

# 2023 North Dakota

Dakota Skipper (Hesperia dacotae) Survey Report

Northern Long-Eared Bat (*Myotis septentrionalis*) Habitat Assessment

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## 1 Introduction

Summit Carbon Solutions, LLC (Summit) is preparing for construction of the SCS Midwest Carbon Express (MCE) Project (Project). The Project encompasses a proposed carbon dioxide pipeline in Minnesota, Iowa, Nebraska, South Dakota, and North Dakota and sequestration facilities in North Dakota. This report is specific to North Dakota, species surveys and habitat assessments for other states along the Project are discussed separately.

The species discussed in this report were identified through informal consultation with the U.S. Fish and Wildlife Service (Service) (informal consultation between Summit and the Service, January 25, 2022). Other federally listed species, such as whooping crane (*Grus americana*), may also be present along the route in North Dakota; however, the Service determined that survey for these species was not required since Summit would implement mitigation measures that would avoid impacts to these species. Mitigation measures include actions such as pausing construction when whooping cranes are observed migrating through the Project site or trenchless crossing of the Missouri River which would avoid impacts to piping plover (*Charadrius melodus*).

Species and data discussed in this report include:

- 2023 survey methodologies and results for Dakota skipper (*Hesperia dacotae*), a federally listed threatened species of butterfly in North Dakota; and
- the results of a desktop habitat assessment in North Dakota for northern long-eared bat (NLEB) (*Myotis septentrionalis*).

Western prairie fringed orchid (*Platanthera praeclara*) is also a federally listed species that occurs in North Dakota and that could occur along the Project. However, suitable habitat for this species is highly limited on the route in North Dakota, only one site of potential habitat was identified in North Dakota; this site was surveyed in 2022 and no orchids were located nor was habitat suitable for the species present (SCS 2022). A desktop review of the current North Dakota route did not locate any other potentially suitable habitat; consequently, western prairie fringed orchid is not discussed in this report although results are available in the 2022 survey report (SCS 2022).

Surveys were completed for Dakota skipper in 2022 (SCS 2022a). No Dakota skipper were observed during the survey effort and suitable habitat along the route was extremely limited. The results of 2023 survey are included in this report as well as an assessment of potentially suitable habitat on the current route in North Dakota which could not be surveyed during the appropriate season in 2023.

Surveys for NLEB have not been required on the Project. However, the NLEB was listed as an Endangered species by the Service on November 29, 2022 (87 FR 73488), with a final rule effective date of March 31, 2023 (88 FR 4908). As part of the listing effort, the Service created a *Standing Analysis and Implementation Plan – Northern Long-Eared Bat Assisted Determination Key. Version 1.1* (USFWS 2023b) for identifying suitable habitat and potential consultation or mitigation measures. This report implements those measures for habitat analysis in North Dakota and describes the results of that effort. In particular, this report is intended to assess the likelihood that a wooded area crossed by the proposed Project in North Dakota could provide suitable summer roosting, foraging, and commuting habitat for NLEB. This assessment was completed at both a stand level relative to stand habitat characteristics, as well as at a landscape level to assess the connection among or between habitats.

# 2 Dakota Skipper 2023 Survey and Results

#### 2.1 Habitat Assessment

The Service has defined two types of Dakota skipper habitat, Type A and Type B (USFWS 2022a). Type A habitat consists of low wet-mesic prairie with little topographic relief that occurs on near-shore glacial lake deposits. Type B habitat occurs in the western extent of the Dakota skipper's range, on rolling terrain over gravelly glacial moraine deposits.

Dakota skippers are obligate residents of undisturbed, high-quality prairie including wet-mesic tallgrass prairie and dry-mesic mixed grass prairie in North Dakota, South Dakota, Minnesota, and Canada (Royer and Marrone 1992); they do not inhabit "non-native grasslands, weedy roadsides, tame hayland, or other habitats that are not remnant prairie, including reconstructed prairie (USFWS 2018; 2021; 2022a). According to the Service:

"High-quality prairie contains a high diversity of native species, including flowering herbaceous species (forbs). Degraded habitat consists of a high abundance of non-native plants, woody vegetation, and a low abundance of native grasses and flowering forbs available during the larval growth period and a low abundance of native flowering forbs available during adult nectaring periods. Therefore, based on the information above, we identify the necessary physical or biological features for the Dakota skipper as nondegraded native tallgrass prairie and native mixed-grass prairie habitat devoid of non-native plant species, or habitat in which non-native plant species and non-native woody vegetation are maintained at levels that allow persistence of native tall grass species and forbs and, therefore, the persistence of the Dakota skipper" (USFWS 2015).

Recently, the Service amended this definition somewhat by noting that within Type A habitat three species are almost always present and blooming during the Dakota skipper's flight period: prairie lily (Lilium philadelphuses), bluebell bellflower (Campanula rotundifolia), and mountain deathcamas (smooth camas; Zigadenus elegans) (USFWS 2022a). In particular, mountain deathcamas is a strong indicator of Dakota skipper Type A habitat in North Dakota (USFWS 2022a). For Type B habitat, the Service notes that this habitat typically supports a high diversity and abundance of native forbs including: purple prairie clover (Dalea purpurea), white prairie clover (D. candida), yellow sundrops (Calylophus serrulatus), lambstongue groundsel (Senecio integerrimus), groundplum milkvetch (Astragalus crassicarpus), eastern pasqueflower (Pulsatilla patens), old man's whiskers (prairie smoke, Geum triflorum), western silver aster (Symphyotrichum sericeum), dotted blazing star (Liatris punctata), tall blazing star (L. aspera), meadow zizia (heartleaf golden alexanders; Zizia aptera), blanket flower (Gaillardia sp.), prairie sagewort (Artemisia frigida), and leadplant (Amorpha canescens) (USFWS 2022a).

Non-native grasses such as smooth brome (*Bromus inermis*) or Kentucky bluegrass (*Poa pratensis*), as well as non-native forbs such as Canada thistle (*Cirsium arvense*) or leafy spurge (*Euphorbia esula*), often outcompete native prairie vegetation and lead to the deterioration or elimination of Dakota skipper habitat (USFWS 2015). Smooth brome and Kentucky bluegrass in particular pose the greatest threat to native plant composition in Dakota skipper habitat (USFWS 2018). Further, pastures and prairies that are dominated by non-native grasses and forbs, or areas of cultivation, fragment habitat for Dakota skipper which may be incapable of moving more than 0.6 miles between patches of high-quality prairie habitat (USFWS 2014; 2018). The loss of habitat is the greatest factor in the decline of Dakota skipper (USFWS 2014, Davis 2020).

Because Dakota skipper have very specific habitat requirements, identifying suitable habitat for occupancy surveys is a key step in determining where, or if, to conduct surveys (USFWS 2022a). Potential locations of suitable habitat for Dakota skipper within the Project footprint were discussed with the Service in January 2022 (informal consultation January 25, 2022). The Service recommended using modeled Dakota skipper habitat (USFWS 2022b) to help identify landscape-level areas that have historically supported the species, combined with recent records of Dakota skipper presence, aerial imagery, and any field data to determine potentially suitable Dakota skipper habitat. The Service also noted that if occupancy surveys could not be completed due to the short flight window, weather constraints, or lack of access, that determining habitat suitability in lieu of occupancy surveys was appropriate and the best alternative (informal consultation January 25, 2022).

Based on this direction, WESTECH utilized a variety of measures to identify potentially suitable habitat on the Project prior to field investigation, including a review of: a) mapped Dakota skipper habitat (USFWS 2022b); b) Dakota skipper occupancy records (USFWS 2018; Davis 2020); c) aerial imagery; d) vegetation and wetland surveys completed in 2022 as well as spring surveys in 2023; and e) the results of 2022 Dakota skipper survey. Many of these areas were presented in the *Summit Carbon Solutions Midwest Carbon Express 2022 Dakota Skipper Study Plan* (WESTECH 2022) which was provided to the Service for review and comment; no comments were received, and both the North Dakota and South Dakota field offices stated that the study plan was acceptable (pers. comm. Charlene Bessken USFWS South Dakota Ecological Services Field Office to John Beaver WESTECH on April 6, 2022; Heidi Riddle USFWS North Dakota Ecological Services Field Office to John Beaver WESTECH on April 21, 2022).

Surveys were led and supervised by biologists Mr. Jim Reiser and Mr. Jameson Reiser. Mr. Jim Reiser possesses a Service recovery permit (Permit number ES66113B) to conduct and directly supervise Dakota skipper surveys and has over 40 years' experience in Lepidoptera survey, including several surveys specifically for Dakota skipper. Mr. Jameson Reiser possesses a Service recovery permit (Permit number ESPER2616267) to conduct and directly supervise Dakota skipper surveys and has over 10 years' experience in Lepidoptera survey, including several surveys specifically for Dakota skipper. Additional qualified biologists who worked under the supervision of the permit holders included: Pete Christensen, Dave Hagen, and Lisa Larsen. Messrs. Christensen and Hagen both have previous experience in completing surveys for Dakota skipper, their habitat, and surveys for other rare Lepidoptera (e.g., Carson wandering skipper (Pseudocopaeodes eunus obscurus) or monarch (Danaus plexippus)), as well as extensive experience in prairie vegetation surveys. Ms. Larsen is a plant ecologist with more than 30 years' field survey experience. Mr. Dan Culwell also participated in surveys and operated the sub-meter GPS units to record survey tracks and to ensure surveys occurred within the appropriate survey corridor and on property where access was granted by the landowner. Finally, three sites were evaluated subsequent to the primary survey as these areas were accessible after the Dakota skipper flight period. Ms. Prah and Mr. Lund, two experienced vegetation ecologists, assessed vegetation and habitat at these sites, all of which were dominated by non-native grasses and forbs and are unsuitable for Dakota skipper.

Surveys to identify Dakota skipper habitat, and potentially complete occupancy surveys for the species where suitable habitat is present, were scheduled for the adult flight period which typically occurs in late June/early July when flowering plants are at the optimal phenological stage (USFWS 2018). In 2023, the first documented Dakota skipper emergence was in Manitoba on June 20, 2023 (pers. comm. Laura Burns Conservation Program Managers to biologists June 20, 2023). Project surveys commenced after this date when plants were readily identifiable and prioritized sites for potential, more intensive occupancy surveys as described in the 2022 Dakota Skipper (Hesperia

dacotae) North Dakota Survey Protocol (USFWS 2022a). As noted above, assessing habitat prior to implementing occupancy surveys is a key criterion of the protocol. To assist in identifying Dakota skipper habitat, all biologists visited Cross Ranch in North Dakota to observe habitat characteristics in an area that supports Dakota skipper. This property is owned by The Nature Conservancy and is approximately 15 miles north of the Project.

WESTECH preliminarily identified 70 areas of potentially suitable habitat along the route in North Dakota and South Dakota, of which 54 areas were surveyed for habitat or occupancy in 2022. Results of the 2022 survey are presented in the *Summit Carbon Solutions 2022 Dakota Skipper (Hesperia dacotae) Survey Report* (SCS 2022a); no Dakota skipper were observed at the sites in 2022 and only two areas of suitable habitat were identified. In 2023, 23 areas of potentially suitable habitat were identified for survey in North Dakota along the route as configured in June 2023; an additional 7 areas of potentially suitable habitat were subsequently identified along the current route. These subsequent areas could not be surveyed in 2023 but are scheduled for survey in 2024. An overview of 2022 and 2023 survey sites in North Dakota is presented in Figure 1.

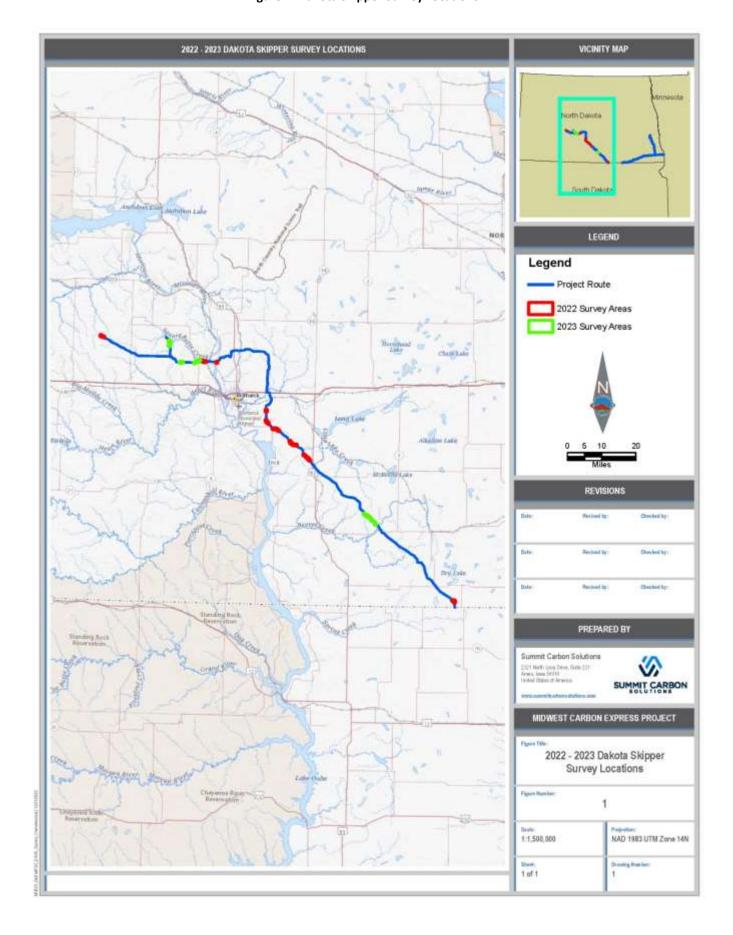
At each survey site in North Dakota where access was allowed, biologists recorded dominant vegetation, recorded all butterfly species observed, photographed the site, and determined if the area was consistent with suitable habitat characteristics for Dakota skipper. In three areas where access was not allowed, biologists could view the habitat from an adjacent parcel(s) and were able to determine the likelihood of whether the site provided suitable habitat. Biologists used several lines of evidence to determine if a site supported suitable habitat for Dakota skipper, including: 1) the description of Dakota skipper habitat provided by the Service in numerous publications (USFWS 2014; 2015; 2018; 2021; 2022a), 2) comparison with the Cross Ranch reference area, and 3) Messrs. Reisers' experience in surveying, and locating, Dakota skipper on previous efforts.

All butterfly species that were observed at a site were identified, if possible, either through capture and safe release, or at a distance. Primary resources for identifying butterflies included a review of specimens previously collected by Mr. Reiser and available on-site, as well as *Kaufman Field Guide to Butterflies of North America* (Kaufman 2006), *National Audubon Society Field Guide to North American Butterflies* (Pyle 1981), *Field Guide to Butterflies of South Dakota* (Marrone 2002), and *Butterflies of North Dakota*: *An Atlas and Guide* (Royer 1988).

### 2.2 Dakota Skipper Occupancy Survey

Unlike 2022 where occupancy surveys were completed at two sites in North Dakota with suitable Dakota skipper habitat, no areas of suitable habitat were identified in 2023 and therefore occupancy survey was not completed per the protocols identified in the 2022 Dakota Skipper (Hesperia dacotae) North Dakota Survey Protocol (USFWS 2022a); however, all butterflies observed at each site were recorded. Further, the two areas with suitable Dakota skipper habitat where occupancy surveys were completed in 2022 are no longer on the Project route in North Dakota. Although these two North Dakota sites were originally identified for repeat survey in 2023, Summit moved the route to avoid these areas of suitable habitat as well as unrelated sensitive resources that were identified on the properties.

**Figure 1: Dakota Skipper Survey Locations** 



#### 2.3 Results

No Dakota skipper were observed at any location in North Dakota. As noted above, most areas were accessible, the three inaccessible areas were visible from an adjacent parcel(s). Appendix B depicts all the North Dakota sites along with each site's habitat suitability and access status, and Appendix C contains field forms for all North Dakota sites where habitat survey was completed and also lists all *Lepidoptera* species that were observed at a site.

In total, 10 sites with access were surveyed during the appropriate survey window. Three sites could not be accessed but were observed from adjacent parcels. Seven additional sites were identified along the current route after the 2023 survey season was completed; these 7 sites are on the reroute around Bismarck.

Approximately 276 acres were surveyed at the 10 sites with access; none of these sites contained suitable habitat for Dakota skipper. Eighty percent of 2023 survey sites were dominated by either smooth brome, Kentucky bluegrass, yellow sweetclover (*Melilotus officianale*), or a combination of the three. Native forbs and grasses were present within some of these sites but not with sufficient diversity or abundance to support Dakota skipper. Only two sites were dominated by native grasses, including sites 111 and 113. Dominant grasses included blue grama (*Bouteloua gracilis*), needle-and-thread, and upland sedges such as threadleaf sedge (*Carex filifolia*). Native perennial forbs were also present at these sites but at relatively low density and either without typical nectar sources, or with only trace amounts of nectar sources. Although these sites were primarily native pastures, Messrs. Reiser nonetheless determined that they were unsuitable for Dakota skipper after walking the areas and identifying butterflies on site. In particular, larval host grasses, such as little bluestem were often lacking in adequate quantities to support Dakota skipper and/or if little bluestem was present at more than a trace cover, there were few nectar sources.

The Cross Ranch in North Dakota is the closest area to the Project with known populations of Dakota skipper and occurs on the west side of the Missouri River approximately 15 miles north of route NDM-106, Milepost 169 near Sanger, North Dakota. To date, none of the surveyed areas on the current route in North Dakota provide suitable habitat for Dakota skipper similar to that on the Cross Ranch. The two areas that had habitat similar to that on the Cross Ranch and that were crossed by the Project in 2022 have now been avoided through re-routes.

An area totaling approximately 48 acres within the Project Environmental Survey Area (ESA) on route NDL-328 near the Minnkota Power Co-op could not be accessed to determine if suitable habitat was present. However, this general area could be viewed from adjacent site 102 where access was allowed and it appeared to be dominated by a similar mix of native and non-native species as occur on site 102. Consequently, the inaccessible area is likely unsuitable for Dakota skipper.

Approximately 197 acres at 7 sites were identified as potentially suitable along the current route after the Dakota skipper survey window had closed. These areas are scheduled for survey in 2024 if access is allowed.

To evaluate the potential for suitable habitat to occur within inaccessible areas, a rating system was developed in 2022 to rank the likelihood of suitable habitat presence and used again in 2023. The following criteria were assessed for suitable habitat on each inaccessible parcel (both the 2023 inaccessible sites and the sites identified after the survey window was closed):

- Suitable habitat present on one side of inaccessible parcel.
- Suitable habitat present on both sides of inaccessible parcel.
- Suitable habitat visible from public road.

