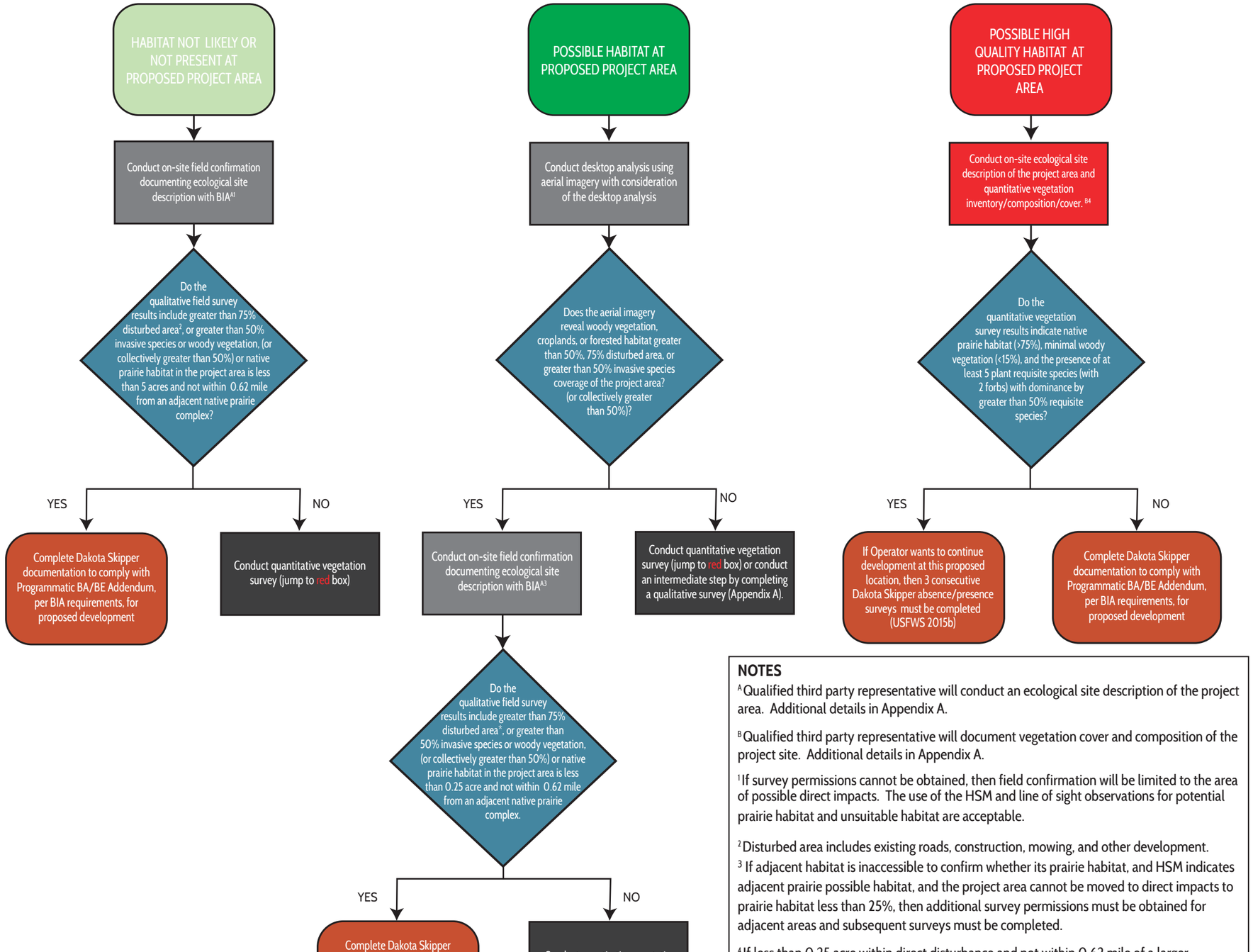
- If the proposed project area (specific site) is positioned in an area that is **possible disturbed habitat**, then a qualified third party representative would consider the desktop analysis relative to the specific site in a landscape setting for review of existing unsuitable habitat and native prairie habitat. If the following results are found during the desktop analysis, then a qualitative field survey performed by a qualified third-party representative (Appendix A) would be necessary to confirm the following landscape-scale conditions[3]:
  - Greater than 75 percent unsuitable habitat (development, disturbed areas, forest, broken lands, agriculture, tame grasslands, etc.) coverage of the proposed project area (specific site) in a landscape setting (project area and 0.62-mile buffer), and
  - Less than 0.25-acre native prairie habitat within the direct disturbance area (well pad and access road footprint)
- Depending on the qualitative field survey results, as outlined in Figure 5, a qualified third party representative would either document the findings of the qualitative survey indicating no suitable habitat present, per BIA requirements, or a follow-up quantitative vegetation survey would be required if the above results are not found.

[3] If survey permissions cannot be obtained, then field confirmation will be limited to the area of possible direct impacts. The use of the HSM and line of sight observations for potential prairie habitat and unsuitable habitat are acceptable. This applies to possible disturbed habitat, habitat not likely, and habitat not present from the HSM.

FIGURE 5

Dakota Skipper Survey Requirement Decision Tree





NOTES

[A] Qualified third party representative will conduct an ecological site description of the project area. Additional details in Appendix A.

[B] Qualified third party representative will document vegetation cover and composition of the project site. Additional details in Appendix A.

[1] If survey permissions cannot be obtained, then field confirmation will be limited to the area of possible direct impacts. The use of the HSM and line of sight observations for potential prairie habitat and unsuitable habitat are acceptable.

[2] Disturbed area includes existing roads, construction, mowing, and other development.

[3] If adjacent habitat is inaccessible to confirm whether its prairie habitat, and HSM indicates adjacent prairie possible habitat, and the project area cannot be moved to direct impacts to prairie habitat less than 25%, then additional survey permissions must be obtained for adjacent areas and subsequent surveys must be completed.