- Aerial image indicates potentially suitable habitat in areas that cannot be seen from a public road or adjacent parcel.
- Site is within one mile of potentially suitable habitat (identified either from aerial imagery or survey of proximal parcels).

In each case a value of 1 was assigned for a positive response and a value of 0 was assigned for a response of no data (e.g., a site was not viewed from one side on an adjacent parcel, or a site was not viewed from a public road). In addition, a value of -1 could be assigned to criteria A, B, or C if habitat was determined unsuitable from those vantage points. This method therefore weighted on-the-ground observations from proximal areas more heavily than remote data. For example, if aerial imagery of inaccessible parcels indicated potentially suitable habitat, this score of 1 could be negated or confirmed by an observation from an adjacent parcel or public road. The sum of each criterion was calculated for each site as an indicator of the potential for suitable habitat within the site. An assessment of these scores was given the following ranking:

- Scores ≥ 3: The site likely contains areas of suitable habitat.
- Scores 1 2: The site potentially contains areas of suitable habitat.
- Scores <1: The site likely is unsuitable habitat.

Table 1 summarizes Dakota skipper habitat along the Project within North Dakota by county.

Table 1: Dakota skipper suitable habitat, unsuitable habitat, and likelihood of suitable habitat in North Dakota (2023).

County	Suitable Habitat (Acres)	Unsuitable Habitat (Acres)	Likely Unsuitable (Acres)	Potentially Suitable (Acres)	Total Acres
BURLEIGH	0.0	0.0	0.0	197.0	197.0
EMMONS	0.0	71.2	0.0	0.0	71.2
LOGAN	0.0	5.6	0.0	0.0	5.6
MORTON	0.0	138.6	0.0	0.0	138.6
OLIVER	0.0	60.8	48.5	0.0	109.3
TOTAL NORTH DAKOTA	0.0	276.3	48.5	197.0	521.9

#### 2.4 Summary

Summit has completed survey for Dakota skipper habitat and individuals along the Project in North Dakota in 2022 and 2023. No Dakota skipper were observed in either year. The only known suitable habitat for the species along the route was identified and surveyed in 2022, Project reroutes have now avoided that habitat. No suitable habitat was identified along the route in 2023. Three areas could not be accessed during the survey window but was viewed from an adjacent parcel; based on that assessment, habitat on the inaccessible site is likely unsuitable. Seven areas were identified along the current route after the Dakota skipper survey window had passed. These areas have potentially suitable habitat based on a desktop assessment of aerial imagery although it is unknown if suitable habitat is actually present. Both the inaccessible site and the newly identified sites will be surveyed in 2024 to determine if suitable habitat for Dakota skippers is present. If suitable habitat is present, occupancy surveys will be completed consistent with the Service's protocol (USFWS 2022a).

## 3 Northern Long-Eared Bat Habitat Assessment

WESTECH mapped all wooded areas within an ESA centered on the Project centerline as all of the states that would be crossed by the Project are within the overall range of NLEB. Wooded areas were identified from high-resolution aerial imagery and were defined as any tree, or collection of trees, that were visible within the ESA. This level of mapping resulted in higher-resolution habitat than that obtained from remote sensing data. The ESA size varied depending on the Project workspace but included at least 150-feet either side of the centerline, and often included an area 250-feet either side of the centerline. A total of 239 wooded areas were mapped within the ESA in North Dakota and each was then assessed relative to several habitat components that define the suitability of each wooded area as habitat for NLEB. The general location of these wooded areas is displayed in Figure 2.

The term "wooded area" is not clearly defined by the Service and its use varies in peer-reviewed literature and Service documents. The Service notes that suitable summer habitat for NLEB includes a wide variety of "forested/wooded habitats" where they roost, forage and commute as well as some adjacent, interspersed nonforested habitats such as wetlands, pastures, and agricultural areas (USFWS 2023a). The Service also states, in their 2016 determination that Critical Habitat was not warranted, and that "the species' specific needs and preferences for these habitat elements are relatively flexible, plentiful, and widely distributed" (87 FR 24710).

Although NLEB are flexible in their summer habitat needs, the Service has recently provided guidance on a definition of potentially suitable habitat for NLEB (USFWS 2023b). This guidance includes a broad description of components in suitable summer habitat (e.g., trees > 3 inches diameter at breast height (dbh), typically intact mixed-type forests with small gaps, etc.). The Service also cites three examples of unsuitable habitat, including:

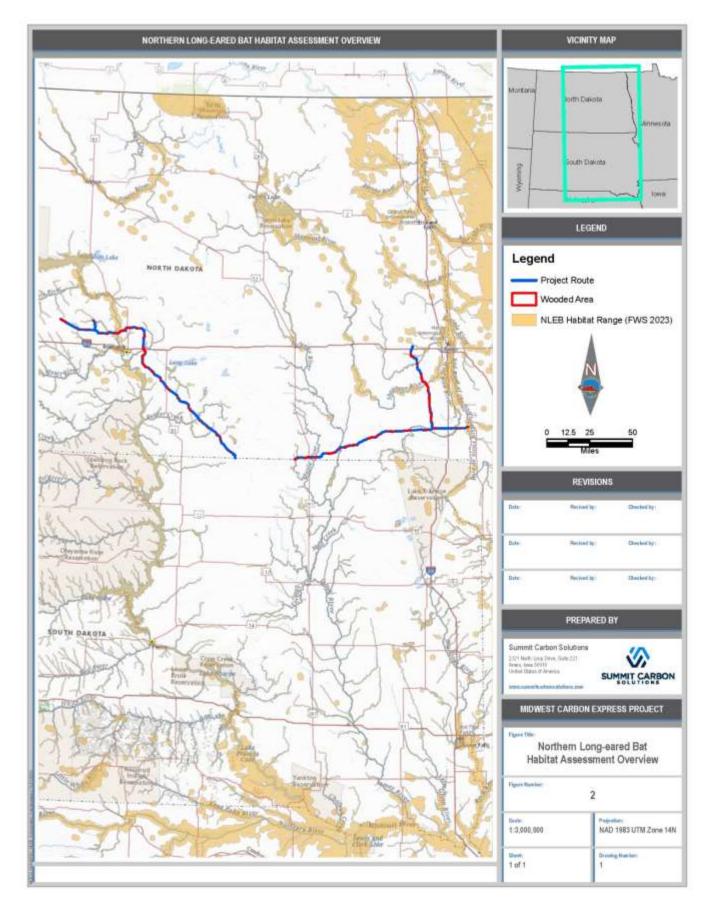
- Individual trees that are greater than 1,000 feet from forested/wooded areas;
- 2. Trees found in highly developed urban areas (e.g., street trees, downtown areas); and
- 3. A pure stand of less than 3-inch dbh trees that are not mixed with larger trees.

Much of the habitat guidance for NLEB is based on guidance the Service previously provided for Indiana bat (*Myotis sodalis*). In particular, the guidance regarding a 1,000-foot distance to forested/wooded areas is based on guidance for Indiana bat which clarifies the likelihood that Indiana bat, and by inference NLEB, would be present in summer foraging and roosting habitat (USFWS 2011). This guidance includes two additional rules for determining likelihood of use based on habitat connectivity or isolation, and states:

"In summary, if both of the following conditions are true, Indiana bat presence [and by inference NLEB] is unlikely within and near the project area during the summer period...

- 1. No suitable foraging or roosting habitat is in the project area or within 1,000 feet of the project area boundary.
- 2. Commuting habitat, if occurs in or within 1,000 feet of the project area boundary, is, more than 1,000 ft, or if connected more than 2.5 miles, from suitable roosting or foraging habitat." (USFWS 2011).

Figure 2: Northern Long-eared Bat Habitat Assessment Overview



Although Indiana bats were documented crossing open areas greater than 3,000 feet in an agricultural landscape (Kniowski 2011), that particular study occurred in a landscape with numerous, connected forested fence rows and interspersed woodlots adjacent to a large riparian system; consequently, the degree of openness in that study was lower than in most agricultural settings on the western perimeter of NLEB range. In contrast, most other research indicates that Indiana bats predominately forage, roost, and travel within wooded habitats or along their edges (USFWS 2011) even when following wooded habitats, rather than crossing large open areas, results in greater flight distance (Murray and Kurta 2004). As a result, the Service states that, "NLEBs stay close to forest and woods – only those non-forested areas within 1000' of forest or woods are presumed suitable for the species" (USFWS 2023c).

Based on these descriptions and guidance, wooded areas crossed by the Project ESA were classified relative to their degree of isolation or connectivity to other wooded areas, as well as the individual stand characteristics. WESTECH reviewed literature on NLEB habitat and used it to identify relevant habitat characteristics that could be evaluated with aerial imagery and field survey habitat notes and data (e.g., forested, cultivated, pasture, etc.). WESTECH also used the Service's recently published and updated range map for NLEB (USFWS 2023c) which is more specific than the previous version. These data were overlain with 2.5 mile and 1,000-foot buffers surrounding wooded areas within the Project ESA consistent with the Service's guidance for determining habitat connectivity and suitability. Each wooded area was then evaluated to determine if it was within, and connected to, the mapped NLEB range at 2.5 miles and 1,000 feet or to unmapped habitat that appeared suitable for foraging and roosting. The Service's updated NLEB range map is shown on Figure 2.

Numerous scientific articles on NLEB indicate that the species prefers intact, closed-canopy forests for foraging, although individuals will forage along the forest edge (Patriquin and Barclay 2003, Jung et al. 1999, Barbour and Davis 1969). The NLEB rarely flies through non-forested areas, particularly large non-forested areas such as agricultural fields (White et al. 2017, Henderson and Broders 2008, Hogberg et al. 2002). Foraging areas typically vary between 46 hectare (ha) and 65 ha (114 acre (ac) and 160 ac) within intact forests (Broders et al. 2006, Owen et al. 2003), but may be as small as 6 ha (14 ac) in fragmented forest and agricultural landscapes (Henderson and Broders 2008). Lausen (2009) suggests that since the NLEB rarely fly in open areas it is not surprising that home ranges are smaller in areas where forest patch size is smaller.

Roosting occurs primarily within intact, closed-canopy, deciduous forests (USFWS 2022c, Broders and Forbes 2004, Menzel et al. 2002, Owen et al. 2002, Foster and Kurta 1999). The NLEB rarely ventures more than a few meters from forested habitat (White et al. 2017), although some individuals may commute between roosting and foraging sites through open landscapes. As noted, the Service has identified 1,000 feet as the approximate boundary beyond which NLEB are unlikely to commute between disconnected wooded areas.

Roost tree species and diameter are highly variable (USFWS 2022c, Lacki and Schwierjohann 2001, Foster and Kurta 1999) although snag density, tree density, and presence of cavities or loose bark do appear to be important roosting features (Menzel et al. 2002, Owen et al. 2002, 2003, Foster and Kurta 1999). In a forest—agricultural landscape, females may exclusively use deciduous species (Foster and Kurta 1999) rather than coniferous species (e.g., eastern red cedar (*Juniperus virginiana*)) such as often occur in planted shelterbelts. Proximity to water has also been identified as an important feature for roosting and foraging (USFWS 2022c, Henderson and Broders 2008, Carter and Feldhamer 2005, Sasse and Perkins 1996). Commuting habitat typically consists of narrow lines of trees,

such as occur in shelterbelts or fencerows, narrow wooded drainages, and wooded tracts that are connected to roosting and foraging habitat (USFWS 2011).

#### 3.1 Northern Long-Eared Bat Habitat Classification

Based on the literature noted above, aerial imagery, and Project vegetation data, WESTECH used the following criteria to assess the quality of NLEB habitat within the ESA, as well as the suitability based on the Service's 2023 guidance (USFWS 2023b).

- A wooded area is within the Project ESA and is within NLEB distribution as defined by the Service's Species
   Status Assessment Report for the Northern long-eared Bat (Myotis septentrionalis) (USFWS 2022c); the
   entire Project ESA is within the Midwest Representation Unit of the NLEB's distribution based on this
   guidance. Note however, that in North Dakota most potentially suitable, or occupied, habitat occurs along
   primary riparian drainages and associated wooded habitat (USFWS 2023b, Figure 1; USFWS 2022c, Figure
   3.3).
- 2. Wooded areas that met any of the following three criterion were classified as Unsuitable Habitat:
  - Individual trees that are greater than 1,000 feet from forested/wooded areas;
  - Trees found in highly developed urban areas (e.g., street trees, downtown areas); and
  - A pure stand of less than 3-inch dbh trees that are not mixed with larger trees (USFWS 2023b).
- 3. If wooded areas did not qualify as Unsuitable, they were then classified according to one or more of the following four descriptive habitat components:
  - **a.** <u>Stand Size</u>: The wooded area is part of a stand that is at least 6 ha (14 ac) (Henderson and Broders 2008). Note that this is the smaller stand size found to support NLEB based on a study of fragmented forested and agricultural landscapes and is therefore a conservative estimate of stand size relative to NLEB use.
  - **b.** Tree Canopy Cover: The wooded area contains a relatively closed canopy (e.g., at least 50 percent canopy closure) (Sasse and Pekins 1996). Note that this is a minimum; the average forest canopy cover in this study was 78 percent. Given that the Project occurs in a more fragmented agricultural landscape than where these surveys were conducted, and that the Project is in the Great Plains and Midwest where tree density is often lower, an estimated value of 50 percent canopy closure was used as a conservative indicator of closed canopy.
  - c. Tree Structure: Snags and trees with exfoliating bark, deeply furrowed bark, cavities, and crevices may be present (Lacki and Schwierjohann 2001, Carter and Feldhamer 2005, Lacki et al. 2009, Park 2010). Since there are no Project data on tree size or condition, the presence of these features was classified relative to estimated woodland structure based on aerial imagery. Stands classified as Large or Moderate Tree Structure are assumed to provide these features, while stands classified as Small Tree Structure are assumed to have a low likelihood of providing these features.

d. Proximity to Water: The wooded area is proximal to a waterbody, stream, river, pond, or reservoir (Sasse and Perkins 1996, Carter and Feldhamer 2005, Henderson and Broders 2008). One study found that during the driest months water was within 750 m (492 ft) of a roost (Carter and Feldhamer 2005). Since water may or may not be present in a drainage or pond depending on precipitation it was assumed that if a wooded area occurred within 750 m of a drainage, stream, or river, or if a pond (even dry) was visible on aerial imagery within 750 m of the wooded area, then the site was proximal to water.

These habitat components were evaluated for each wooded area to estimate habitat quality for NLEB (Table 2). Note that Table 2 describes the estimated quality of habitat that a wooded area provides for NLEB, not the likelihood of actual NLEB presence.

Habitat Components	Habitat Quality	Habitat Description and Example
Wooded area > 6 ha (14 ac). > 50% tree cover Large or mixed structure trees, and Water within 750 m (492 ft).	High	Larger, wooded areas typically along streams and rivers, or larger wooded areas connected along upland draws and valleys; e.g., the Platte River riparian corridor.
Three of the four habitat components noted above.	Moderate	Variably sized wooded areas typically with closed canopy, mixed or large tree structure, and often proximal to water; e.g., scattered woodlands in hilly pastures or cultivated areas.
Two of the four habitat components noted above.	Low	Small, wooded areas of variable canopy cover that occur as narrow stands or small pockets of trees, occasionally near water; e.g., larger shelterbelts.
Zero or one of the four habitat components noted above.	Very Low	Very small, wooded areas or small groups of individual trees not near water; e.g., narrow shelterbelts or woodlots around farm houses in a highly fragmented, cultivated landscape.

Table 2. Northern Long-Eared Bat Habitat Quality Description

#### 3.2 Northern Long-Eared Bat Habitat Connection

Subsequent to this assessment of habitat quality, each wooded area was evaluated relative to its connection to, or isolation from, other wooded areas and the Service's mapped NLEB range. This assessment of habitat connection was completed according to the Service's guidance, and its supporting literature, for determining whether potentially suitable habitat was isolated and therefore unlikely to actually be available (i.e., suitable) for NLEB. Isolated habitat was identified according to the Service's guidance (USFWS 2023a) as referenced for Indiana bat and utilized for NLEB as follows:

- 1. "No suitable foraging or roosting habitat is in the project area or within 1,000 feet of the project area boundary.
- 2. Commuting habitat, if occurs in or within 1,000 feet of the project area boundary, is more than 1,000 ft, or if connected more than 2.5 miles, from suitable roosting or foraging habitat". (USFWS 2011).

Wooded areas that do not meet these criteria and are not isolated were classified as Suitable Habitat.

In a fragmented agricultural landscape such as occurs throughout most of the Project area, almost all of the suitable, and/or occupied habitat occurs within approximately 1,000 feet of wooded riparian or forested corridors and associated tributaries and woodlots (USFWS 2023b, USFWS 2022c, NDGF 2015, SDGF 2023, MDNR 2023, Kaminski et al. 2020). At a landscape scale relative to NLEB habitat, the numerous small, wooded areas around farm residences and shelterbelts on the Project are often not connected to more contiguous wooded areas that could provide suitable foraging or roosting habitat consistent with the two criteria noted above. Consequently, small, wooded areas that occur in monoculture agricultural landscapes are often isolated at a landscape level from suitable roosting and foraging habitat even if some wooded areas are within 1,000 feet of each other or connected by commuting habitat.

In order to evaluate these criteria in the agricultural landscape along the Project, these small, wooded areas and shelterbelts were examined according to: 1) their connection with other wooded areas within 1,000 feet or the Service's mapped NLEB range (USFWS 2023d), and 2) if those proximal wooded areas were ultimately within 1,000 feet of suitable roosting or foraging habitat or the Service's mapped NLEB range (USFWS 2023d). This process was continued out to 2.5 miles from the Project footprint per the Service's guidance (USFWS 2023b, USFWS 2011).

Frequently, small, wooded areas and shelterbelts within the Project ESA are not connected to suitable roosting and foraging habitat because they are separated by more than 1,000 ft, or if they are connected to small, fragmented wooded areas within 1,000 ft, those proximal areas are then isolated by more than 1,000 feet to suitable habitat. On many portions of the route, particularly in North Dakota, wooded areas exist as scattered stands around farm residences that may be within 1,000 feet of another farm tree stand or shelterbelt, but that are ultimately unconnected to suitable roosting and foraging habitat within 2.5 miles. In several cases, there is no suitable roosting and foraging habitat within 2.5 miles of the Project wooded area, a result that is also confirmed by the Service's updated NLEB range map which shows large areas that are outside the species' range due to cultivation and a lack of trees. These types of wooded areas were classified as Isolated Habitat indicating that while stand size, canopy cover, tree structure, and/or proximity to water might satisfy physical habitat requirements for NLEB, these sites are too removed from suitable roosting and foraging habitat, often at a landscape level, to qualify as Suitable Habitat themselves.