[4] If less than 0.25 acre within direct disturbance and not within 0.62 mile of a larger complex, then third-party representative can complete Dakota Skipper documentation to comply with Programmatic BABE Addendum, per BIA requirements, for proposed development.

Note: if the desktop analysis review does not reveal 75 percent unsuitable habitat in a landscape setting and less than 0.25-acre native prairie habitat within direct disturbance (well pad and access road footprint), then at the operator's discretion, they may proceed directly with the quantitative field survey or conduct an intermediate step by completing a qualitative survey (Appendix A).

Detailed Screen

- If the proposed project area (specific site) is positioned in an area that is either **habitat not likely** or **habitat not present**, then likely during the onsite meeting (or before), BIA would require a qualified third-party representative to conduct a qualitative ecological field survey of the proposed project area (detailed field habitat survey requirements are included in Appendix A). Depending on the qualitative field survey results, as outlined in Figure 5, a qualified third party representative would either document the findings of the qualitative survey[4], indicating no suitable habitat present, per BIA requirements, or a follow-up quantitative vegetation survey would be required if the following results are not found:
  - Greater than 75 percent disturbed area, or
  - Greater than 50 percent invasive species, or
  - Greater than 50 percent woody vegetation or
  - One or more of the above parameters collectively exceeds 50 percent, or
  - Native prairie habitat[5] in the proposed project area (specific site) is less than 5 acres (collectively or individually) and not within 0.62 mile from an adjacent native prairie complex.

    Note: the above percentages were established to be conservative for the species, as specific published values for plant species community composition are not available for the Dakota skipper. Numerous published studies describe the species' avoidance of disturbed habitats, dominance by invasive species, and woody vegetation without providing numerical estimates for the prevalence of these habitat characteristics. As such, percentages have been set high to allow for uncertainty of the species' selection of habitat.
- If the proposed project area (specific site) is positioned in an area that is **possible habitat**, then a qualified third party representative would conduct a more detailed desktop aerial imagery analysis of the specific site for review of disturbance, forested habitats, croplands, and invasive species. If the following results are found during the

[4] If survey permissions cannot be obtained, then field confirmation will be limited to the area of possible direct impacts. The use of the HSM and line of sight observations for potential prairie habitat and unsuitable habitat are acceptable. This applies to possible disturbed habitat, habitat not likely, and habitat not present from the HSM.

[5] Classifications for plant species to indicate native prairie habitat are determined by the USDA PLANTS database (USDA and NRCS 2015). The North Dakota Department of Agriculture (ND DOA) Noxious Weeds list (ND DOA 2015) will be secondarily reviewed for classifying plant species as native prairie species versus noxious weeds.

imagery aerial review, then a qualitative field survey performed by a qualified third-party representative (Appendix A) would be necessary[6]:

- Greater than 50 percent woody vegetation, croplands, or forested habitat, or
- Greater than 75 percent disturbed area, or
- Greater than 50 percent invasive species coverage of the proposed project area (specific site), or
- Two or more of the above parameters collectively exceeds 50 percent.

  Note: if the aerial imagery review does not reveal disturbance, forested habitats, croplands, or invasive species, then at the operator's discretion, they can determine if they want to proceed directly with the quantitative field survey or conduct an intermediate step by completing a qualitative survey (Appendix A).

- Depending on the qualitative field survey results, as outlined in Figure 5, a qualified third party representative would either document the findings of the qualitative survey indicating no suitable habitat present, per BIA requirements, or a follow-up quantitative vegetation survey would be required if the following results are not found:
  - Greater than 75 percent disturbed area, or
  - Greater than 50 percent invasive species, or
  - Greater than 50 percent woody vegetation, or
  - Two or more of the above parameters collectively exceeds 50 percent, or
  - Native prairie habitat[7] in the proposed project area (specific site) is less than 0.25 acre and not within 0.62 mile from an adjacent native prairie complex[8]. If the proposed project area (specific site) is positioned in an area that is **possible high quality habitat** then a third-party representative would conduct a quantitative vegetation survey. Detailed field habitat survey and data analysis requirements are included in Appendix A. Depending on the quantitative field survey results, as outlined in Figure 5, a qualified third-party representative would either document the findings of the quantitative survey, concluding no suitable habitat present, per BIA

[6] If adjacent habitat is inaccessible to confirm whether its prairie habitat, and HSM indicates adjacent prairie possible habitat, and the project area cannot be moved to reduce direct impacts to prairie habitat less than 25 percent, then additional survey permissions must be obtained for adjacent areas and subsequent surveys must be completed. This applies to possible habitat from the HSM.

[7] Plant species for native prairie habitat are determined by the USDA PLANTS database (USDA and NRCS 2015). The ND DOA Noxious Weeds list will be secondarily reviewed for classifying plant species as native prairie species versus noxious weeds.

[8] If adjacent habitat is inaccessible to confirm whether it is prairie habitat, and HSM indicates adjacent prairie possible habitat, and the project area cannot be moved to reduce direct impacts to prairie habitat less than 25 percent, then additional survey permissions must be obtained for adjacent areas and subsequent surveys must be completed. This applies to possible habitat from the HSM.

requirements, or additional Dakota skipper occurrence surveys would be required before any disturbance could occur at these areas if the following results are found[9]:

- Greater than 75 percent native prairie habitat and less than 15 percent woody vegetation, and
- The plant species that make up requisite prairie habitat are shown in Table 1; to accommodate both presence and abundance requirements, the following plant community characteristics must be present for an area to be considered "requisite habitat":
  - Five or more requisite species, two of which must be forbs
  - The community must be dominated by requisite species (as determined by dominance calculations identified in Appendix A)

As discussed above, field verified high quality habitat would not be modified or lost unless Dakota skipper occupancy surveys result in no Dakota skipper observations, per USFWS (2015b) requirements; or the prairie habitat areas impacted are less than or equal to 0.25 acre and not within 0.62 mile from a larger prairie complex. Additionally, development is not allowed or viable in some areas within the FBIR. Table 3 provides the total acres that are not planned for development due to the Bakken Fairway Boundary and the Historical High Water Mark (HHWM) (1,854 feet mean sea level). Of the 3,780 acres of possible high quality habitat identified from the HSM, approximately 870 acres (23 percent) are protected from development due to the restriction that no drilling or production activities will occur within the first 1,000 feet from the Lake Sakakawea HHWM. Figure 3 shows the HHWM and the possible high quality habitat that would not be impacted due to the restriction. Additionally, the Proposed Action is focused on development on the western portion of FBIR, as it is likely that there would not be any development east of the Bakken Fairway Boundary (Figure 3) because of the current understanding of the oil reserves. Approximately 1,450 acres of possible high quality habitat (38 percent of 3,780 acres) are within the eastern portion, where development is not likely.