#### 3.3 Results

Appendix D lists each of the wooded areas within the Project ESA in North Dakota and classifies each according to the four habitat components noted above, whether commuting habitat is within 1,000 feet of a wooded area on the Project, whether suitable roosting and foraging habitat is within 2.5 miles of a wooded area on the Project, and whether those habitats are connected. Each wooded area is then classified as either Suitable Habitat, Unsuitable Habitat, or Isolated Habitat. Appendix E portrays each of these wooded areas on aerial imagery coded according to their assigned habitat components and suitability.

Overall, most wooded areas within the ESA in North Dakota occur as small, isolated shelterbelts or woodlots surrounding farm residences, there are few areas of Suitable habitat on the Project in North Dakota. Table 3 summarizes the approximate acreage of wooded areas by suitability and habitat quality within the ESA in each county.

State	Habitat				
	Quality	Suitable	Unsuitable	Isolated	<b>Grand Total</b>
North	High	31.2	0.0	0.0	31.2
Dakota	Moderate	16.9	0.3	19.7	36.9
	Low	45.4	17.0	58.9	121.3
	Very Low	4.7	27.3	38.1	70.2
<b>Grand Total</b>		98.1	44.5	116.8	259.4

Table 3. Northern Long-Eared Bat Habitat Assessment for North Dakota: Environmental Study Area

The general lack of NLEB habitat along the Project is not surprising given its location within a highly fragmented agricultural landscape. Some researchers speculate that NLEB is a recent occupant of midwestern plains states due to the relatively recent expansion of forests into areas that were formerly tallgrass prairie but that have become dominated by trees with the exclusion of fire in areas that cannot be farmed (White et al. 2017). In this type of landscape, wooded areas adjacent to cropland and pastures more closely resemble a "shredded habitat" rather than a series of isolated, blocky habitat islands as occur where extensive forests have been removed by logging (White et al. 2017). As a result, NLEB use is primarily restricted to those wooded areas that occur as larger habitat aligned on valleys, creeks, and rivers, and proximal wooded areas (typically within 1,000 feet) that could serve as roost sites (USFWS 2023b, USWFS 2022c, White et al. 2017, Henderson and Broders 2008, Henderson et al. 2008). The Action Area depicted in the Service's Determination Key (USFWS 2023b), the distribution of documented acoustic calls, captures, and hibernacula (USFWS 2022c), and the Service's revised NLEB range map (USFWS 2023d) confirm that NLEB are rarely observed outside of contiguous wooded habitat, or wooded areas that are connected with commuting habitat within 1,000 feet of those areas. Most of this type of habitat on the Project in North Dakota occurs along the Sheyenne River or the Missouri River.

While Table 3 summarizes habitat suitability and quality within the Project ESA in North Dakota. Table 4 summarizes estimated impacts to habitat within the Project construction footprint in North Dakota. Permanent impacts are those associated with the permanent right-of-way easement, these areas are periodically cleared on a maintenance schedule to allow for aerial pipeline inspection consistent with federal safety inspection requirements. Trees are not allowed to re-grow within the permanent easement to a size that could be used by NLEB. Temporary impacts are those associated with construction in the temporary right-of-way easement, including small adjacent impacts at temporary workspaces such as road or stream crossings. Trees are allowed to re-grow within the temporary easement to a size that could be used by NLEB. Finally, Table 5 summarizes acres of NLEB habitat that have been avoided by trenchless crossings of rivers and streams (e.g., horizontal directional drill (HDD) crossings or bore crossings). Note that Table 4 already accounts for the avoidance impacts in Table 5.

Approximately 53 percent of impacts in Suitable Habitat would be temporary (8.4 acres; Table 4); trees cleared in these areas would be allowed to re-grow to a size that could be used by NLEB. About 47 percent of impacts in Suitable Habitat would be permanent (7.4 acres; Table 4); trees would not be allowed to re-grow to a size that could be used by NLEB in these areas. Overall, 63 percent of permanent impacts would occur in areas with

Unsuitable Habitat or Isolated Habitat (e.g., stands < 3 inches dbh or fragmented tree stands often in isolated shelterbelts).

Although permanent impacts would occur in areas with a Suitable Habitat for NLEB, those impacts would be greater without avoidance measures implemented at stream and river crossings. Trenchless crossings at these sites would avoid impacts to approximately 5.2 acres of Suitable Habitat; consequently, 41 percent of permanent impacts in Suitable Habitat would be avoided (Table 5).

Table 4. Northern Long-Eared Bat Habitat Impact Assessment in North Dakota

Northern Long-Eared Bat Habitat	Impact Type	North Dakota
Suitable	Permanent	7.4
	Temporary	8.4
	Total Suitable	15.8
Unsuitable	Permanent	3.6
	Temporary	8.0
	Total Unsuitable	11.7
Isolated`	Permanent	8.8
	Temporary	7.9
	Total Isolated	16.6
	Grand Total	44.0

Table 5. Northern Long-Eared Bat Habitat Avoidance Assessment in North Dakota

Northern Long-Eared Bat Habitat	North Dakota
Suitable	5.2
% Permanent Impact Avoidance	41.5%
Unsuitable	0.1
% Permanent Impact Avoidance	1.4%
Isolated	0.9
% Permanent Impact Avoidance	8.9%
Grand Total	6.1

The Service evaluates impacts to NLEB through a variety of metrics in its Determination Key (USFWS 2023b). These metrics include the timing of tree removal (e.g., during the maternal roosting season or not), an analysis of the acreage of trees removed in stand, the amount of separation between stands created by tree removal, and the proximity of tree removal to hibernacula.

The Project intends to remove trees outside of the maternal roosting season (i.e., April 1 – July 15) for North Dakota. There are no known hibernacula within 5 miles of any Project component in North Dakota (informal consultation January 25, 2022). The Project would not remove more than 10 acres of trees at any site or within any stand. The largest area of tree removal in North Dakota would be approximately 1.4 acres on the north bank of the Sheyenne River. The surrounding area within 3 miles of the Project at the Sheyenne River includes more than 3,000 acres of Suitable habitat; consequently, removal of approximately 1.4 acres on the north bank would equate to less than 1 percent of Suitable habitat in the surrounding area. Finally, no wooded area would be separated by more than 1,000 feet due to tree removal. The Project footprint typically varies from 100 to 200 feet wide and no connecting habitat of 1,000 feet between areas of Suitable habitat would be removed.

### 3.4 Summary

The proposed MCE Project would traverse areas in North Dakota with various types of habitat for NLEB. This report documents the results of a desktop habitat assessment for NLEB and is intended to assess the quality and type of habitat that a wooded area within the Project ESA and footprint in North Dakota could provide for NLEB.

The Project in North Dakota occurs in a highly fragmented landscape with limited wooded areas. Most of the wooded areas that do occur within the Project ESA are comprised of small, isolated stands surrounded by large areas of cultivation; it is unlikely that these types of isolated wooded areas provide habitat for NLEB. Almost all wooded areas with Suitable Habitat for NLEB are located along creeks, rivers, wooded valleys, and associated tributaries; however, it is unknown if NLEB are actually present at these sites and the Service notes that based on the best available science, most Suitable Habitat is now expected to be unoccupied (USFWS 2023e).

Approximately half of impacts in Suitable Habitat would be temporary and trees would be allowed to re-grow to a size that could be used by NLEB. The remaining half of impacts in Suitable Habitat would be permanent and trees would not be allowed to re-grow to a size that could be used by NLEB due to federal safety regulations that require periodic right-of-way clearing to allow for aerial inspection. This clearing would only occur within the permanent easement portion of the Project footprint. Avoidance measures (i.e., trenchless river crossings) would avoid about 41 percent of impacts in Suitable habitat in North Dakota that would otherwise occur. The largest area of Suitable habitat that would be affected (1.4 acres) is on the north side of the Sheyenne River, impacts in this area are less than 1 percent of Suitable habitat in the surrounding area.

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Appendix A – 2022 Dakota Skipper (*Hesperia dacotae*) North Dakota Survey Protocol

# 2022 Dakota Skipper (*Hesperia dacotae*) North Dakota Survey Protocol



Photo credit: Jerry Reinisch



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## 2022 Dakota Skipper Survey Protocol

Assessing Sites for Dakota Skipper Presence in North Dakota

## **Background & Purpose**

This protocol is offered as a recommended approach when conducting occupancy surveys on grasslands in North Dakota where and when the objective is to detect the presence of the Dakota skipper (*Hesperia dacotae*) at the site scale. This protocol is designed to address the species' likelihood and level of occupancy at the site scale when and where little or no pre-existing information is available to determine if the species is present. This protocol may be used in other states if agreed to by Ecological Services field office personnel in those states.

This protocol can be used for surveys for which the primary objective is to monitor the species' abundance or population status and trend over extended timeframes or large spatial scales. The current range map for Dakota skipper is included in Appendix A.

This document provides the user with information to decide where surveys for the Dakota skipper may be warranted; standardized 'ground rules' to help ensure that survey methods are repeatable and results will be as reliable as possible; and outlines how to report survey data to the FWS. The reliability of survey results for Dakota skippers depends on several factors, including: the abilities and expertise of observers; survey timing relative to the species' flight period; time of day and weather conditions; and, the species' density. The species' flight period varies somewhat from year to year depending on annual variations in weather (Dearborn and Westwood 2014, entire).

For additional information on Dakota skipper ecology and threats to its continued existence contact the U.S. Fish and Wildlife Service North Dakota Ecological Services Field Office (NDFO) or visit the following website:

http://ecos.fws.gov/ecp/species/1028

## Historical and Current Dakota Skipper Distribution in North Dakota

The Dakota skipper inhabits grassland habitat in north-central United States and southern Canada. In the United States, the species occurs in portions of Minnesota, North Dakota, and South Dakota. The species is currently presumed to be absent from Illinois, Iowa, and eastern Minnesota (79 FR 63672:63667).

The 2022 Township Map (Appendix A) depicts observations of the Dakota skipper at the township level in North Dakota where the species has occurred historically within the last 30 years (McCabe 1981, p. 179-193).

## Making a Decision to Conduct an Occupancy Survey

Site Assessments and Delineating the Survey Areas

To determine whether surveys for Dakota skippers are warranted, we recommend first delineating the area that may be affected (directly or indirectly), by the proposed or ongoing action referred to as the action area. The action area should be entered into IPAC to determine if DASK could be associated with the area, the second step would be to assess whether Dakota skipper suitable habitat is present. We recommend contacting the NDFO for assistance for survey decisions <sup>2</sup>. By comparing the IPAC analysis to the current township occurrence and DASK range map occupancy surveys can be justified.

Determining if Dakota skipper habitat is present requires an assessment of the vegetation. Sites containing native prairie grassland and having features indicative of Dakota skipper habitat, described on pages 7-9 of this document, may harbor the species<sup>3</sup>. Dakota skippers are not likely to be present in cropped areas, previously cropped areas, non-native haylands, pasture or other grassland that is dominated by non-native species, or in areas where trees or shrubs predominate. The species occurs in some grazed lands that are dominated by native prairie vegetation.

Dakota skipper habitat often occurs in a patchy mosaic pattern on the landscape due to underlying site characteristics, prior land management, and other factors. Occupancy surveys are conducted during the flight period and are performed within the patches that contain features and conditions typical of Dakota skipper habitat. Surveys should encompass a 250 meter buffer to adjacent habitat when nectar sources are present, in bloom, and in close proximity to other suitable habitat. The habitat patches should be mapped (location and size) in order to evaluate the landscape habitat connectivity.

The proximity of habitat patches informs how a site of interest may play a role in the species viability in a given landscape, in regards to reproduction, movement and persistence (Haddad 1999, entire). The detection rate for the species has not been modeled under differing densities (due to habitat, weather, or population factors), so the only means of reducing the risk of incorrectly concluding the species is not present, when it actually is present is to increase survey effort. For this reason, we recommend surveys be conducted for a minimum of two consecutive seasons (flight periods).

<sup>&</sup>lt;sup>1</sup> Action area is defined as all areas that may be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. It encompasses the geographic extent of environmental changes (i.e., the physical, chemical and biotic effects) that will result directly and indirectly from the action. The action area may be up to 1 km (0.6 mi) larger than the area

<sup>&</sup>lt;sup>2</sup> There remains a potential that the species may currently reside in some counties listed as 'presumably absent' due to the incomplete nature of past survey efforts. An IPAC search would assist with determining presence.

<sup>&</sup>lt;sup>3</sup> For a more detailed description of typical Dakota skipper habitat features, see 79 FR 63672:63674-63675.

Alternatively, if it is not practicable to complete two seasons of surveys, the survey effort within one season of surveys should be increased by surveying all suitable Dakota skipper habitat and recording total number of DASK out to a minimum of 250 m (820 ft) from the site of interest. In the special case when the site of interest is within 1 km (0.6 mi) of an established population of Dakota skippers, we recommend the buffer distance be increased to 500 m (0.3 mi) due to the importance of knowing the precise distribution of occurrence of the species in these areas.

If the action area is included in an area designated by the National Weather Service as being in an extreme or exceptional drought status, two years of occupancy surveys are required to establish the status of the Dakota skipper. This drought status is updated by the National Weather Service weekly on the Drought Monitor Map.

In some cases, occupancy survey results from prior years may be available for the site, section, or township of interest. This may be used to inform the likelihood of occupancy at the site. For example, if there is a known location where the species has been documented within 1 km (0.6 mi) of the site of interest, and there is sufficient connectivity between the two sites, occupancy may be assumed by consulting with the Service. In other instances, there may be three or more years of pre-existing surveys at a site that resulted in no detections of Dakota skippers, which may be sufficient to conclude the species is not present. We recommend that you coordinate with the NDFO to ensure survey results being being considered are reliable with regard to the Dakota skipper's status at a site.

Persons with sufficient expertise in prairie ecology, Dakota skipper ecology, or both should preview sites before the flight period to delineate survey areas. Pre-survey reconnaissance of action area and 250 meter buffer could facilitate efficient use of limited surveyor time by delineating habitat patches that should be surveyed during the flight period. In some cases, occupancy surveys may be limited to those habitat patches directly affected by the footprint of the action.

#### **Minimum Qualifications for Surveyors**

Dakota skippers are not readily identified in the field without specialized training and experience. Therefore, agencies and others who want to determine whether or not the species is present in an area must secure the assistance of individuals who are qualified to carry out scientifically credible surveys and who are permitted by the USFWS to complete these surveys.

The Service assesses the qualifications of individuals pursuant to the following criteria:

1. Demonstrated ability to complete surveys for Dakota skippers or similar species and prepare technical reports to convey results along with working with a permitted surveyor for one season (able to obtain reference from the permitted surveyor); and,

2. Previous experience surveying and identifying Dakota skippers. Exceptions may be made for persons with prior experience with similar species and/or extensive experience with other butterfly species – e.g., extensive experience conducting surveys for other rare butterfly species.

Persons who may attempt to capture Dakota skippers during surveys need to obtain a permit from the Service (see, https://fwsepermits.servicenowservices.com/fws). A list of persons who have obtained such permits and who have agreed to allow the Service to release their contact information may be obtained from the NDFO. To obtain a permit please contact theService's Endangered Species Permit Coordinators in the Midwest and Mountain-Prairie regional offices or download the permit application form at https://fwsepermits.servicenowservices.com/.

### **Survey Ground Rules**

FWS recommends that surveys adhere to the following 'ground rules' to ensure that results will be be be useful for determining whether Dakota skippers may be present in the survey area. For project action areas of greater than 10 acres the Service recommends the use of more than one permitted surveyor whenever possible. Time expended during a survey effort should be recorded and included in the annual report (See Additional Recommendations Section for suggested rates).

### Timing & Number of Surveys

The initiation date for surveys is a critical component of data reliability for the Dakota skipper. Multiple surveys (minimum of three (3) during the flight period) are necessary to determine the species' likelihood of occurrence at a site because the species is exceptionally difficult to detect because the species often occurs at low density and it is difficult to identify. The start of the flight period varies considerably among years (Rigney 2013, p. 138; Dearborn and Westwood 2014, entire), but typically begins in mid to late June in North Dakota. The flight period occurs one time period per year and may last 13-19 days or less at any given site (e.g., Rigney 2013, p. 138). Recent information related to emergence in North and South Dakota (Skadson 2018, pers. comm.) place the flight period sometime between June 12<sup>th</sup> to July 15<sup>th</sup>.

- To ensure that surveys are initiated at the proper time (encompassing the peak of the flight period) requires documentation of the following:
  - o emergence at one or more reference sites in North Dakota<sup>3</sup>, where the species occurs on an annual basis, and
  - the flowering plants within the action area are at the optimum phenological stage (see the section entitled *Phenological Indicators*)
     In all survey areas for Dakota skipper the entire action area and 250 m buffer should be surveyed. Total numbers of DASK observed would be recorded for each survey and
  - o three (3) survey days have been completed of the action area and buffer during the  $peak^4$  of the flightperiod; or
  - at least two (2) surveys of the entire action area and buffers have been conducted during the peakflight period over a two consecutive year period (this option is available in cases where prolonged unfavorable weather conditions may preclude three surveys at a location during the flightperiod).

If the action area is included in an area designated by the National Weather Service as being in an extreme or exceptional drought status, two years of occupancy surveys are required to establish the status of the Dakota skipper. This drought status is updated by the National Weather Service weekly on the Drought Monitor Map.

### Surveys:

- o should be conducted between 1000 and 1730 hours (10:00 am 5:30 pm); times can be adjusted to particular time zones where the surveys occur and by individual surveyor's preference based on experience..
- o should never be conducted during periods of fog, drizzle, or rain;
- o are recommended to be conducted only during periods of sustained or gusting winds that average *less than* 30 km/hr (19 mi/hr) measured during a 30 second period, at a height of 1.2-1.8 m (4-6 ft) above ground level (*corresponding to a Beaufort Scale of 4 or less*);
- o are recommended to be conducted when temperature in the shade at ground level is less than 21° C (70° F) and the cloud cover is less than 50 percent, or less than 30° C (86° F) when cloud cover is 50 percent or more..
- Survey transect coordinates are available from NDFO for verifying Dakota skipper flight dates for permitted surveyors (included coordinates and access procedures). Be sure to contact agencies or land owners and obtaining any necessary permits prior to conducting surveys.
- The three (3) surveys during one flight period should be separated by 48 hrs unless doing so would result in subsequent surveys occurring past the *peak* of the flight period. This recommendation to conduct field surveys on separate days is intended to increase the likelihood of detection. Given the short duration of the Dakota skipper flight period, surveys will not be rejected when they are not separated by 48hrs *if* justification is given, and, surveys are conducted under optimal weather conditions.