TABLE 3. TOTAL ACRES NOT PLANNED FOR DEVELOPMENT

Areas Not Anticipated for Development	Approximate Acres*	Approximate Percentage of Possible High Quality Habitat
Land East of the Bakken Fairway Boundary	1,450	38%
Within the HHWM	870	23%

* Acreages and percentages are approximate due to rounding and geospatial outputs.

[9] If less than 0.25 acre and not within 0.62 mile of a larger complex, then third-party representative can complete Dakota Skipper documentation to comply with Programmatic BA/BE Addendum, per BIA requirements, for proposed development. This applies to possible high quality habitat from the HSM.

Another potential stressor from the Proposed Action could occur from the introduction of noxious weeds. As noxious weeds and other non-native species become established in an area, they often become dominant and subsequently replace the native vegetation. Replacement of the native grasses by non-native species may reduce food availability to both the adult and larval stages of Dakota skippers (Cochrane and Delphey 2002). To mitigate for potential effects to Dakota skippers from invasive species in disturbed areas, the Proposed Action includes conservation measures that are consistent with the Dakota Skipper Guidelines (USFWS 2007 and 2014a) (Section 5.1.2).

5.1.2 CONSERVATION MEASURES

Potential Stressor: Habitat Loss or Degradation

- Possible high quality habitat identified from the HSM will be verified via field quantitative vegetation surveys[10], per requirements in Figure 5 and Appendix A. Field verified high quality habitat would not be modified or disturbed unless Dakota skipper occupancy surveys result in no detections, per USFWS (2015b) requirements. Detailed field habitat survey requirements are included in Appendix A.
- Possible quality habitat identified from the HSM will be verified via qualitative field ecological system surveys[11], per requirements in Figure 5 and Appendix A. Follow-up quantitative vegetation surveys, if necessary, would be conducted and field verified high quality habitat would only be modified or developed if Dakota skipper occupancy surveys result in no detections, per USFWS (2015b) requirements. Detailed field habitat survey requirements are included in Appendix A.
- Habitat that is possibly disturbed, not likely or not present identified from the HSM will be verified via qualitative field ecological system surveys[12], per requirements in Figure 5 and Appendix A. Follow-up quantitative vegetation surveys, if necessary, would be conducted and field verified high quality habitat would only be modified or disturbed if Dakota skipper occupancy surveys results in no detections, per USFWS (2015b) requirements. Detailed field habitat survey requirements are included in Appendix A.

Reclamation measures that are included in the Proposed Action are in compliance with the BLM Gold Book, Three Affiliated Tribes, NDIC, and BIA requirements. These measures could result in an improvement of the disturbed area for Dakota skippers through reseeding and improving the habitat. The goal of interim reclamation is to reduce and

[10] If less than 0.25 acre within direct disturbance and not within 0.62 mile of a larger complex, then third-party representative can complete Dakota skipper documentation to comply with Programmatic BABE Addendum, per BIA requirements, for proposed development.

[11] If adjacent habitat is inaccessible to confirm whether its prairie habitat, and HSM indicates adjacent prairie possible habitat, and the project area cannot be moved to reduce direct impacts to prairie habitat less than 25 percent, then additional survey permissions must be obtained for adjacent areas and subsequent surveys must be completed.

[12] If survey permissions cannot be obtained, then field confirmation will be limited to the area of possible direct impacts. The use of the HSM and line of sight observations for potential prairie patches and unsuitable habitat are acceptable.

stabilize disturbed areas as rapidly as possible, and reclamation would be completed within six months of the well being drilled and completed, or the last well drilled and completed on a multi-well pad. Such reclamation measures include, but are not limited to those listed below:

- If a well is determined to be commercially viable, production equipment would be installed and the well pad would be reduced in size. Interim reclamation activities would include leveling, contouring, backfilling, re-seeding, and installation of erosion control measures, as appropriate. Stockpiled topsoil would be redistributed and re-seeded with native vegetation. Access roads and well pad areas would be reclaimed and would be contoured to match the approximate topography of the original landscape, and re-seeded with a native grass seed mixture consistent with surrounding native species (see Appendix A in the BABE [BIA 2014]). Revegetation would occur at the first seasonal opportunity, generally after October 15 until the ground is frozen, or before May 15. Grass seeding would continue until productivity is consistent with surrounding undisturbed vegetation and the BIA has determined that reclamation is complete.
- In accordance with NDIC requirements, a good and sufficient surety bond ranging from $25,000 to $50,000 would be required (depending on the method of geophysical exploration). If engaged by the geophysical exploration contractor, a good and sufficient surety bond in the amount of $10,000 would be required. The bond must cover all geophysical exploration and plugging operations conducted within one year of the date the bond is issued and must be automatically renewed. The NDIC would release the obligation of the bond if the NDIC determines the rules have been complied with, including the proper plugging of the well and seismic holes and reclamation of the surrounding affected area (NDIC 2009).
- Per BLM requirements, if the well and associated facilities are covered by an individual lease bond or by a statewide or nationwide bond; the period of liability would only be terminated once the final abandonment has been approved (BLM and U.S. Forest Service [USFS] 2007).
- To ensure that the reclamation requirements are being met, per NDIC requirements, prior to a well being plugged, the operator would file a Notice of Intent. A Subsequent Report would then be filed outlining the work completed during the plugging operation, and another Notice of Intent would be filed outlining the final reclamation work to be completed. Once the reclamation work has been completed, the NDIC would inspect the location and make a final determination for approval of the well site to be released from the bonding requirement.
- Per BLM and BIA requirements, following the plugging of a well, the operator must file a Subsequent Report Plug and Abandonment; a Final Abandonment Notice then must be filed by the operator upon completion of reclamation operations. Upon receipt of this notice, the surface management agency would inspect the site to ensure reclamation is fully successful and BLM would approve the project after reclamation is complete.