#### Phenological Indicators

Documentation of the phenological indicators is typically the most important consideration when deciding the date to initiate the first survey of the flight period. Phenological indicators also can aid a retrospective assessment of whether a previous survey for Dakota skipper was appropriately timed. There are two types of phenological indicators to consider: the emergence of other butterflies and the availability/abundance of nectar sources.

The phenological progression of adult butterfly emergence in a Manitoba, Canada study area occurred as follows: European skipper (*Thymelicus lineola*), long dash (*Polites mystic*), tawnyedged skipper (*P. themistocles*), Peck's skipper (*P. peckius*), Dakota Skipper, silver-spotted skipper (*Epargyreus clarus*) and dun skipper (*Euphyes vestris*; Rigney 2013, p. 14). Peck's

<sup>&</sup>lt;sup>3</sup> Select the reference sites that are nearest to the site in question;

<sup>&</sup>lt;sup>4</sup> The likelihood of detecting Dakota skippers is low during the early and late stages of the 13-19-day flight period and may be highest during an approximately five-day period when the male flight overlaps with the peak of the female flight (Rigney 2013, p. 140).

skipper, which is similar in appearance to Dakota skipper, emerged "immediately before and at the same time as Dakota Skipper" and that dun skipper emerged "near the end of the Dakota Skipper flight period" (Rigney 2013, p. 141). Notably, the peak flight period for the wood nymph (*Cercyonis pegala*), a conspicuous species in many Dakota skipper habitats, corresponded to the emergence of Dakota skippers (Rigney 2013, p. 141). Thus, life history of other butterfly species can be very useful towards informing the timing of the peak flight period for Dakota skippers.

Plant phenology is also a reliable means to establish the timing of Dakota skipper surveys. The abundance and diversity of flowering plants should be used to better understand the preferred nectar sources of butterflies. Therefore, dominant floristic data should be reported as part of the data collection for each survey. The form included in the survey protocol can be used as an example (Appendix B).

In North Dakota, Dakota skippers are found in the following two general habitat types:

## 1. Type A Habitat

The first type is a low-lying, wet-mesic prairie with little topographic relief that occurs on near-shore glacial lake deposits. Royer et al. (2008, p. 14-16) referred to this as Type A Dakota skipper habitat.

Although Type A habitats vary throughout the growing season (Rigney 2013), during Dakota skipper's flight period, three plant species are almost always present and blooming: prairie lily (*Lilium philadelphicum*), bluebell bellflower (*Campanula rotundifolia*), and mountain deathcamas (smooth camas; *Zigadenus elegans*) - the latter appears to be an especially strong indicator of Dakota skipper Type A habitat in North Dakota (McCabe 1981, p. 190; Royer et al. 2014, p. 1).

Later in the season, common forbs in bloom in Type A habitat include Rocky Mountain blazing star (*Liatris ligulistylis*), Canada goldenrod (*Solidago canadensis*), strict blue-eyed grass (*Sisyrinchium montanum*), common goldstar (yellow star grass; *Hypoxis hirsuta*), and blackeyed Susan (Lenz 1999, p. 6). Type A habitats also contain small patches of dry-mesic prairie inhabited by Dakota skippers. Stiff sunflower (*Helianthus pauciflorus Nutt. ssp. pauciflorus*) and candle anemone (*Anemone cylindrica*) are typical in these dry-mesic habitats; purple coneflower (*Echinacea angustifolia*), an indicator of Type B habitats (see below) may be present, but is rare in these dry-mesic 'inclusions' (Lenz 1999, p. 6-11).

Plants that are important as nectar sources for Dakota skipper 'Type A' habitats appear to vary geographically, but blackeyed Susan (*Rudbeckia hirta L. var. pulcherrima*) is significant throughout the range of this habitat type. Habitat conservation value for Dakota skippers may be greater at sites where the presence of a variety of species that serve as nectar sources occurs because plant species likely vary in their energetic value or availability during the adult flight period (Dana 1991, p. 48).

Big bluestem (Andropogon gerardii) and little bluestem (Andropogon scoparius) are typically the dominant grasses in North Dakota 'Type A' habitats and indiangrass

(Sorhastrum nutans) may also be present (Royer et al. 2014, p. 1). Dakota skipper adults are typically encountered in "pre-floral stands" of these grass species where they are associated with the forb species described above (Royer et al.2014, p. 1).

## 2. Type B Habitat

Dakota skipper Type B habitat (Royer et al. 2008, p. 14), typically supports a high diversity and abundance of native forbs, including purple coneflower, purple prairie clover (Dalea purpurea), white prairie clover (D. candida), yellow sundrops (Calylophus serrulatus), lambstongue groundsel (Senecio integerrimus), groundplum milkvetch (Astragalus crassicarpus), eastern pasqueflower (Pulsatilla patens), old man's whiskers (prairie smoke, Geum triflorum), western silver aster (Symphyotrichum sericeum), dotted blazingstar (Liatris punctata), tall blazing star (L. aspera), meadow zizia (heartleaf golden alexanders; Zizia aptera), blanket flower (Gaillardia sp.), prairie sagewort (Artemisia frigida), and leadplant (Amorpha canescens) (Skadsen 2006, p. 1-2). Prairie milkvetch (Astragalus laxmannii Jacq. var. robustior) also occurs in 'Type B' habitats in Minnesota(Dana 1997, p. 8).

In the rolling terrain of river valleys and the Missouri Coteau of North Dakota, on the western edge of the species' known range, Dakota skippers inhabit a variant of 'Type B' habitats (Fig. 5). These habitats typically contain an association of little bluestem, big bluestem, and needlegrasses that is often invaded by Kentucky bluegrass (*Poa pratensis*) (Royer and Marrone 1992, p. 22). These prairies, also typically contain prairie lily, bluebell bellflower, coneflowers, and other asters as nectar sources; in some areas, mountain death camas also occurs (Royer and Marrone 1992, p. 22).

Type B habitat (Royer *et al.* 2008, p. 14), occurs primarily on rolling terrain over gravelly glacial moraine deposits and is dominated by big bluestem, little bluestem, and needle or porcupine grasses (*Hesperostipa spp.*) (Fig. 4). As in 'Type A' habitats, bluebell bellflower and prairie lily are present in 'Type B' habitats, but they support more extensive stands of purple coneflower, upright prairie coneflower (*Ratibida columnifera*), and common gaillardia (blanketflower; *Gaillardia aristata*) (Royer et al. 2014, p. 1-2). Each of these is a documented nectar source for the Dakota skipper in 'Type B' habitats (McCabe 1981; Dana 1991).

Little bluestem and porcupine grass (Hesperostipa spartea) are the predominant grass species in South Dakota 'Type B' habitats, but side oats grama, needle-and-thread grass (H. comata), and prairie dropseed are also typical (Skadsen 2006, p. 1-2). In a variant of 'Type B' habitats found in western North Dakota (Fig. 5), western wheatgrass (Pascopyrum smithii) is also typical (Royer et al. 2014, entire).

Survey Routes and Survey Area

#### Data to Collect

- Record the location (GPS coordinates and projection); time of day; and the plant upon which the individual was observed (if applicable). A shapefile of positive occurrence locations should be included in the annual report.
- Record the numbers of other butterfly species observed in each survey area. Data regarding the identity and numbers of other butterfly species present during surveys should be collected because it may be useful in evaluating survey results. Rigney (2013, p. 142), for example, indicated that the ratio of Dakota skippers to long dash, tawny-edged skippers, Peck's skippers, and European skipper may be indicative of habitat quality for Dakota skipper.
- Record the route surveyed (GPS track log), number of surveyors, weather conditions (temperature, cloud cover, and wind speed), and observations about habitat conditions, threats, or management pre- and post-survey. To the extent feasible, record the sex and condition of eachDakota skipper observed. The track logs of each survey completed (positive or negative) should be included as a shapefile in the annual report to the NDFO.
- Handling affects the behavior of some butterflies after their release (Mallet et al. 1987, p. 328). Therefore, we are seeking information with respect to the post-release behavior of any Dakota skippers that are captured and released. The behavior of each captured and released butterfly will be noted and reported annually as follows:
  - Flew to and perched on herbaceous vegetation, low shrubs, or to out-of-sight location in herbaceous vegetation (e.g., into plant litter or duff layer or into bases of grasses);
  - o Flew into tall shrubs or trees and out-of-sight;
  - o Flew away did not see butterfly perch or fly into vegetation; or,
  - Post-release behavior unknown
- If the survey is conducted under the authority of an ESA section 10(a)1(a) permit issued by the Service for work in North Dakota, the surveyor must meet any additional requirements for collection and reporting per the conditions specified in the permit.

#### Additional Recommendations

- Surveys should be conducted by qualified surveyors walking along routes through the survey area (patches). Survey routes can cover up to 5 m (16.4 ft) meters on each side of the observer. Establish enough routes to ensure that the survey will cover all of the survey area. If a Dakota skipper sighting has been confirmed, an additional survey should be completed to quantify the extent of occupancy of the action area and buffer.
- Conduct surveys at an average rate of 1-3 ha/hr (2-7 ac/hr, based on the 35 meters/minute survey pace and the assumption that five meters are effectively surveyed on either side of the observer, as reported by Royer and Royer (2012). Survey rates may be adjusted according to butterfly activity and surveyor's experience level.

- Survey routes should be roughly parallel to each other, spaced approximately 10 m (32.8 ft) apart, and within 5 m (16.4 ft) of the survey area boundary to ensure complete coverage of the habitat within the entire action area and buffer.
- Do not conduct Dakota skipper surveys concurrently with any other focused survey, such as plant surveys, bird surveys, etc.
- Adjustments to the survey area boundaries may be made during the survey if areas that do not contain Dakota skipper habitat are encountered. Areas of no habitat should be mapped and described in the final survey report.

## **Identification of Dakota Skippers**

- Positive identification of Dakota skippers may be confirmed by capture (netting) and release, close-up (perched) examination, or photo-documentation.
- Persons not qualified to conduct typical surveys for Dakota skipper may attempt to document the species' presence with photography. Surveys sufficient to support a presumption of absence, however, should follow the netting and release protocol.
- To ensure that species identity may be confirmed, multiple photos should be taken from both the dorsal and ventral perspective (Rigney 2013, p. 141). Negative surveys conducted by persons who do not meet the minimum qualifications for surveyors, described above, would not be considered sufficient as a basis for the species absence.

Results from surveys conducted under environmental conditions that do not conform to the optimum climatic and phenological conditions, or time of day and other recommended methods described herein may be considered *unreliable*.

#### Reporting Results

Provide survey reports to the North Dakota Field Office by December 15 of the current field season along with a copy of their current recovery permit. The following information should be included:

- Geographic coordinates of any Dakota skipper observed and a map depicting the survey area(s), and survey route(s). In addition, include shapefiles of positive Dakota skipper occurrences and survey routes for each location surveyed whether Dakota skippers are observed or not.
- Provide maps depicting the location and extent of Dakota skipper habitat at the survey site. If possible, also provide the associated GIS data that could be used to identify the location and extent of Dakota skipper habitat, the survey area, and survey routes. Include coordinate system, projection and datum with all GIS data.

• For each survey include weather conditions: wind speed (or Beaufort Scale), air temperature, cloud cover, and the time at beginning and end of each survey route. In addition, include names of dominant flowering plants encountered during the survey (see Data Sheet in Appendix B).

## **Conclusion: Implication of Survey Results**

If Dakota skippers are not detected at a site using the methods described herein (for either 1 or two seasons of surveys), the Service will consider the species absent from a site for a period of one year from date of survey subject to the following circumstances:

- For sites > 1 km (0.6 mi) from a previously confirmed Dakota skipper sites:
  - Additional survey seasons of a site are unnecessary if the species has not been detected during three prior seasons of surveys. In this case, the site (plus the 250 m buffer) is considered 'not occupied by Dakota skippers' for a minimum of two (2) additional seasons (three (3) full seasons including the year of the last survey).
  - O Additional survey seasons may recommended to reassess species status at a site if the species is later confirmed to be present within 1 km (0.6 mi) of the site following the date of the last negative survey.
- For sites  $\leq 1$  km (0.6 mi) from a previously confirmed Dakota skipper sites:
  - Additional survey seasons of a site are unnecessary if the species has not been detected during three prior seasons of surveys. In this case, the site (plus the 500 m buffer) is considered 'not occupied by Dakota skippers' for a minimum of two (2) additional seasons (three (3) full seasons including the year of the last survey).

If one or more Dakota skippers are detected at a site, the Service will assume the site is occupied for a minimum of two additional years (three years total). Additional surveys before the three year minimum occupancy period are not recommended, but if completed and negative (no detections), the results will *not* supersede the occupied status. After three years, additional Dakota skipper surveys are recommended to update the occupancy status. A flowchart describing this process is included in Appendix C.

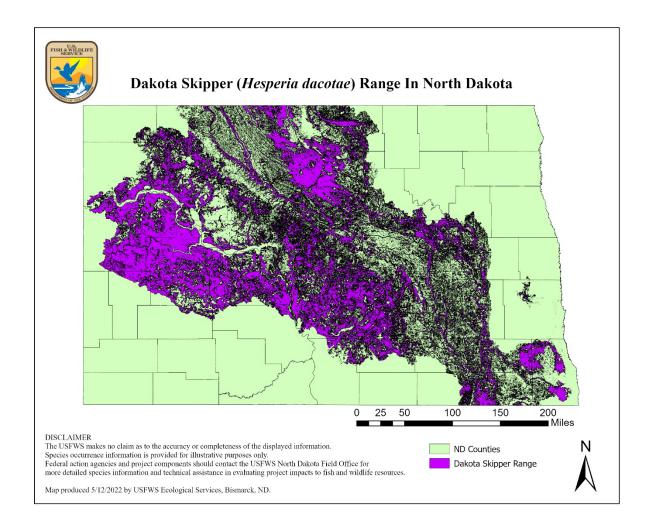
#### Literature Cited

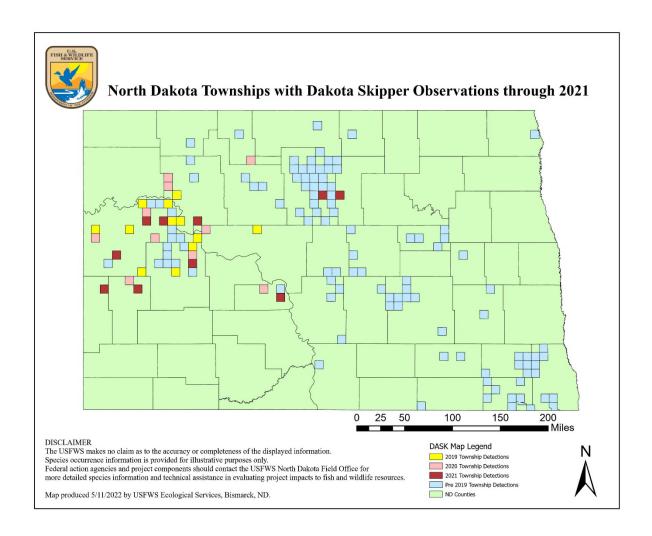
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### **APPENDICES**

# Appendix A





# **U.S. Drought Monitor North Dakota**

### May 3, 2022

(Released Thursday, May. 5, 2022) Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	_					
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	63.51	36.49	19.37	7.98	0.00	0.00
Last Week 04-26-2022	63.52	36.48	19.37	8.26	0.10	0.00
3 Months Ago 02-01-2022	19.47	80.53	52.23	26.27	7.04	0.00
Start of Calendar Year 01-04-2022	20.02	79.98	54.03	22.01	8.21	0.00
Start of Water Year 09-26-2021	0.24	99.76	99.64	92.08	58.62	0.43
One Year Ago 06-04-2021	0.00	100.00	97.84	92.99	84.98	0.00

Intensity:	
None	D2 Severe Drought
D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

<u>Author:</u> David Simeral Western Regional Climate Center

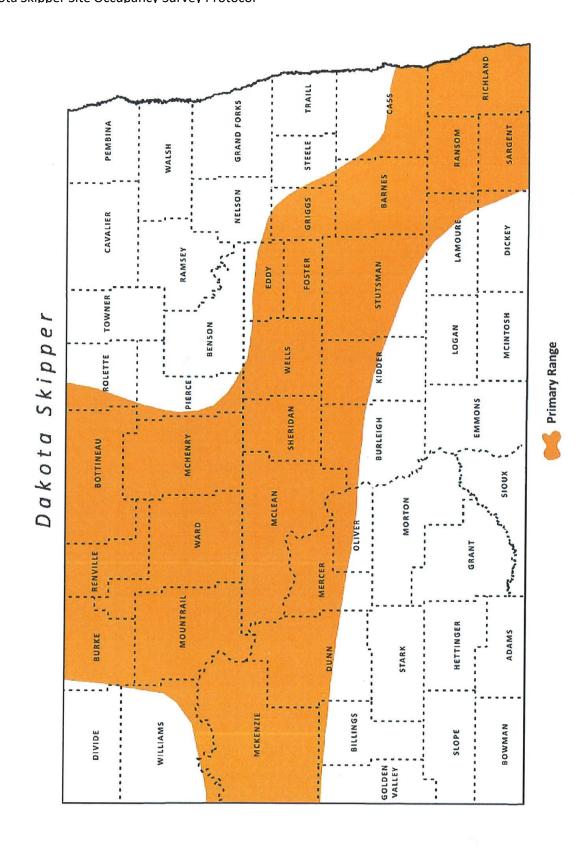








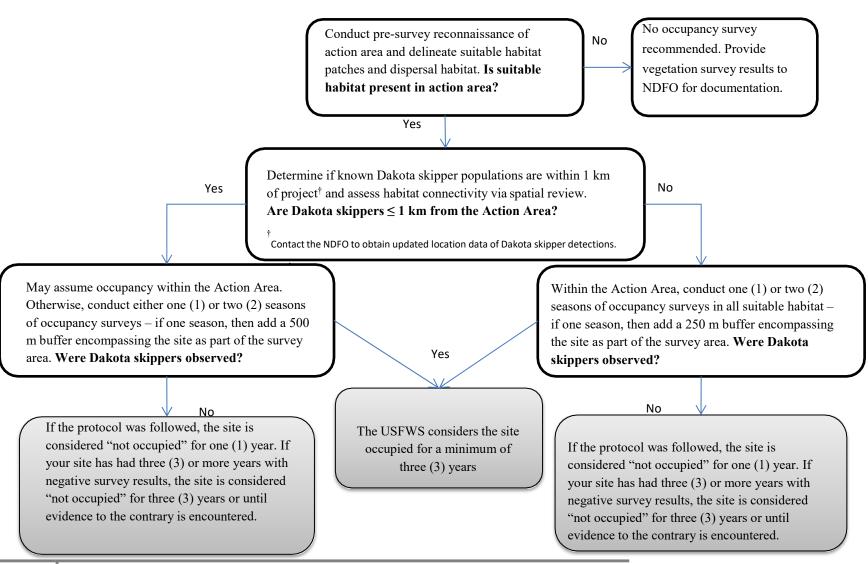
droughtmonitor.unl.edu



# Appendix B **Dakota Skipper Flowering Plant Line Count Data Sheet**

Site name/ID	Date				
County	Legal: <sup>1</sup> / <sub>4</sub> S,T,R				
SurveyofC	Observer(s)				
Species	Tally: flowering stems	n	<b>Tally: non-flowering stems</b>	n	
Purple coneflower					
Milkweed (all spp.)					
Vetch (all spp.)					
Alfalfa*					
Thistle (all spp.)					
Yellow coneflower					
Prairie Violet					
Goldenrod					
Wild Rose					
Curlycup gumweed					
Blazing star					
Penstemon spp.					
Smooth fleabane					
Western wallflower					
Prairie lily					
Purple prairie clover					
Black-eyed Susan					
Scarlet globemallow					
Maximilian sunflower					
Spiderwort					
Harebell					
Silverleaf scurfpea					
Leadplant					
Wild bergamot					
R. Mtn. bee-plant					
Blanket flower					
Dandelion					
NOTES:					