Potential Stressor: Habitat Degradation from Noxious Weeds

To mitigate against the potential effects to Dakota skipper from invasive species in disturbed areas, the Proposed Action includes conservation measures that are consistent with the Dakota Skipper Guidelines (USFWS 2007 and 2014a), including:

- The FBIR Noxious Weed Management Plan would be implemented (Appendix C in the BABE [BIA 2014]) to reduce the potential for noxious weeds to become established.
- Identified noxious weed infestations within the FBIR boundary would be treated with a BIA/BLM/U.S. Environmental Protection Agency approved herbicide prior to construction to prevent the spread of noxious weed infestations.
- Noxious weed inventories on the FBIR would be conducted twice a year (spring and fall) at each well pad site and access road. The operator is responsible for controlling noxious weeds for the life of the well (per control methods identified in Appendix C in the BABE [BIA 2014]).
- Prior to entry onto tribal lands, drilling rigs and associated equipment would be pressure washed or air blasted to prevent the possible transportation of noxious or undesirable vegetation onto tribal lands.
- Noxious weeds would be treated by chemical or mechanical means prior to construction with the approval of the BIA.
- Dakota skippers are vulnerable to fire at virtually all life stages and likely depended historically on repopulation from unburned areas to persist. The Dakota Skipper Guidelines provide direction on the best approach for using fire as a management tool. Fire is not included in the FBIR Noxious Weed Management Plan as an alternative for managing weeds on the FBIR.
- Techniques to attempt restoration could consist of a variety of activities (e.g., tree or brush removal, planting native species, etc.), depending on the site conditions and land-use history. As discussed above, these techniques would be applied at the earliest time possible and the native seed used would be consistent with the surrounding vegetation.
- Training would be provided to ensure that field crews recognize target weeds to avoid adverse effects to important native species.
- Sites would be managed to minimize the likelihood of invasion by weeds with methods described in Appendix C in the BABE (BIA 2014). Control methods that are necessary after invasion may have unintended consequences to Dakota skipper or other native species.

In addition, to further reduce habitat loss or degradation, the operators would utilize multi-well pads and maximize the use of 1,280-acre spacing units to allow for recovery of oil and gas from a minimum number of locations throughout the FBIR.

5.1.3 CUMULATIVE IMPACTS

Future actions on or near the FBIR that may impact Dakota skippers include other oil and gas development, wind power development, agricultural/rural, residential and commercial development, and climate change. Although all of these impacts cannot be specifically quantified at this time, these actions have occurred in the past and are likely to continue into the foreseeable future. Some specific examples can be provided to assess the potential cumulative effect to Dakota skippers, however, and are included below.

Oil and gas development is expected to continue into the future in areas surrounding FBIR. These developments would potentially remove, alter, or degrade habitat for Dakota skippers or cause disturbance. One example in which this type of development can alter habitat is through the increase of noxious weeds; however, measures are in place to avoid the spread of invasive species and field-verified high quality habitat would only be modified or disturbed if Dakota skipper occupancy surveys results in no detections.

Because the best places for wind energy development is in the Great Plains states, including Dakota skippers' range, prairie habitat can also be degraded or lost from wind energy development. Wind energy projects are likely located in remote rural areas, potentially prairie habitat. Just in North Dakota, approximately 21 wind energy centers are currently present, and another 13 are proposed (Natural Resources Defense Council [NRDC] 2014).

Agricultural/rural development could also affect Dakota skippers. Less than 20 percent of North Dakota's prairie exists today because much of it has been plowed for agricultural crops (Herman and Johnson 2008). Livestock grazing also has the potential to alter remaining prairie habitats from their natural state, resulting in the degradation of Dakota skipper habitat.

The conversion of natural habitat to residential or commercial development would result in the continued loss or degradation of prairie habitat for Dakota skipper. All future private, tribal, and state actions that may occur on the FBIR and in the surrounding areas would include some increase in the number of people in the area, either permanently or temporarily.

Climate change may also have a potential cumulative effect on Dakota skipper populations as habitats and individuals are affected by changes in temperature, precipitation, seasonality of precipitation, intensity of storms, etc. Many of the stressors discussed above can be exacerbated by climate change and the ability of Dakota skippers to adapt to changing conditions may be reduced (U.S. Global Change Research Program 2009). With the best available information, there is some evidence that climate change poses risks, but the specific nature of these risks is not evident.

When added to the other reasonably foreseeable future state, tribal, and private actions on or near the FBIR, the Proposed Action would incrementally add to the impacts on the Dakota skipper. However, through the implementation of the avoidance, minimization, reduction, and conservation measures (Section 5.1.2) listed for the Dakota skipper; the incremental impacts to the Dakota skipper would not be significant.

5.2 POWESHIEK SKIPPERLING

5.2.1 STRESSOR AND RESPONSE

While the Poweshiek skipperling has historically been observed in the state, the most recent observation was over 200 miles from the FBIR. Because, the Poweshiek skipperling is not known or believed to occur in any of the counties in the Project Area (USFWS 2014d) and the dispersal distance of the species is strongly limited (1 mile) (R. Westwood, University of Winnipeg, pers. comm., August 2012; R. Dana, pers. comm., 2012), individuals are not expected to occur on or near the FBIR.

5.2.2 CONSERVATION MEASURES

Given that there are no known reports of occurrence of the Poweshiek skipperling in the Project Area, no conservation measures would be implemented for the species.

5.2.3 CUMULATIVE IMPACTS

Future actions on or near the FBIR that may impact Poweshiek skipperlings include other oil and gas development, agricultural/rural development, and climate change. However, Poweshiek skipperlings are considered extirpated or possibly extirpated from North Dakota. Even though these actions have occurred in the past and are likely to continue into the foreseeable future, they are not likely to affect the Poweshiek skipperling on or near the FBIR.

5.3 RUFA RED KNOT

5.3.1 STRESSOR AND RESPONSE

There are no known or documented occurrences of the rufa red knot in the Project Area. The closest reported sighting of a red knot was approximately 80 miles east of FBIR in 1998 in North Dakota (eBird.org 2014). Recent geolocator data have indicated that one red knot made a stopover in northwest North Dakota potentially near the Project Area (exact location unknown) in 2010, and three red knots stopped in North Dakota in 2013 (D. Newstead pers. comm., May 16, 2014). However, North Dakota Heritage Inventory does not have any record of the rufa red knot occurring in North Dakota (C. Dirk, North Dakota Natural Resource Division, pers. comm., February 2014). Appendix B in the BABE (BIA 2014) provides potential stressor categories, along with potential stressor examples for the rufa red knot if it traversed over FBIR. The primary threats and stressor categories from the Proposed Action are described below.

If the rufa red knot were to traverse the FBIR during migration, the greatest potential stressor from the Proposed Action is loss or degradation of the species' potential migration habitat. Construction of well pads, roads, or other facilities in migratory habitat could result in the direct loss of suitable migratory habitat if the species traversed over FBIR. Though information is lacking on the specific noncoastal stopover habitats used by red knots (USFWS 2013c), potential migratory habitat within the Project Area could include sandy, gravel, or cobble beaches. This is similar habitat to the piping plover habitat (when foraging for mollusks and other invertebrates) surrounding Lake Sakakawea in the Project Area. Of these acres, 100 percent would be protected by operator-committed conservation measures, including avoidance of development within the first 1,000 feet of Lake Sakakawea and the use of closed loop systems (Section 5.3.2).

Additionally, if the species used FBIR as stopover habitat, the red knot would have the potential to be exposed to oil spills and leaks throughout the species' migration. Potential stressors from spills could degrade habitat and affect mollusks and invertebrate populations that red knots feed on. Spills could include a release of produced oil, chemicals from oil and gas operations, or produced water. Produced water is characteristically high in salts and could also affect habitat for red knots. Injury to birds from hazardous materials generally occurs through a poisoned food source, decrease in food supply, or habitat degradation. For example, mortality due to direct oiling of adults, including direct ingestion of oil or oil on their plumage, would directly affect the individual. It could cause direct mortality, cause them to lose their ability to fly, or result in severe problems in their digestive tract. Reduced reproductive success due to the transfer of hazardous materials or oil from adults to young and eggs could also occur. If spills occur in, or migrate to, a waterbody (i.e., Lake Sakakawea), then mortality or reduced reproductive success due to transfer of contaminated fish and/or feeding contaminated fish to young or a decreased food supply could be another effect (Arnold et al. 2002).

Shorebirds, such as red knots, are especially vulnerable to spills due to their feeding habitats being located in potentially oiled shoreline habitat (Henkel et al. 2012).

If spills occur in, or migrate to the shoreline to their habitat along Lake Sakakawea, the overall amount of habitat available to red knots would also be reduced. If this occurred, red knots might have increased mortality or reduced reproductive success due to lost or reduced habitat. Additionally, potentially hazardous materials could remain in the shorebirds environment for long periods and could be transferred up the food chain through the process of bioaccumulation (Arnold et al. 2002). BIA conducted a spill analysis of incident data, which can be found in Appendix D of the BABE (BIA 2014). Because of prevention and protective measures, there is a low likelihood of spills reaching a waterbody, including Lake Sakakawea; therefore, it is not likely that spills would affect red knots, if they traversed the Project Area.

5.3.2 CONSERVATION MEASURES

The following conservation measures would reduce any potential stressors as described above to red knots if they traversed over FBIR.

Potential Stressor: Spills and Habitat Degradation; Impacts to Individuals

Established protective measures for very sensitive water resource areas would be implemented, which would provide protection to red knot migratory habitat. In these areas, there would not be any development, or development would occur with the conservation measures listed below:

- No drilling or production activities within the first 1,000 feet from the Lake Sakakawea HHWM (1,854 feet mean sea level).
- No drilling or production activities (excluding pipelines and transportation/utility corridors) within 150 feet from wetlands, perennial, and intermittent streams (as identified at the onsite meeting).
- Closed loop drilling systems would be implemented on the FBIR lands over which BIA has jurisdiction.

5.3.3 CUMULATIVE IMPACTS

Future actions on or near the FBIR that may impact rufa red knots, include other oil and gas development, wind farm development, water control measures, recreation, residential and commercial development, and climate change. Not all of these impacts can be specifically quantified at this time, but these actions have occurred in the past and are likely to continue into the foreseeable future. Although the species' historical migratory strategy has been highly variable, rufa red knots are not likely to be impacted by the cumulative impacts on FBIR, since the closest reported sighting was

approximately 80 miles from the FBIR, and the North Dakota geolocator results in 2013 only indicated three occurrences in North Dakota. Some specific examples can be provided to assess the potential, yet not likely, cumulative effect to rufa red knots and are included below.