## Appendix C



Appendix B – 2023 Dakota Skipper Survey Forms Midwest Carbon Express Project in North Dakota

DAKOTA SKIPPER VEGETATION INVENTORY FORM					
Project: Midwest Carbon Express	Crew: Christensen, Culwell, Larsen, Reiser	Site ID: No_Hab_DASK_102			
	Date: 07/01/2023	Tract #s:			
	ND-OL-328-010.100 ND-OL-328-008.100				
Vegetation Community Type:	Grazing: None <u>Light</u> Moderate Heavy	ND-OL-1131.000			
Disturbed grassland, shrubby slopes					
Photo #s (Initial-#) PC2089 N, 2090-2093 NESW	Photo #s (Initial-#) PC2089 N, 2090-2093 NESW, 2094-2097 NESW, 2098-2101 NESW				
DASK Habitat Type: Mesic Native Prairie	Upland Native Prairie <u>Unsuitable</u>				
Temperature (F): 78	Percent Cloud Cover: 60-70	Windspeed (MPH): 2			

#### **DOMINANT SPECIES BY MORPHOLOGICAL CLASS**

PERENNIAL ANNUAL GRASSES GRASSES		PERE	PERENNIAL FORBS		SHRUBS	
BOUGRA: 15	None	ARTLUD: 2	PSOARG: trace	MELOFF: 70-80	SHEARG 0-5	
AGRSMI: 7		ARTDRA: 3	ARTFRI: 3	TRADUB: trace	SYMOCC: 1-25	
AGRCRI: 3		RATCOL: trace	ASTFAL: trace	SALKAL: 3	ROSARK: trace	
STIVIR: 3		LYGJUN: trace	ASTOBL: trace	ALYALY: trace	ELEANG: 2	
POAPRA: 25		PETPUR: trace	CIRUND: trace	ERYASP: trace	JUNHOR: trace	
BROINE: 4		*ARTABS: trace	ANTMIC: trace			
CARHEL: 11		ECHANG: trace	ACHMIL: trace			
STICOM: 1		VICAME: trace	MONFIS: 1			
CALLON: 10		HELANN: trace	AMBPSI: trace			
CARFIL: 3		LIAPUN: trace	*CIRARV: 1			
ANDSCO: trace		SOLMOL: trace	ERISTR: trace			

1

**Butterfly Species Observed and Number of Each:** 

Fritillary Common wood nymph 21 Cabbage white Clouded sulfur (netted) 16

Alfalfa 2

**NOTES** (Mgmt, context, mapping, etc): Although forb diversity is high, non-native species are also common and dominate floristic composition of the pasture. Minimal larval host plants. Presence of common wood nymph indicative of emergence potential for DASK but none observed. Per Jim Reiser, unsuitable DASK habitat.



DAKOTA SKIPPER VEGETATION INVENTORY FORM					
Project: Midwest Carbon Express	Crew: Christensen, Culwell, Larsen, Reiser	Site ID: No_Hab_DASK_103			
	Date: 06/29/2023	Tract #s:			
	Time of Day: 1000	ND-MO-1205.620			
	ND-MO-1205.120				
Vegetation Community Type:	Grazing: None <u>Light</u> Moderate Heavy	ND-MO-1201.170			
Disturbed mixed grass		ND-MO-1201.180			
Photo #s (Initial-#) PC2043 E, 2044-47 NESW, 3	2048-2051 NESW	ND-MO-1205.100			
DASK Habitat Type: Mesic Native Prairie Upland Native Prairie <u>Unsuitable</u>					
Temperature (F): 72	Percent Cloud Cover: 0	Windspeed (MPH): = 5</td			

#### DOMINANT SPECIES BY MORPHOLOGICAL CLASS

PERENNIAL GRASSES	ANNUAL GRASSES	PERI	ENNIAL FORBS	ANNUAL/BIENNAL FORBS	SHRUBS
BROINE: 40	None	PSOARG: 1	*EUPESU: trace	POLALB: trace	SHEARG: 2
AGRCRI: 5		ARTFRI: 1	ANTPAR: trace	MELOFF: trace	SYMOCC: 3
CALLON: 4		ECHANG: 1	VICAME: trace	TRADUB: trace	ROSARK: 2
POAPRA: 8		SOLMOL: 1	AMBPSI: trace	ERYASP: trace	ARTCAN: trace
POACOM: 8		RATCOL: trace	*ARTABS: trace	ALYALY: 2	
ANDSCO: 4		AMOCAN: 1	GEUTRI: trace		
STICOM: 6		LIAPON: trace	ARTDRA: trace		
CARFIL: 10		ACHMIL: trace	ARTCAM: trace		
ARILON: 1		ARTLUD: 1	DALPUR: trace		
CARHEL: 6		ERISTR: trace	POTENT: trace		
AGRSPI: 3		CIRUND: trace	COMUMB: trace		

#### **Butterfly Species Observed and Number of Each:**

Common wood nymph (males) 5 Alfalfa butterfly (males) 3 Cabbage (whites) 7 **NOTES** (Mgmt, context, mapping, etc): Dominated by smooth brome. Good forb diversity but low amounts of larval host plants. Per Jim Reiser unsuitable DASK habitat.



DAKOTA SKIPPER VEGETATION INVENTORY FORM					
Project: Midwest Carbon Express Crew: Christensen, Culwell, Larsen, Reiser		Site ID: No_Hab_DASK_104			
	Date: 06/29/2023	Tract #s:			
	Time of Day:1200	ND-MO-1205.130			
Vegetation Community Type:	Grazing: None <u>Light</u> Moderate Heavy	ND-MO-1211.100			
Variable grassland, Shrubby slopes					
Photo #s (Initial-#) PC2052-2055 NESW, 2056-2	Photo #s (Initial-#) PC2052-2055 NESW, 2056-2059 NESW, 2060-2063 NESW, 2064-2067 NESW				
DASK Habitat Type: Mesic Native Prairie	Upland Native Prairie Unsuitable				
Temperature (F): 79	Percent Cloud Cover: 0	Windspeed (MPH): 4-5			

#### DOMINANT SPECIES BY MORPHOLOGICAL CLASS

PERENNIAL GRASSES	ANNUAL GRASSES	PERE	PERENNIAL FORBS		SHRUBS
AGRSMI: 18	None	*EUPESU: trace	ARTFRI: trace	HELANN: trace	SHEARG: 28
POAPRA: 10		OXYSER: 1	GAIARI: trace	MELOFF: 40	SYMOCC: 8
HORJUB: 7		ECHANG: 1	ANTPAR: 1	TRADUB: trace	ARTCAN: 1
BROINE: 2		RATCOL: trace	ASTAGR: trace	ERYASP: trace	ROSARK: 3
ALOPEC: 5		AMOCAN: trace	OPUPOL: trace		PRUVIR: trace
AGRALB: 3		COMUMB: trace	SOLMOL: 1		CRA sp.: trace
STISPA: trace		DALPUR: trace	MEDSAT: trace		FRAPEN: trace
ELEOCH: 1		ACHMIL: trace	SPHCOC: trace		YUCGLA: trace
BOUCUR: 3		ASCPUM: trace	OPUFRA: trace		
CARFIL: 30		GEUTRI: trace	PSOARG: 1		
CARHEL: 24		CIRUND: trace	AMBPSI: trace		

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#### **Butterfly Species Observed and Number of Each:**

Common wood nymph (males) 23 Great spangled fritillary

Alfalfa butterfly (males)

Cabbage white

3 Melissa blue

3 Unid. Skipper

**NOTES** (Mgmt, context, mapping, etc): Marginal DASK habitat due to lack of larval host plants and high cover of yellow sweet clover. Areas out of study area and further uphill appear to have better habitat. Per Jim Reiser, this site is unsuitable for DASK.



DAKOTA SKIPPER VEGETATION INVENTORY FORM					
Project: Midwest Carbon Express	Crew: Christensen, Culwell, Larsen, Reiser  Date: 06/29/2023  Time of Day:1400	Site ID: No_Hab_DASK_105  Tract #s: ND-MO-1217.100			
Vegetation Community Type:  Non-native grassland	Grazing: None Light Moderate Heavy	ND-MO-1216.100			
Photo #s (Initial-#) PC2068-2071 NESW					
DASK Habitat Type: Mesic Native Prairie	Upland Native Prairie <u>Unsuitable</u>				
Temperature (F): 81	Percent Cloud Cover: 5	Windspeed (MPH): 9-15			
		·			

#### DOMINANT SPECIES BY MORPHOLOGICAL CLASS

PERENNIAL GRASSES	ANNUAL GRASSES	PERENNIAL FORBS		ANNUAL/BIENNAL FORBS	SHRUBS
BROINE: 75	None	ECHANG: 1		MELOFF: 2	ROSARK: 2
POAPRA: 35		MEDSAT: 2			
		PSOARG: 2			
		*CONARV: trace			
		HELANN: trace			
		AMBPSI: trace			

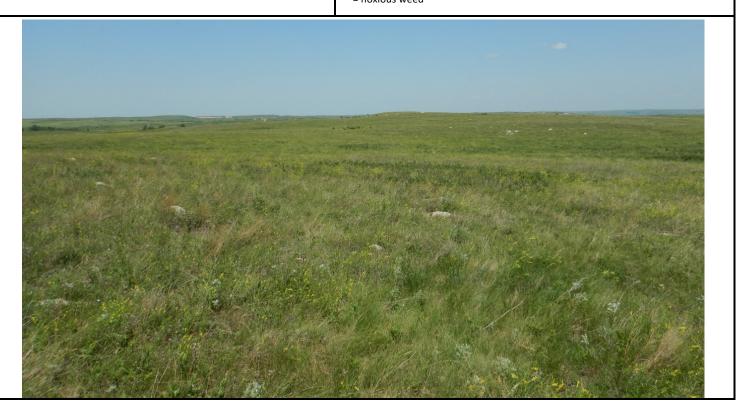
**Butterfly Species Observed and Number of Each:** 

Common wood nymph 1 Cabbage white

Alfalfa butterfly

**NOTES** (Mgmt, context, mapping, etc):

High cover of smooth brome and Kentucky bluegrass. No larval host plants, few nectar sources.



	DAKO	OTA SKIPPER VEG	ETATION INVEN	ITORY FORM		
Project: Midwest Carl	oon Express	Crew: Christensen,	Culwell, Larsen, Re	iser Site ID: No_Hab	_DASK_111	
		Date: 07/02/2023		Tract #s:		
		Time of Day:1130		ND-EO-0868	.000	
Vegetation Communit	ty Type:	Grazing: None Lig	ht <b>Moderate</b> He	eavy		
Mixed grass rangeland				,		
Photo #s (Initial-#) PC22	102-2105 NESW					
DASK Habitat Type:	Mesic Native Prairie	e Upland Nativ	e Prairie <u>Unsu</u>	itable		
Temperature (F): 80		Percent Cloud	d Cover: 10	Windsp	eed (MPH): 9-12	
		CLASS	SPECIES COVER			
			BY MORPHOLOGICA	L CLASS		
PERENNIAL GRASSES	ANNUAL GRASSES	PERE	NNIAL FORBS	ANNUAL/BIE FORBS	I SHRUBS	
BOUGRA: 45	None	ARTDRA: 6		None	None	
AGRSMI: 8		AMBPSI: 20				
CALLON: 10		ARTLUD: 12				
STICOM: 11		RATCOL: trace				
BROINE: trace		ARTFRI: 1				
		DALPUR: trace				
		HETVIL: trace				
		AMOCAN: trace				
Butterfly Species Observ None	ed and Number of Each:		NOTES (Mgmt, conte Per Jim Reiser, no sui sources, low forb dive	table habitat present. Few	larval host plants, few nectar	

	DAK	OTA SKIPPER VEG	ETATION	INVENTORY	FORM		
Project: Midwest Car	rbon Express	Crew: Christensen,	Culwell, La	rsen, Reiser	Site ID: No_Hab_DASK_1	112	
		Date: 07/02/2023			Tract #s:		
		Time of Day:1200			ND-EO-0866.000 ND-EO-0867.000		
Vegetation Commun	ity Type:	Grazing: None <u>Lig</u>	<b>ht</b> Moder	ate Heavy			
Non-native pasture							
Photo #s (Initial-#) PC2	2106 W, 2107 NW						
DASK Habitat Type:	Mesic Native Prairi	e Upland Nativ	e Prairie	<u>Unsuitable</u>			
Temperature (F): 88		Percent Cloud	d Cover: 0-	5	Windspeed (M	PH): 6	
		CLASS	SPECIES C	OVER			
		DOMINANT SPECIES	BY MORPHO	DLOGICAL CLASS			
PERENNIAL GRASSES	ANNUAL GRASSES	PERE	NNIAL FOR	BS	ANNUAL/BIENNAL FORBS	SHRUBS	
BROINE: 85	None	MEDSAT: 25			None	None	
Butterfly Species Obser	ved and Number of Each:		NOTES (Mg	mt, context, mappi	ng, etc):		
None			Dominated by smooth brome and alfalfa.				



	DAKO	TA SKIPPER VEGETATION INVENTORY	/ FORM
Project: Midwest Carb	oon Express	Crew: Christensen, Culwell, Larsen, Reiser	Site ID: No_Hab_DASK_113
		Date: 07/02/2023	Tract #s:
		Time of Day:1130	ND-EO-0863.000
Vegetation Communit	у Туре:	Grazing: None Light Moderate <u>Heavy</u>	ND-EO-0864.000 ND-EO-0865.000
Upland, Lowland grassl	and		
Photo #s (Initial-#) PC21	108-2112 NESW		
DASK Habitat Type:	Mesic Native Prairie	Upland Native Prairie <u>Unsuitable</u>	
Temperature (F): 88		Percent Cloud Cover: 0-5	Windspeed (MPH): 6+

#### DOMINANT SPECIES BY MORPHOLOGICAL CLASS

PERENNIAL GRASSES	ANNUAL GRASSES	PERE	ENNIAL FORBS	ANNUAL/BIENNAL FORBS	SHRUBS		
ARILON: 1	None	AMOCAN: 20	CIRUND: trace	ARAHOL: trace	ROSARK: 3		
POAPRA: 15		ARTLUD: 17	ARTCAM: trace	ERYASP: trace	PRUBES: 1		
STICOM: 25		OENSER: trace		TRADUB: trace			
CARFIL: 11		LIAPUN: trace					
CALLON: 14		ANECYL: 1					
BOUGRA: 18		AMBPSI: 4					
STIVIR: 6		ECHANG: trace					
BROINE: 8		*EUPESU: 3					
AGRCRI: 1		DALPUR: trace					
ANDSCO: trace		RATCOL: trace					

#### **Butterfly Species Observed and Number of Each:**

Wood nymph1American painted lady1Cabbage white3Delaware skipper1Pahaska skipper1Variegated fritillary1Coral hairstreak5Regal fritillary2Crossline skipper2

**NOTES** (Mgmt, context, mapping, etc):

Historically, heavily grazed. Ridges have best habitat but still marginal. Per Jim Reiser, no suitable habitat present. Few key species to support DASK although otherwise good butterfly diversity.



DAK	OTA SKIPPER VEGETATION INVENTORY	FORM
Project: Midwest Carbon Express	Crew: Christensen, Culwell, Larsen, Reiser	Site ID: No_Hab_DASK_114
	Date: 07/02/2023	Tract #s:
	Time of Day:1300	ND-EO-0861.000
Vegetation Community Type:	Grazing: None <u><b>Light</b></u> Moderate Heavy	
Non-native grassland		
Photo #s (Initial-#) DC88 S		
DASK Habitat Type: Mesic Native Prair	e Upland Native Prairie <u>Unsuitable</u>	
Temperature (F): 88	Percent Cloud Cover: 0-5	Windspeed (MPH): 6
	CLASS/SPECIES COVER	

#### DOMINANT SPECIES BY MORPHOLOGICAL CLASS

PERENNIAL GRASSES	ANNUAL GRASSES	PERENNIA	ANNUAL/BIENNAL FORBS	SHRUBS	
BROINE: 25	None	None		MELOFF: 6	None
POAPRA: 20				DESSOP: 2	
HORJUB: 5				CHELEP: 3	

**Butterfly Species Observed and Number of Each:** 

None

NOTES (Mgmt, context, mapping, etc):

Dominated by smooth brome and Kentucky bluegrass.