Oil and gas development has expanded substantially on the FBIR and in surrounding areas in the past decade, and would potentially remove, alter, or degrade potential migratory habitat for the red knot, if the species used the FBIR as a stopover during migration. However, the beaches are usually avoided for development, so direct potential migratory habitat removal is not likely. Spills associated with this oil and gas development could affect potential migratory habitat for the red knot, particularly if spills migrate into the Missouri River. Farming and agriculture will typically use pesticides that could migrate to Lake Sakakawea or the Missouri River and its tributaries. If these chemicals migrate to Lake Sakakawea or the Missouri River and its tributaries, foraging habitat and prey could be contaminated which could harm the red knot.

Because the best places for wind energy development is in the Great Plains (13 additional centers proposed in North Dakota [NRDC 2014]), red knots may also be susceptible to direct mortality from collisions with turbines or avoidance of habitat where turbines are constructed. However, this development is not likely to greatly affect them since only five birds in 2010 with geolocators used the Northern Great Plains as a stopover (Saskatchewan, Canada, and North Dakota, U.S.).

Water control mechanisms on Lake Sakakawea and the Missouri and Platte rivers within surrounding areas can also eliminate potential migratory habitat for the red knot. Channelization, bank stabilization, and construction of reservoirs to meet flood control, hydroelectric and navigation objectives have all contributed to the degradation or loss of potential migratory habitat for the red knot.

Recreation activities in the region typically do not result in the creation of new public facilities so there would be no direct loss to potential migratory red knot habitat. However, the presence of people (e.g., fishers) in an area could displace red knots into otherwise suboptimal habitats.

Similar to oil and gas development, the conversion of natural habitat to residential or commercial development would result in the continued loss or degradation of potential migratory habitat for red knots in the area, if they occur within the Project Area. All future private, tribal, and state actions that may occur on the FBIR and in the surrounding areas would include some increase in the number of people in the area, either permanently or temporarily. However, similar to the other species already discussed, it is not likely that development would take place along Lake Sakakawea, nor the rivers, therefore, it is not likely to directly remove potential migratory habitat for red knots.

Climate change is also a potential cumulative effect to rufa red knots since the species and its migratory habitats are affected by changes in temperature, precipitation, seasonality of precipitation, intensity of storms, etc. Many of the stressors discussed above can be exacerbated by climate change and their ability to adapt to changing conditions may be reduced (U.S. Global Change Research Program 2009), but the specific nature of these risks is not evident on the FBIR and surrounding areas since the rufa red knot is not likely found in the area.

When added to the other reasonably foreseeable future state, tribal, and private actions on or near the FBIR, the Proposed Action could incrementally add to the impacts on the red knots, yet it is not likely since only a few observations of the species have been identified in the Great Plains.

5.4 NORTHERN LONG-EARED BAT

5.4.1 STRESSOR AND RESPONSE

No known occurrences of the northern long-eared bat have occurred in the Project Area; occurrences have been documented only in the state, but in the Turtle Mountains, the Missouri River Valley, and in the Badlands. However, North Dakota Heritage Inventory does not have any record of the northern long-eared bat occurring in North Dakota (C. Dirk, North Dakota Natural Resource Division, pers. comm., February 2014). Appendix B of the BABE (BIA 2014) provides potential stressor categories, along with potential stressor examples for the northern long-eared bat. The primary threats and stressor categories from the Proposed Action, if found on the FBIR are described below.

Even though no other threat to the northern long-eared bat is as severe as the white-nose syndrome, other sources of mortality, though not observed to cause significant population declines, include impacts to hibernacula, loss or degradation of its summer habitat, and exposure to toxins and contaminants (USFWS 2015c; Hein 2012).

Generally, North Dakota has no deposits of thick carbonate rocks at or near the surface except for the Killdeer Mountains in North Dakota. There are several features in the state that have historically been referred to as caves and are located south/southwest of the FBIR (Murphy 2007). There are no known hibernacula within North Dakota, though there is very limited survey effort in the state (H. Riddle, USFWS, pers. comm., February 2012).

As described in Section 4.4.1, the USFWS published an interim 4(d) rule under the ESA that exempts incidental take from all activities if a non-federal project meets certain criteria. Although, no impacts to the species are expected, the key to the interim 4(d) rule was used (USFWS 2015d) to further support the analysis in determining that no purposeful take of an individual would occur. The USFWS describes purpose take as all or part of a proposed action is to handle the bats in a way that may result in harm, harassment, or killing of bats (USFWS 2015e). The first consideration of the

interim 4(d) key was to identify the location of the proposed project in relation to the mapped range of the northern long-eared bat. The Project Area is located within the northern long-eared bat range, but no take is expected under the Proposed Action, which is the next consideration in the 4(d) rule. However, in an effort to be more conservative for the species conservation, further review of the interim 4(d) rule requires consideration of whether the Proposed Action would take place in the mapped white-nose buffer zone. The Project Area is located outside the white-nose syndrome buffer zone (USFWS 2015e), and the resulting determination was that limited amounts of incidental take, if they were to occur, would be allowed in the Project Area (though incidental takes are not expected, as described above) under the interim 4(d) rule. In addition, the conservation measures listed below (Section 5.4.2) generally follow the measures listed in the interim 4(d) rule that must be followed for areas located within the white-nose syndrome buffer zone.

The construction of well pads, roads, or other facilities in northern long-eared bat's summer habitat could also result in the direct loss of suitable summer and foraging habitat if presence of the bat was detected. The long-eared bat requires forested hillsides and ridges for its summer and foraging habitat; however, the Project Area consists of 7 percent (73,768 acres) of woodland habitat. The onsite meeting and review process/evaluation of each location requires woody vegetation be avoided to the extent possible, thus the potential to disturb woody vegetation is minimal and not likely to occur under the Proposed Action. If specific sized diameter trees cannot be avoided between April and September, then a species occupancy survey would be conducted.

In addition, under the Proposed Action, only closed-loop systems would be used; therefore, there would not be any open holding ponds. This would eliminate the possibility that the northern long-eared bat would be exposed to toxins or contaminants through the presence of holding ponds.

5.4.2 CONSERVATION MEASURES

Even though there are no known hibernacula on the FBIR, the following conservation measures would be implemented.

Potential Stressor: habitat loss or degradation to hibernacula

- If forested upland habitat is identified during the onsite meeting, generally BIA would require operators to leave the habitat intact to the greatest extent possible. If any tree (with a diameter of greater than 2 to 3 inches) removal activities cannot be avoided between April and September, then northern long-eared bat occupancy surveys would be conducted.
- If any suitable roost sites, possible hibernacula, or the species are observed during the onsite meeting, then any steps taken to avoid and minimize disturbance of this habitat would be documented.

In addition, to further reduce habitat loss or degradation, the operators would utilize multi-well pads and maximize the use of 1,280-acre spacing units to allow for recovery of oil and gas from minimal locations throughout the FBIR.

5.4.3 CUMULATIVE IMPACTS

Future actions on or near the FBIR that may impact northern long-eared bat include other oil and gas development, wind farm development, recreation, residential and commercial development, and climate change. These actions have occurred in the past and are likely to continue into the foreseeable future, however, they are not likely to affect the northern long-eared bat on or near the FBIR since the species is only documented in the Turtle Mountains, the Missouri River Valley, and in the Badlands in the summer, and no hibernacula are known within North Dakota. Some specific examples can be provided to assess the potential cumulative effect to the northern long-eared bat and are included below.

Oil and gas development has expanded substantially on the FBIR and in surrounding areas in the past decade, and is expected to continue into the future. These developments would potentially remove, alter, or degrade summer habitat or hibernacula for the northern long-eared bat, if they were present. During hibernation, bats are vulnerable to human disturbance as their energy stores are depleted when they are aroused and this may cause them not to survive the winter; or females may not successfully give birth or rear young (USFWS 2015c).

The best place for wind energy development is in the Great Plains, approximately 21 wind energy centers are in North Dakota, and another 13 are proposed (NRDC 2014). Even though northern long-eared bat has not been observed on or near FBIR, wind turbines can kill bats in the Great Plains, including northern long-eared bats, though only a small number of instances have been documented to date (USFWS 2015c).

Recreation activities in the region typically do not result in the creation of new public facilities so there would be no direct loss to northern long-eared bat habitat, particularly since they have not been observed on or near the FBIR. However, the presence of people in an area could disturb hibernating bats, particularly if recreation efforts include exploration of caves.

The conversion of natural habitat to residential or commercial development would result in the continued loss or degradation of habitat for northern long-eared bats in the area. Additionally, the construction of gates or other structures to exclude people from caves and mines can restrict bat flight and movement and change airflow and internal cave and mine microclimates. This is not likely to impact northern long-eared bat on or near the FBIR, though.

Climate change is also a potential cumulative effect to northern long-eared bats as their habitats and individuals are affected by changes in temperature, precipitation, seasonality of precipitation, intensity of storms, etc. Many of the stressors discussed above can be exacerbated by climate change and their ability to adapt to changing conditions may be reduced (U.S. Global Climate Research Program 2009). With the best available information, there is some evidence that climate change poses risks, but the specific nature of these risks is not evident, especially on or near the FBIR.

When added to the other reasonably foreseeable future state, tribal, and private actions on or near the FBIR, the Proposed Action could incrementally add to the impacts on the northern long-eared bats. However, because northern long-eared bats have not been observed on or near FBIR, these cumulative impacts would not affect them.

6.0 CONCLUSION AND DETERMINATION OF EFFECTS

6.1 CONCLUSION

Oil and gas development has expanded substantially on the FBIR and in surrounding areas in the past decade, and is expected to continue into the future (J. Hunt, Department of the Interior, pers. comm., August 2011). These developments would potentially remove, alter, or degrade habitat for the Dakota skipper and the rufa red knot. Potential stressors were discussed, along with conservation measures that are included in the Proposed Action. The following section (Section 6.2) provides the determination of effects for each species concluded from the analysis of the Proposed Action stressors to the sensitive species and their response.

6.2 DETERMINATION OF EFFECTS

This section of the addendum to the BABE evaluates the potential of the Proposed Action to result in adverse effects to the endangered and threatened species previously discussed in the document. An effects determination statement of *no effect*; *may affect, but not likely to adversely affect*; or *may affect, likely to adversely affect* is provided for each listed threatened or endangered species.

6.2.1 DAKOTA SKIPPER

Based on the analysis of the Proposed Action, the current status of the Dakota skipper in the FBIR, and incorporation of avoidance or minimization measures to address stressors listed in this addendum, it is determined that implementation of the Proposed Action **may affect, but not likely to adversely affect** the Dakota skipper.

6.2.2 POWESHIEK SKIPPERLING

Based on the analysis of the Proposed Action, the current status of the Poweshiek skipperling in the FBIR, it is determined that implementation of the Proposed Action would have **no effect** on the Poweshiek skipperling.

6.2.3 RUFA RED KNOT

Based on the analysis of the Proposed Action, the current status of the rufa red knot in the FBIR, and incorporation of avoidance or minimization measures to address stressors listed in this addendum, it is determined that implementation of the Proposed Action would have **no effect** on the rufa red knot.

6.2.4 NORTHERN LONG-EARED BAT

Based on the analysis of the Proposed Action, the current status of the northern long-eared bat in the FBIR, and incorporation of avoidance or minimization measures to address stressors listed in this addendum, it is determined that implementation of the Proposed Action would have **no effect** on the northern long-eared bat.

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APPENDIX A

DETAILED DAKOTA SKIPPER FIELD HABITAT SURVEY REQUIREMENTS

APPENDIX A. DETAILED DAKOTA SKIPPER FIELD HABITAT SURVEY REQUIREMENTS

Ecological Site Survey Qualitative Requirements

A qualified third-party representative will conduct a qualitative ecological site description of the proposed project area during or before the onsite meeting, along with appropriate analysis and reporting. The representative is considered qualified if the individual is trained in biological sciences and/or has equivalent field experience. The proposed project area may contain more than one ecological site description; therefore, the proposed project area will be broken out by percentages of each ecological site based on general field surveys[1].