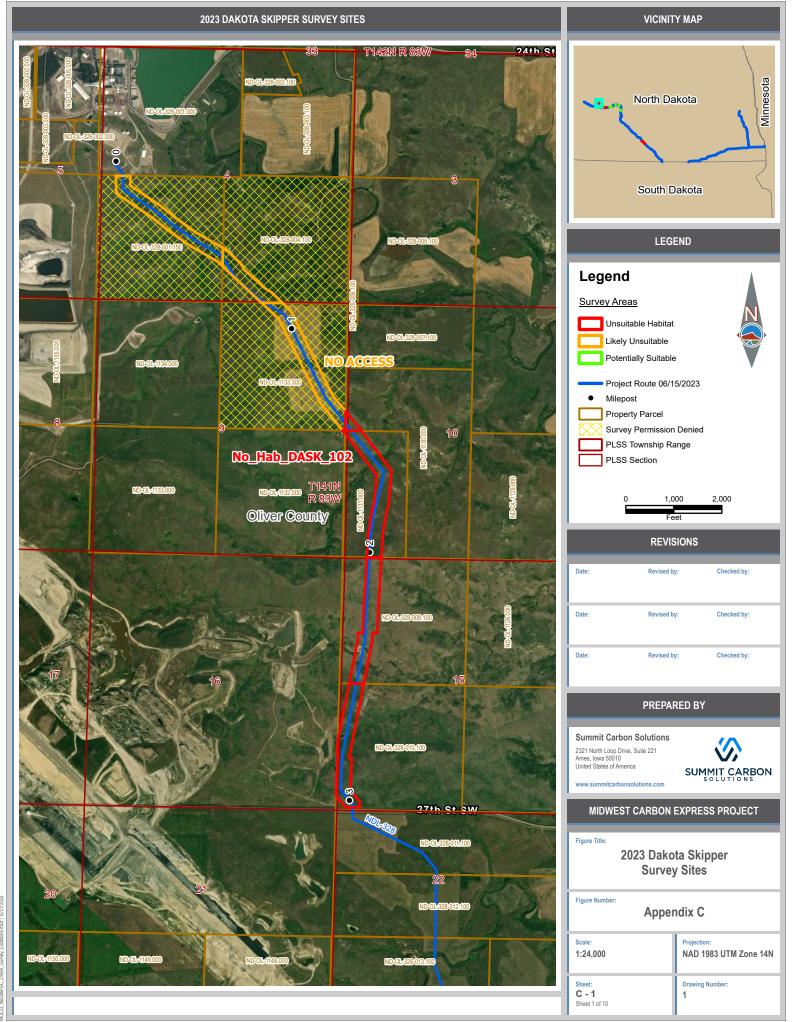
	DAKO	OTA SKIPPER VEG	ETAT	ION INVENTO	ORY	FORM	
Project: Midwest Cark	oon Express	Crew: Christensen,	Culwe	ll, Larsen, Reise	r,	Site ID: No_Hab_DASK_1	.15
		Date: 07/02/2023 Time of Day:1400				Tract #s: ND-LO-0858.000	
Vegetation Communit Non-native grassland	у Туре:	Grazing: None Lig	ht M	oderate Heavy	У		
Photo #s (Initial-#) DC89	)						
DASK Habitat Type:	Mesic Native Prairie	e Upland Nativ	e Prair	ie <u>Unsuita</u>	ble		
Temperature (F): 89		Percent Clou	d Cove	r: 0		Windspeed (MPF	H): 7+
		CLASS	/SPECI	ES COVER			
		DOMINANT SPECIES	ву мо	RPHOLOGICAL C	LASS		
PERENNIAL GRASSES	ANNUAL GRASSES	PERE	NNIAL	FORBS		ANNUAL/BIENNAL FORBS	SHRUBS
BROINE: 35	None	PSOARG: 4				None	None
AGRCRI: 50							
Butterfly Species Observe None	ed and Number of Each:			(Mgmt, context, nated by smooth b		ng, etc): nd crested wheatgrass, ver	ry low forb diversity.

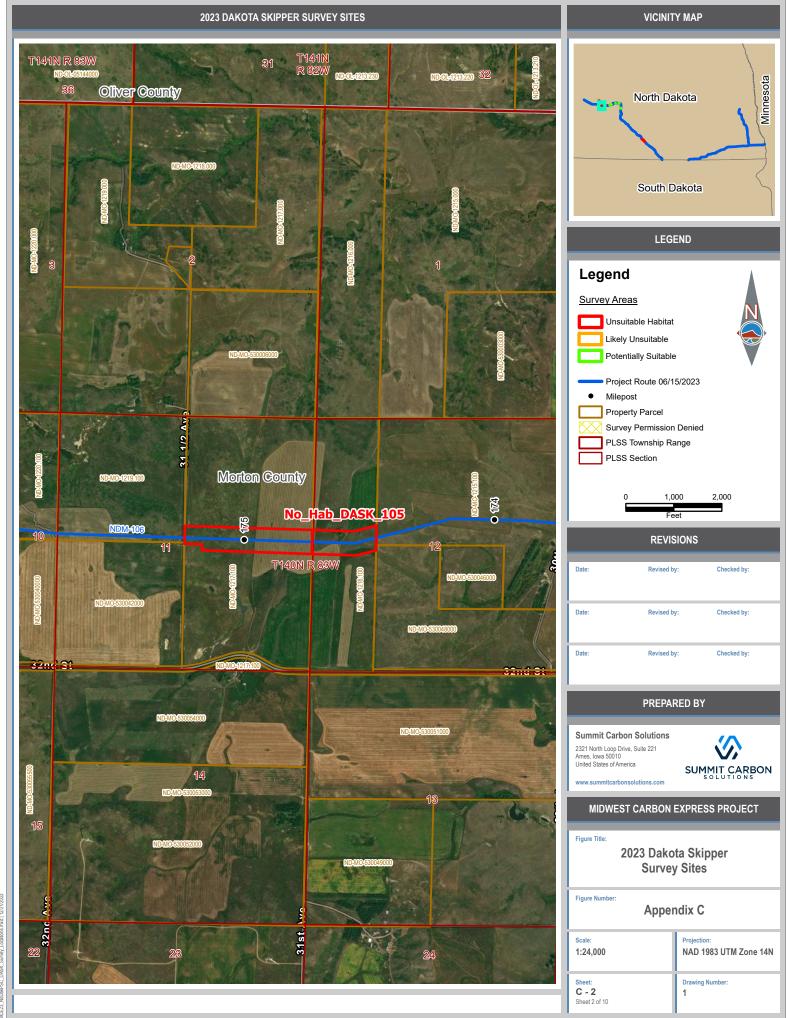


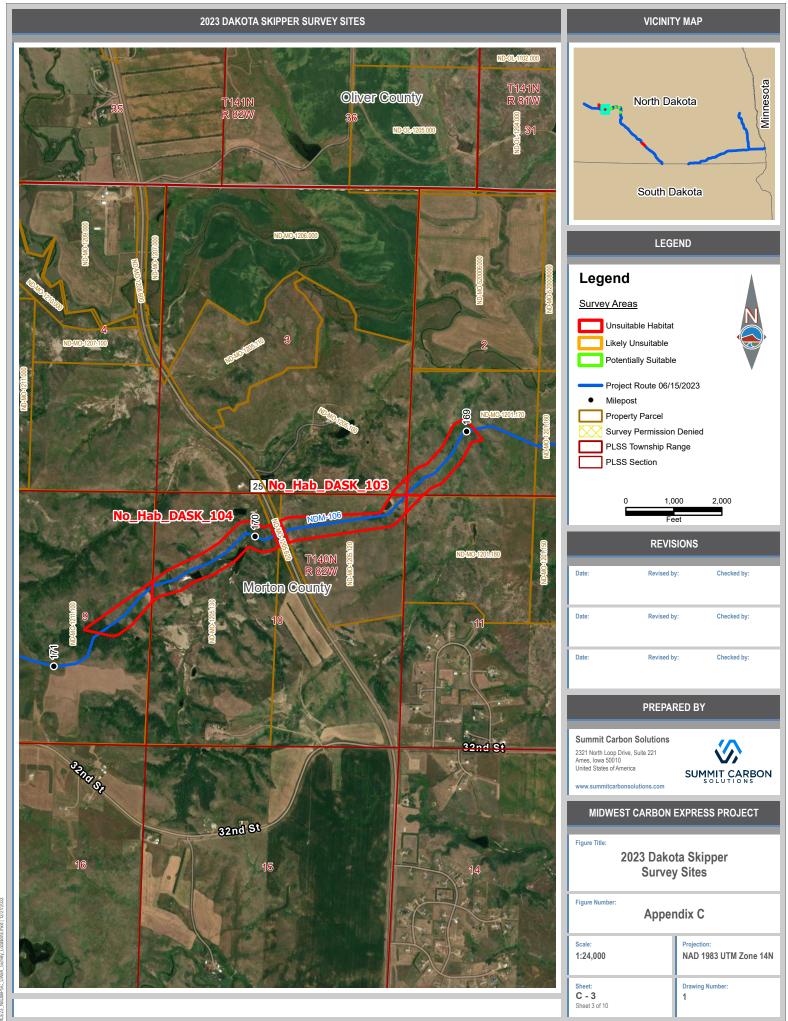
Project: Midwest Ca	arbon Express	Crew: Christensen, ( Reiser Jr.	Culwell, Lars	en, Reiser,	Site ID: No_Hab_DASK	_116
		Date: 07/02/2023 Time of Day:1500		Tract #s: ND-LO-0857.000 ND-LO-0855.000		
Vegetation Commu Non-native grassland		Grazing: <u>None</u> Ligh	nt Moderat	ND-LO-0855.100 ND-LO-0856.000		
Photo #s (Initial-#) DO	290					
DASK Habitat Type:	Mesic Native Prairie	Upland Native	e Prairie	<u>Unsuitable</u>		
Temperature (F): 89		Percent Cloud	Cover: 0		Windspeed (MF	PH): 7+
		CLASS/	SPECIES CO	VER		
		DOMINANT SPECIES I	BY MORPHOL	OGICAL CLASS		
PERENNIAL GRASSES	ANNUAL GRASSES	PEREN	NNIAL FORBS	6	ANNUAL/BIENNAL FORBS	SHRUBS
AGRCRI: 50	None	None			GLYMAX: 80	None
BROINE: 25						
POAPRA: 15						
Butterfly Species Obse None	rved and Number of Each:		, ,	•	ing, etc): ative grassland. Cover of g	rasses on strip adjacent t

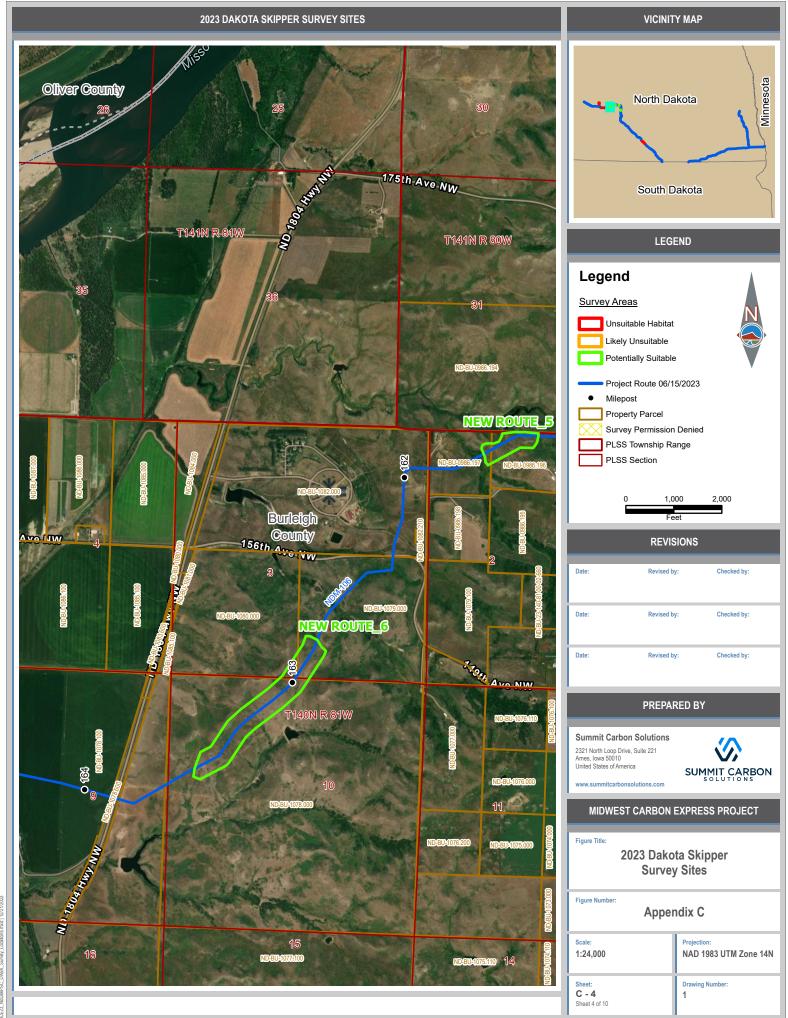


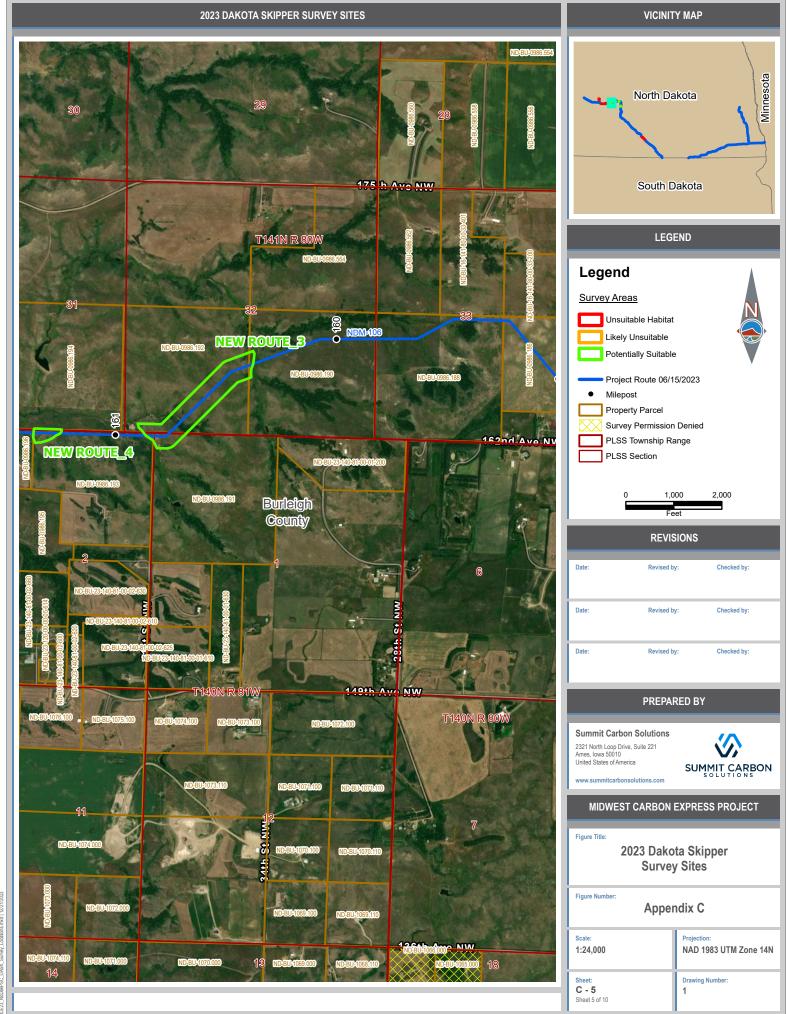
Appendix C – 2023 Dakota Skipper Survey Sites Midwest Carbon Express Project in North Dakota