Qualitative surveys are intended to be ocular estimates that verify results from the desktop screening approach or, alternatively, reveal the need for follow-up quantitative surveys. They also provide basic ecological information about the area. Data to be collected during the qualitative surveys include the following:

- List of dominant plant species
- Estimates of total plant cover at the project area, along with an estimate of cover by major growth forms (grass, forb, and shrub)
- Estimate of vertical structure of the vegetation
- Topography (slope, aspect, elevation, landform)
- Photographs that capture the landscape setting as well as dominant vegetation components
- General soil characterization

Quantitative Vegetation Survey Requirements

A qualified third-party representative will conduct a quantitative vegetation survey of the project area[1], along with appropriate analysis and reporting. The representative is considered qualified if the individual: 1) is trained in biological sciences and/or has equivalent field experience, and 2) has significant experience in plant identification and survey methodologies in this ecosystem. The purpose of quantitative vegetation surveys is to evaluate habitat quality as it relates to the life history and associated vegetation requirements for the Dakota skipper[1]. As such, data collection is focused on identifying both the presence and abundance of requisite species, woody species, and invasive species. To prevent the need for follow-up vegetation surveys, the recommended survey window is May 1 through October 15, with the month of June as the ideal time for accurately identifying forb species. Initial surveys may be conducted outside of the recommended survey window, but they should be limited to periods during which snow cover is absent. The results of initial surveys should be considered preliminary, however, and they may be used to determine the absence of habitat if the following vegetation conditions are identified and operator will complete Dakota Skipper documentation to comply with Programmatic BA/BE Addendum, per BIA requirements, for proposed development:

1. Greater than 50% of total plant cover consists of one or more invasive species whose identities can be confidently determined based on present senesced vegetation
2. Greater than 50% of total plant cover consists of woody species (shrubs)
3. The area is significantly disturbed and consists of greater than 50% bareground

[1] The field surveys will need to be resurveyed after 5 years of the initial survey if disturbance has not occurred.

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A qualified third-party representative will conduct a quantitative vegetation survey using point intercept or Daubenmire methodologies. The area to be characterized in the evaluation should consist of the anticipated area that will be disturbed during development in addition to adjacent habitats surrounding the area. Survey locations should be placed to characterize this area as a whole. At the landscape scale, prairie habitat and subsequently Dakota skipper habitat quality can be heterogeneous and patchy, and surrounding the project area will ensure that the habitat immediately adjacent to the project area is also considered in the final habitat quality determination. Cover should be identified using the following categories: plant (record species), litter, bareground, and rock.

Point-intercept method: Data should be collected along a minimum of four randomly located 50-m transects within each ecological site, and measurements should be taken at 1-m increments. A minimum of 200 points per cover type should be sampled to increase the likelihood that sparsely distributed forbs are detected during the surveys (Elzinga et al. 1998). More transects may be needed based on vegetation heterogeneity. Percent cover is determined by the number of "hits" along transects. Final vegetation estimates for native species cover, woody plant cover, invasive species cover, and requisite species cover must include a 90% confidence interval computed around the mean values estimated from the vegetation surveys.

Daubenmire method: Data should be collected from within a minimum of ten randomly located 0.25-m Daubenmire frames. Aerial cover should be estimated so that total cover sums to 100% within each frame; however, plants must be rooted within the frame to be counted towards total cover. More Daubenmire frames may be needed based on vegetation heterogeneity. Final vegetation estimates for native species cover, woody plant cover, invasive species cover, and requisite species cover must include a 90% confidence interval computed around the mean values estimated from the vegetation surveys.

Auxiliary data collection: After the line transect or Daubenmire frame has been laid out, but before collecting the data, a photograph of the transect/frame should be taken with transect/frame identification information and the date clearly visible. GPS coordinates of the transect/frame should also be recorded so that the location can be re-visited if needed.

The vegetation cover of the project area should also be documented with high quality digital photos. Photos will be taken in the four cardinal directions from the center stake, providing a clear depiction of vegetation on the proposed location.

The slope of the project area should also be documented using a clinometer. If the slope varies within the project area, several measurements should be taken to document this. Aspect of the slope should also be documented.

Data Analysis and Determining Dominance:

Data collected along transects will be aggregated for the project area so that mean values can be assigned to the following categories:

- Percent cover by invasive species
- Percent cover by woody vegetation

- Percent cover by native prairie species[2]
- Percent cover by Dakota skipper requisite species
- Percent cover of each species

Dominance will be determined by assessing mean cover of requisite species versus other species identified during quantitative vegetation surveys. Requisite species dominance occurs under the following conditions:

- Mean cover by a single requisite species exceeds 50%
- More than 50% of the dominant species, as determined by individual species cover, are requisite species. The 50/20 rule should be used to identify dominant species. Steps in selecting dominant species are as follows:
  - Rank all species from most to least abundant according to absolute cover percentages.
  - Select plant species from the ranked list, in decreasing order of coverage until the cumulative coverage of selected species exceeds 50% of total coverage. If two are more species are equal in coverage, they should be selected. The selected plant species are considered to be dominants.
  - In addition, select any other species that, by itself, is at least 20 percent cover.
  - Generate a count for dominant requisite species and dominant other species.
  - If the percent dominant requisite species exceeds 50% (as calculated by dominant requisite species divided by dominant other species x 100%), than dominance by requisite species has been achieved.

[2] Classifications for plant species to indicate native prairie habitat are determined by the U.S. Department of Agricultural PLANTS database (USDA and NRCS 2015). The North Dakota Department of Agriculture (ND DOA) Noxious Weeds list (ND DOA 2015) will be secondarily reviewed for classifying plant species as native prairie species versus noxious weeds.