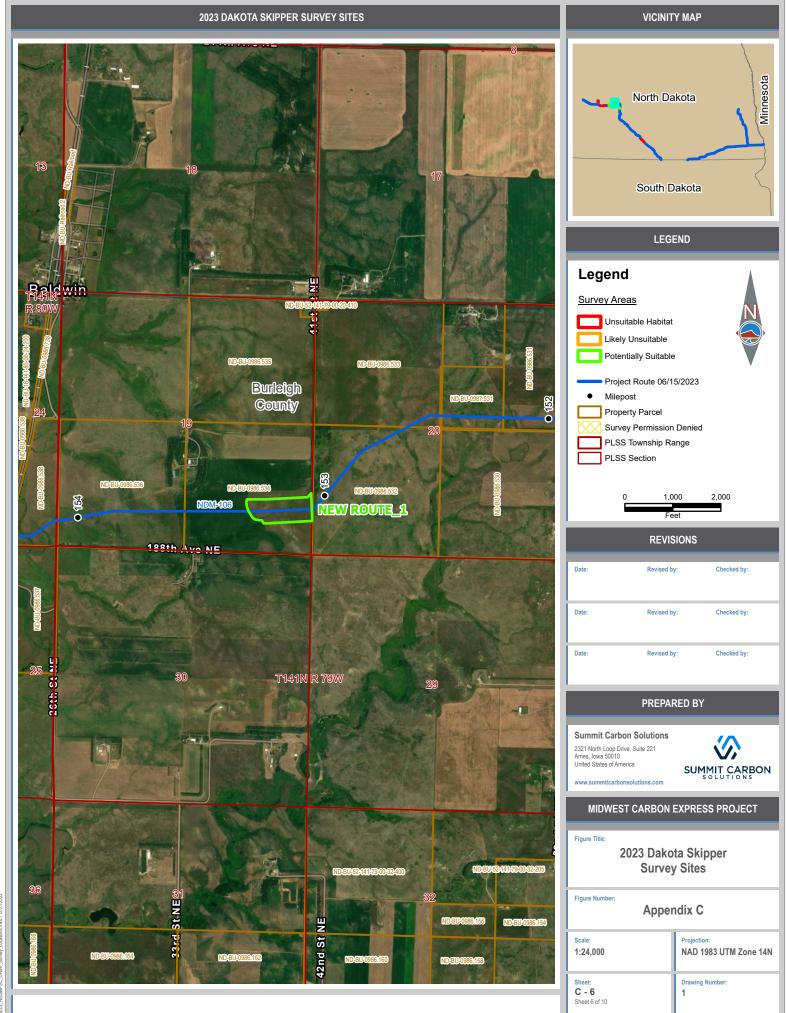


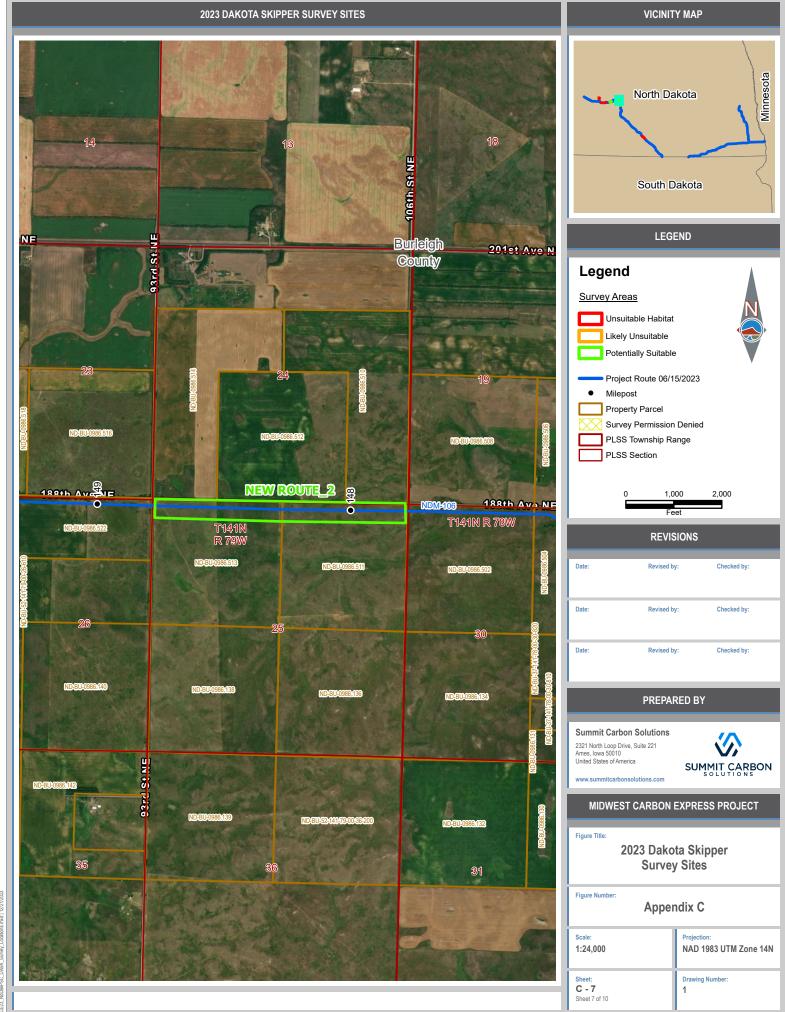


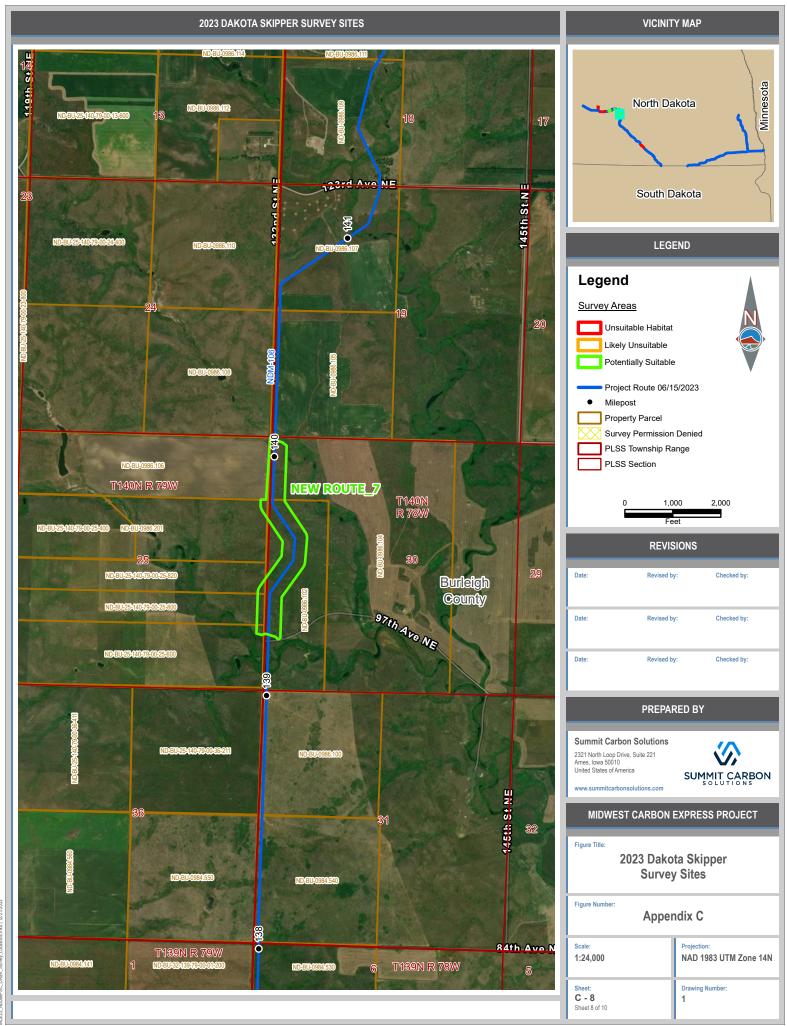


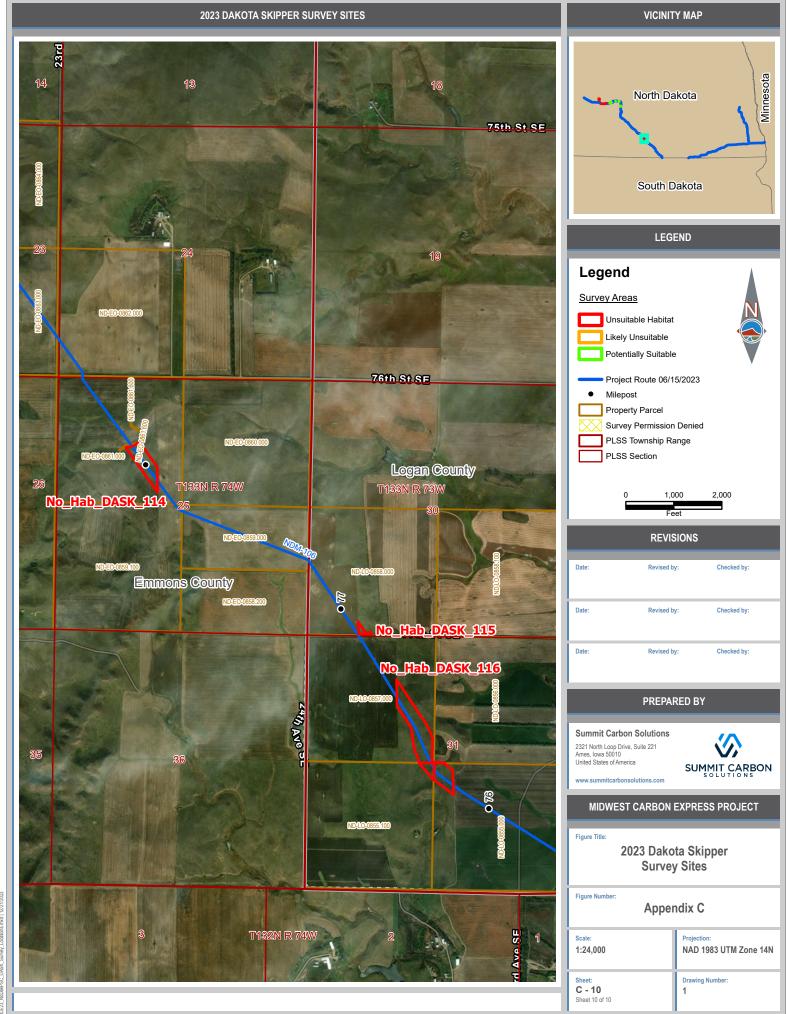












Summit Carbon Solutions SCS-0700-ENV-02-RPT-049 January 23, 2024

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Appendix D -

Northern Long-Eared Bat Wooded Areas, Habitat Components, Habitat Type, and Location within the Midwest Carbon Express ESA in North Dakota

Appendix D

Northern Long-Eared Bat Wooded Areas, Habitat Components, Habitat Type, and Location within the Midwest Carbon Express ESA in North Dakota

	Nearest	Wooded	Canopy	Stand	Water < 750r	- Ushitat	Uobitot	Human	Wooded Area < 1000 ft	Mondad Avan / 2 F mi	Mondad Avan Convented	Wooded Area < 2.5 mi	Wooded Avec 4 1000 ft		FWC Hobitot	Wooded Area		
Route	Route Milepost	Area > 14 ac (a)	Cover > 50 % (b)	Stand Structure (c)		m Habitat Code	Habitat Quality	Disturbance Proximal			Wooded Area Connected to Forage/Roosting Habitat	Mapped FWS NLEB Habitat	Wooded Area < 1000 ft Mapped FWS NLEB Habitat	Rationale for FWS Habitat Type	FWS Habitat Type	Wooded Area Size in ESA (ac)	Latitude	Longitude
NDM-106	201.24	No	Yes	Small	Yes	b,d	Low	No	Yes	No	No	Yes	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.43	47.059816	-101.614924
NDM-106		No	Yes	Small	Yes	b,d	Low	No	Yes	No No	No No	Yes	No No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.10	47.059073	-101.615062
NDL-328		No No	No Yes	Small Small	Yes Yes	b,d	Very Low Low	No No	Yes Yes	No Yes	No No	Yes Yes	No Yes	Wooded area > 1000 ft forest/wooded area & unconnected Individual trees > 1000 ft to forest/wooded area	Isolated Unsuitable	0.97	47.056611 47.056207	-101.604221 -101.204742
NDM-106		No	No	Small	Yes	d	Very Low	No	Yes	No	No	Yes	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.26	47.055939	-101.603055
NDM-106		No No	No No	Small Small	Yes No	d	Very Low Very Low	No No	Yes Yes	No No	No No	Yes Yes	No No	Wooded area > 1000 ft forest/wooded area & unconnected  Pure stand < 3 in dbh	Isolated Unsuitable	0.80	47.047174 47.044306	-101.579918 -101.56971
NDM-106		No	No	Small	Yes	d	Very Low	No	Yes	No	No	Yes	No	Pure stand < 3 in dbh	Unsuitable	0.09	47.040095	-101.558397
NDM-106		No	No	Small	Yes	d	Very Low	No	Yes	No	No	Yes	No	Pure stand < 3 in dbh	Unsuitable	0.15	47.036568	-101.554347
NDM-106		No No	Yes No	Small Mixed	Yes No	b,d c	Low Very Low	No Yes, road	Yes No	No No	No No	Yes Yes	No No	Pure stand < 3 in dbh  Wooded area > 1000 ft forest/wooded area & unconnected	Unsuitable Isolated	0.14	47.036322 47.015272	-101.552458 -100.727969
NDM-106		No	Yes	Mixed	No	b,c	Low	Yes	Yes	No	No	Yes	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	2.59	47.012733	-100.767755
NDM-106		No No	No	Small Mixed	No	-	Very Low	Yes road	Yes No	No No	No No	Yes No	No No	Pure stand < 3 in dbh	Unsuitable	0.23 12.10	47.012517	-100.770256 -100.65315
NDM-106		No	No Yes	Mixed	No No	b,c	Very Low Low	Yes, road No	No	Yes	No	Yes	No	Individual trees > 1000 ft to forest/wooded area  Wooded area > 1000 ft forest/wooded area & unconnected	Unsuitable Isolated	0.53	47.011834 47.011394	-100.65315
NDM-106		No	Yes	Mixed	No	b,c	Low	No	No	Yes	No	Yes	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.55	47.011378	-100.794321
NDM-106		No No	Yes No	Small Mixed	No No	b C	Very Low Very Low	No No	No No	Yes Yes	No No	Yes Yes	No No	Pure stand < 3 in dbh  Wooded area > 1000 ft forest/wooded area & unconnected	Unsuitable Isolated	0.21	47.011332 47.011303	-100.796948 -100.798279
NDM-106		No	Yes	Mixed	No	b,c	Low	No	No	Yes	No	Yes	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.47	47.011303	-100.798279
NDM-106		No	Yes	Mixed	No	b,c	Low	No	No	Yes	No	Yes	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.83	47.010574	-100.800921
NDM-106		No	No	Mixed Mixed	No No	C	Very Low	No No	Yes	Yes	Yes Yes	Yes Yes	No No	Suitable connected NLEB habitat Suitable connected NLEB habitat	Suitable Suitable	0.98	46.990376	-100.82341 -100.82646
NDM-106		No Yes	Yes Yes	Mixed	Yes	b,c a,b,c,d	Low High	No	Yes Yes	Yes Yes	Yes	Yes	No No	Suitable connected NLEB habitat	Suitable	3.04	46.989671 46.988928	-100.82646
NDM-106	160.73	No	No	Small	Yes	d	Very Low	No	No	Yes	No	Yes	Yes	Pure stand < 3 in dbh	Unsuitable	1.43	46.983637	-100.849965
NDM-106		No No	No No	Small Small	Yes Yes	d d	Very Low Very Low	No No	No No	Yes Yes	No No	Yes Yes	Yes Yes	Pure stand < 3 in dbh Pure stand < 3 in dbh	Unsuitable Unsuitable	0.10 1.41	46.982988 46.982799	-100.854651 -100.855962
NDM-106		No	No	Small	Yes	d	Very Low	No	No	Yes	No	Yes	Yes	Pure stand < 3 in dbh	Unsuitable	0.90	46.982614	-100.853234
NDM-106		No	No	Mixed	Yes	c,d	Low	No	Yes	Yes	Yes	Yes	Yes	Suitable connected NLEB habitat	Suitable	1.70	46.981664	-100.86937
NDM-106	183.74 183.61	No No	Yes No	Small Large	Yes Yes	b,d c,d	Low	Road No	Yes Yes	No No	No No	No No	No No	Wooded area > 1000 ft forest/wooded area & unconnected  Wooded area > 1000 ft forest/wooded area & unconnected	Isolated Isolated	0.02	46.981312 46.981172	-101.283501 -101.280658
NDM-106		No	Yes	Small	No	b	Very Low	No	No	No	No	Yes	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.16	46.980252	-101.372347
NDM-106		No	No	Mixed	Yes	c,d	Low	No	Yes	Yes	Yes	Yes	Yes	Suitable connected NLEB habitat	Suitable	1.12	46.972837	-100.88096
NDM-106	166.30 165.12	No Yes	No Yes	Mixed Mixed	Yes Yes	c,d a,b,c,d	Low High	No No	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Suitable connected NLEB habitat Suitable connected NLEB habitat	Suitable Suitable	1.93 2.25	46.964098 46.963691	-100.949841 -100.924853
NDM-106		Yes	No	Mixed	Yes	a,c,d	Moderate	No	Yes	Yes	Yes	Yes	Yes	Suitable connected NLEB habitat	Suitable	4.50	46.963668	-100.927453
NDM-106		No	Yes	Mixed	Yes	b,c,d	Moderate	No	Yes	Yes	Yes	Yes	Yes	Suitable connected NLEB habitat	Suitable	0.98	46.963011	-100.909043
NDM-106		No No	No No	Small Small	Yes Yes	d d	Very Low Very Low	No No	Yes No	Yes No	No No	Yes No	No No	Pure stand < 3 in dbh (Shearg, Pruame) Individual trees > 1000 ft to forest/wooded area	Unsuitable Unsuitable	1.21 0.23	46.959694 46.958032	-101.027431 -100.575652
NDM-106		No	No	Small	Yes	d	Very Low	No	Yes	Yes	No	Yes	No	Pure stand < 3 in dbh (Shearg, Pruame)	Unsuitable	0.23	46.957967	-101.029463
NDM-106		No	No	Small	Yes	d	Very Low	No	No	Yes	No	No	No	Individual trees > 1000 ft to forest/wooded area	Unsuitable	0.20	46.957845	-101.111588
NDM-106		No No	Yes No	Small Small	Yes Yes	b,d d	Low Very Low	No No	Yes No	Yes No	No No	Yes No	No No	Pure stand < 3 in dbh (Shearg, Pruame) Individual trees > 1000 ft to forest/wooded area	Unsuitable Unsuitable	9.35 0.26	46.956639 46.954428	-101.032883 -100.573873
NDM-106		No	Yes	Mixed	Yes	b,c,d	Moderte	No	Yes	No	No	No	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.55	46.952645	-100.57324
NDM-106		No	No	Mixed	Yes	c,d	Low	Yes, road	Yes	No	No	No	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	2.24	46.939862	-100.572725
NDM-106	134.83 133.86	No No	No Yes	Mixed Small	Yes Yes	c,d b,d	Low	No Yes	Yes Yes	Yes Yes	Yes No	Yes Yes	Yes No	Suitable connected NLEB habitat  Pure stand < 3 in dbh	Suitable Unsuitable	1.70 0.40	46.852061 46.838901	-100.583352 -100.580732
NDM-106		No	Yes	Small	No	b	Very Low	No	Yes	Yes	No	Yes	No	Pure stand < 3 in dbh	Unsuitable	0.08	46.838793	-100.567516
NDM-106		No	Yes	Small	No	b	Very Low	Highway	Yes	Yes	No	Yes	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.85	46.835622	-100.56628
NDL-324 NDL-324	4.80 4.85	No No	Yes No	Small Small	Yes Yes	b,d d	Low Very Low	No No	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Suitable connected NLEB habitat Suitable connected NLEB habitat	Suitable Suitable	0.37	46.834985 46.834162	-97.2857 -97.285447
NDL-324		No	No	Small	Yes	d	Very Low	No	Yes	Yes	No	Yes	Yes	Pure stand < 3 in dbh	Unsuitable	0.11	46.832485	-97.285733
NDM-106		No	Yes	Small	Yes	b,d	Low	No	Yes	Yes	No V	Yes	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	3.40	46.829432	-100.566366
NDL-324 NDM-106		No No	Yes Yes	Mixed Small	Yes Yes	b,c,d b,d	Moderate Low	No Road	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes No	Suitable connected NLEB habitat  Pure stand < 3 in dbh	Suitable Unsuitable	0.48	46.828692 46.821965	-97.285639 -100.561681
NDL-324	6.47	No	Yes	Small	Yes	b,d	Low	No	Yes	Yes	Yes	Yes	Yes	Suitable connected NLEB habitat	Suitable	0.35	46.818652	-97.274028
NDM-106		No No	Yes	Small	Yes	b,d	Low	No No	No No	Yes	No No	Yes	No No	Pure stand < 3 in dbh	Unsuitable	0.08	46.813292	-100.554827 -100.555833
NDIN-106		No No	Yes Yes	Small Mixed	Yes No	b,d b,c	Low	No No	No Yes	Yes Yes	No No	Yes Yes	No No	Pure stand < 3 in dbh Wooded area > 1000 ft forest/wooded area & unconnected	Unsuitable Isolated	0.08 3.20	46.813214 46.810638	-100.555833 -97.25964
NDM-106	130.72	No	No	Large	No	С	Very Low	Road	Yes	Yes	No	Yes	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.10	46.808572	-100.552404
NDM-106		No No	Yes Yes	Small Mixed	No No	b b.c	Very Low Low	No No	Yes Yes	Yes Yes	No No	Yes Yes	No No	Wooded area > 1000 ft forest/wooded area & unconnected Wooded area > 1000 ft forest/wooded area & unconnected	Isolated Isolated	0.57 0.04	46.788481	-100.570854 -100.572301
NDM-106		No	No	Small	No	b,c -	Very Low	Road	Yes	Yes	No No	Yes	No No	Pure stand < 3 in dbh	Unsuitable	0.04	46.787957 46.782577	-100.572301
NDM-106	127.93	No	No	Small	Yes	d	Very Low	Road	Yes	Yes	No	Yes	No	Pure stand < 3 in dbh	Unsuitable	0.16	46.780098	-100.587711
NDM-106		No No	Yes	Small Small	Yes Yes	b,d	Low Very Low	Yes	Yes No	Yes Yes	No No	No No	No No	Wooded area > 1000 ft forest/wooded area & unconnected  Pure stand < 3 in dbh (Shearg, Pruame)	Isolated	0.72	46.774908 46.756656	-100.5874 -100.584569
NDM-106		No No	No No	Small	Yes	d d	Very Low	No No	No No	Yes Yes	No No	No No	No No	Pure stand < 3 in dbn (Snearg, Pruame)  Pure stand < 3 in dbh (Shearg, Pruame)	Unsuitable Unsuitable	0.69	46.753726	-100.584569 -100.584354
NDL-324	13.25	No	Yes	Mixed	Yes	b,c,d	Moderate	No	Yes	Yes	Yes	Yes	Yes	Suitable connected NLEB habitat	Suitable	0.41	46.750511	-97.209133
NDL-324 NDL-324		No No	Yes Yes	Mixed Mixed	Yes	b,c,d	Moderate Moderate	No Road	Yes	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Suitable connected NLEB habitat Suitable connected NLEB habitat	Suitable Suitable	0.49 1.07	46.745647 46.745218	-97.206722 -97.206696
NDL-324		No	Yes	Small	Yes Yes	b,c,d b,d	Low	No	Yes Yes	No Yes	No Yes	No Yes	No Yes	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	2.29	46.745218	-100.584697
NDM-106	123.29	No	No	Small	Yes	d	Very Low	No	No	Yes	No	No	No	Pure stand < 3 in dbh (Shearg, Pruame)	Unsuitable	1.02	46.714194	-100.581076
NDM-106		No No	Yes	Small	Yes	b,d	Low	No No	Yes	Yes	No No	No No	No No	Pure stand < 3 in dbh (Shearg, Pruame)	Unsuitable	0.61	46.711395 46.711127	-100.575356 -100.574425
NDM-106		No No	Yes Yes	Small Small	Yes Yes	b,d b,d	Low	No No	Yes Yes	Yes Yes	No No	No No	No No	Pure stand < 3 in dbh Pure stand < 3 in dbh (Shearg, Pruame)	Unsuitable Unsuitable	0.36 1.37	46.711127	-100.574425 -100.573567
NDM-106	122.66	No	Yes	Small	Yes	b,d	Low	Road	Yes	Yes	No	No	No	Pure stand < 3 in dbh (Shearg, Pruame)	Unsuitable	0.57	46.708637	-100.570845
NDM-106		No No	Yes No	Small	Yes	b,d	Low Very Low	No No	Yes	No No	No No	No No	No No	Wooded area > 1000 ft forest/wooded area & unconnected Wooded area > 1000 ft forest/wooded area & unconnected	Isolated Isolated	0.37	46.703728 46.702683	-100.564429 -100.563982
NDM-106		No No	No No	Small Small	Yes Yes	d	Very Low Very Low	No No	Yes Yes	No No	No No	No No	No No	Wooded area > 1000 ft forest/wooded area & unconnected  Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	1.58	46.702683	-100.563982 -100.562908
NDM-106	122.04	No	No	Small	Yes	d	Very Low	No	Yes	Yes	Yes	No	No	Pure stand < 3 in dbh	Unsuitable	0.36	46.701457	-100.562946
NDM-106		No	No	Small	Yes	d	Very Low		Yes	Yes	Yes	No No	No No	Pure stand < 3 in dbh	Unsuitable	0.30	46.70077	-100.561958
NDM-106	121.84	No	Yes	Mixed	Yes	D,C,d	Moderate	No	Yes	No	No	No	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.40	46.699781	-100.559475

Appendix D

Northern Long-Eared Bat Wooded Areas, Habitat Components, Habitat Type, and Location within the Midwest Carbon Express ESA in North Dakota

Route	Nearest Route	Wooded Area > 14 ac	Canopy Cover > 50 %	Stand	Water < 750m	Habitat	Habitat	Human Disturbance	Wooded Area < 1000 ft	Wooded Area < 2.5 mi	Wooded Area Connected	Wooded Area < 2.5 mi	Wooded Area < 1000 ft	Rationale for FWS Habitat Type	FWS Habitat	Wooded Area	Latitude	Longitude
noute	Milepost	(a)	(b)	Structure (c)	(d)	Code	Quality	Proximal	to Commuting Habitat	Forage/Roosting Habitat	to Forage/Roosting Habitat	Mapped FWS NLEB Habitat	Mapped FWS NLEB Habitat	nationale for First habitat Type	Туре	Size in ESA (ac)	Latitude	Longitude
NDM-106	121.71	No	Yes	Small	Yes	b,d	Low	No	Yes	No	No	No	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.42	46.698667	-100.557365
NDM-106	121.56	No	Yes	Small	No	b	Very Low	No	Yes	No No	No	No No	No No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.27	46.696649	-100.556007
NDM-106 NDM-106	121.48 121.42	No No	Yes Yes	Small Small	No No	b b	Very Low Very Low	No No	Yes Yes	No No	No No	No No	No No	Wooded area > 1000 ft forest/wooded area & unconnected Wooded area > 1000 ft forest/wooded area & unconnected	Isolated Isolated	0.47	46.695667 46.694842	-100.555012 -100.554406
NDM-106	121.35	No	Yes	Small	No	b	Very Low	No	Yes	No	No	No	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.48	46.694159	-100.553298
NDM-106 NDM-106	121.22 121.08	No No	No No	Small Small	No No	-	Very Low Very Low	No No	Yes Yes	Yes Yes	Yes Yes	No No	No No	Pure stand < 3 in dbh Pure stand < 3 in dbh	Unsuitable Unsuitable	0.16 0.05	46.692796 46.691622	-100.551638 -100.549023
NDM-106	121.00	No	Yes	Small	No	b	Very Low	No	Yes	No	No	No	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	1.13	46.690457	-100.54843
NDM-106	120.95	No	Yes	Small	No	b	Very Low	No	Yes	No	No	No	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.83	46.689783	-100.547905
NDM-106 NDM-106	120.84 120.77	No No	Yes Yes	Small Small	No No	b b	Very Low Very Low	No No	Yes Yes	No No	No No	No No	No No	Wooded area > 1000 ft forest/wooded area & unconnected Wooded area > 1000 ft forest/wooded area & unconnected	Isolated Isolated	0.38	46.688764 46.688015	-100.54622 -100.545135
NDM-106	120.73	No	No	Small	No	-	Very Low	No	Yes	Yes	Yes	No	No	Pure stand < 3 in dbh	Unsuitable	0.03	46.687212	-100.545049
NDM-106 NDL-324	118.56 20.80	No No	No Yes	Small Mixed	Yes No	d	Very Low	Road	Yes Yes	Yes Yes	No No	No No	No No	Pure stand < 3 in dbh Wooded area > 1000 ft forest/wooded area & unconnected	Unsuitable Isolated	0.45 1.48	46.677807 46.65685	-100.504544 -97.157294
NDM-106		No	No	Small	No	b,c -	Low Very Low	No No	Yes	Yes	No	No	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.50	46.653596	-100.461009
NDM-106	115.76	No	No	Small	No	-	Very Low	No	Yes	Yes	No	No	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.45	46.652651	-100.459001
NDM-106 NDL-324	115.65 21.17	No No	No Yes	Small Mixed	No No	b,c	Very Low Low	No No	Yes No	Yes Yes	No No	No No	No No	Wooded area > 1000 ft forest/wooded area & unconnected Individual trees > 1000 ft to forest/wooded area	Isolated Unsuitable	0.46	46.651787 46.651418	-100.457165 -97.157252
NDL-324	21.62	No	Yes	Mixed	No	b,c	Low	Road	Yes	Yes	Yes	No	No	Suitable connected NLEB habitat	Suitable	0.81	46.644974	-97.157195
NDL-324	21.74	No	Yes	Mixed	No	b,c	Low	Road	Yes	Yes	Yes	No No	No No	Suitable connected NLEB habitat	Suitable	1.20	46.643256	-97.157119
NDL-324 NDM-106		No No	Yes No	Mixed Small	No Yes	b,c d	Low Very Low	No No	Yes Yes	Yes Yes	Yes No	No No	No No	Suitable connected NLEB habitat Wooded area > 1000 ft forest/wooded area & unconnected	Suitable Isolated	0.15 0.92	46.642152 46.641777	-97.15584 -100.445928
NDL-324	21.84	No	Yes	Mixed	No	b,c	Low	No	Yes	Yes	Yes	No	No	Suitable connected NLEB habitat	Suitable	0.53	46.641753	-97.156917
NDL-324 NDL-324		No Yes	Yes Yes	Mixed Mixed	No No	b,c a,b,c	Low Moderate	No No	Yes Yes	Yes Yes	Yes Yes	No No	No No	Suitable connected NLEB habitat Suitable connected NLEB habitat	Suitable Suitable	5.60 7.67	46.635179 46.620626	-97.156554 -97.148533
NDL-324		Yes	Yes	Mixed	No	a,b,c	Moderate	No	Yes	Yes	Yes	No	No No	Suitable connected NLEB habitat	Suitable	1.24	46.620626	-97.14871
NDL-324		No	Yes	Mixed	No	b,c	Low	No	Yes	Yes	Yes	No	No	Suitable connected NLEB habitat	Suitable	5.22	46.61481	-97.148521
NDL-324 NDL-324		No No	No Yes	Small Mixed	No No	b,c	Very Low Low	No No	Yes Yes	Yes Yes	Yes Yes	No Yes	No No	Suitable connected NLEB habitat Suitable connected NLEB habitat	Suitable Suitable	0.09	46.608953 46.599785	-97.148011 -97.132744
NDL-324		No	No	Mixed	No	C	Very Low	No	Yes	Yes	Yes	Yes	No	Suitable connected NLEB habitat	Suitable	0.03	46.598507	-97.129858
NDL-324		No	No	Mixed	No	С	Very Low	No	Yes	Yes	Yes	Yes	No	Suitable connected NLEB habitat	Suitable	0.10	46.597861	-97.12747
NDL-324 NDL-324		No No	No No	Mixed Mixed	No No	C	Very Low Very Low	No No	Yes Yes	Yes Yes	Yes Yes	Yes Yes	No No	Suitable connected NLEB habitat Suitable connected NLEB habitat	Suitable Suitable	0.09	46.597238 46.597007	-97.125207 -97.124064
NDL-324	25.81	No	No	Mixed	No	С	Very Low	No	Yes	Yes	Yes	Yes	No	Suitable connected NLEB habitat	Suitable	0.19	46.596432	-97.122345
NDL-324 NDL-324		No No	Yes Yes	Mixed Mixed	No No	b,c b,c	Low	No No	Yes Yes	Yes Yes	Yes Yes	Yes Yes	No No	Suitable connected NLEB habitat Suitable connected NLEB habitat	Suitable Suitable	0.13 0.23	46.59348 46.593295	-97.116434 -97.115512
NDL-324		No	Yes	Mixed	No	b,c	Low	No	Yes	Yes	Yes	Yes	No	Suitable connected NLEB habitat	Suitable	1.00	46.592736	-97.110985
NDL-324	26.78	No	Yes	Mixed	No	b,c	Low	No	Yes	Yes	Yes	Yes	No	Suitable connected NLEB habitat	Suitable	1.21	46.590123	-97.104989
NDM-106 NDM-106	108.53 107.74	No No	Yes Yes	Mixed Mixed	Yes Yes	b,c,d b,c,d	Moderate Moderate	Road No	Yes Yes	Yes Yes	No No	No No	No No	Wooded area > 1000 ft forest/wooded area & unconnected Wooded area > 1000 ft forest/wooded area & unconnected	Isolated Isolated	2.55 0.40	46.589226 46.579121	-100.355694 -100.35176
NDL-324	27.92	Yes	Yes	Mixed	Yes	a,b,c,d	High	No	Yes	Yes	Yes	Yes	Yes	Suitable connected NLEB habitat	Suitable	13.95	46.575385	-97.096162
NDL-324		Yes	Yes	Mixed	Yes	a,b,c,d	High	No	Yes	Yes	Yes	Yes	Yes	Suitable connected NLEB habitat	Suitable	10.05	46.571583	-97.092142
NDL-324 NDL-324		No No	No No	Mixed Mixed	Yes Yes	c,d c,d	Low	No No	Yes Yes	Yes Yes	Yes Yes	Yes Yes	Yes No	Suitable connected NLEB habitat Suitable connected NLEB habitat	Suitable Suitable	0.48 2.32	46.568104 46.56487	-97.088605 -97.086058
NDL-324	29.03	No	No	Mixed	No	С	Very Low	No	Yes	Yes	Yes	Yes	No	Suitable connected NLEB habitat	Suitable	0.10	46.561613	-97.084026
NDL-324 NDL-324		No No	No Yes	Mixed Mixed	No No	b,c	Very Low Low	No No	Yes Yes	Yes Yes	Yes No	Yes Yes	No No	Suitable connected NLEB habitat Wooded area > 1000 ft forest/wooded area & unconnected	Suitable Isolated	2.90 0.47	46.559343 46.549368	-97.08195 -97.074204
NDL-324		No	Yes	Small	No	b,c	Very Low	No	Yes	Yes	No	Yes	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.14	46.545476	-97.074204
NDL-324	30.34	No	Yes	Small	No	b	Very Low	No	Yes	Yes	No	Yes	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.41	46.54468	-97.07391
NDL-324 NDL-324		No No	No Yes	Small Mixed	No No	b,c	Very Low Low	Road No	Yes Yes	Yes Yes	No No	Yes No	No No	Pure stand < 3 in dbh Wooded area > 1000 ft forest/wooded area & unconnected	Unsuitable Isolated	0.09	46.536096 46.534358	-97.073546 -97.073585
NDL-324		No	Yes	Mixed	No	b,c	Low	No	Yes	Yes	No	No	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	1.16	46.525713	-97.076731
NDL-324		No	Yes	Mixed	No	b,c	Low	No	Yes	Yes	No	No	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.81	46.521325	-97.075991
NDM-106 NDM-106		No No	Yes Yes	Small Small	No Yes	b,d	Very Low Low	No No	Yes No	No No	No No	No No	No No	Wooded area > 1000 ft forest/wooded area & unconnected Individual trees > 1000 ft to forest/wooded area	Isolated Unsuitable	0.31	46.518646 46.502204	-100.271333 -100.246561
NDL-324	34.61	No	No	Small	No	-	Very Low	No	Yes	Yes	No	No	-	Individual trees > 1000 ft to forest/wooded area	Unsuitable	0.04	46.489091	-97.06138
NDL-324 NDL-324		No No	Yes Yes	Mixed Mixed	No No	b,c b,c	Low	No No	Yes Yes	Yes Yes	No No	No No	No	Wooded area > 1000 ft forest/wooded area & unconnected Wooded area > 1000 ft forest/wooded area & unconnected	Isolated Isolated	0.30 4.24	46.485669 46.481423	-97.061548 -97.061359
NDL-324		No	No	Small	No	- D,C	Very Low	No	Yes	Yes	No	No	No No	Wooded area > 1000 ft forest/wooded area & unconnected  Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	1.04	46.466084	-97.061387
NDL-324		No	Yes	Mixed	No	b,c	Low	No	Yes	Yes	No	No	No No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	4.94	46.460197	-97.062166
NDL-324 NDL-324		No No	Yes Yes	Mixed Mixed	No No	b,c b,c	Low	No No	Yes Yes	Yes Yes	No No	No No	No No	Wooded area > 1000 ft forest/wooded area & unconnected Wooded area > 1000 ft forest/wooded area & unconnected	Isolated Isolated	0.50 1.91	46.452612 46.449761	-97.062295 -97.061113
NDL-324	38.48	No	Yes	Small	No	b	Very Low	No	No	No No	No	No	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	1.77	46.434107	-97.06104
NDM-106		No No	Yes	Small	No No	b	Very Low	No No	Yes	No No	No No	Yes	No No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.42	46.432176	-100.128324
NDL-324 NDL-324		No No	Yes Yes	Small Small	No No	b b	Very Low Very Low	No No	No No	No No	No No	No No	No No	Wooded area > 1000 ft forest/wooded area & unconnected Wooded area > 1000 ft forest/wooded area & unconnected	Isolated Isolated	1.79 0.19	46.429538 46.420049	-97.061376 -97.060642
NDL-324	40.44	No	Yes	Small	No	b	Very Low	No	No	No	No	No	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	10.33	46.405732	-97.060954
NDL-324 NDL-324		No No	Yes Yes	Small Small	No No	b b	Very Low Very Low	No No	No No	No No	No No	No No	No No	Wooded area > 1000 ft forest/wooded area & unconnected Wooded area > 1000 ft forest/wooded area & unconnected	Isolated Isolated	1.00 0.58	46.396294 46.387712	-97.060735 -97.058869
NDM-106		No	No	Small	No	-	Very Low		Yes	No	No	No	No No	Wooded area > 1000 ft forest/wooded area & unconnected  Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	2.48	46.367115	
NDM-106		No	Yes	Mixed	No	b,c	Low	No	Yes	No	No	No	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	1.45	46.361149	-100.001833
NDL-324 NDM-106		No No	Yes No	Mixed Small	No No	b,c	Low Very Low	Yes, road No	No No	No No	No No	No Yes	No No	Wooded area > 1000 ft forest/wooded area & unconnected Individual trees > 1000 ft to forest/wooded area	Isolated Unsuitable	3.24 0.47	46.355915 46.333111	-97.052433 -99.978632
NDM-106		No	No	Small	No	-	Very Low	No	No	No	No	Yes	No	Individual trees > 1000 ft to forest/wooded area	Unsuitable	0.19	46.333036	-99.977378
NDL-324		No No	No No	Large	No No	С	Very Low	No No	No No	No No	No No	No Vac	No No	Individual trees > 1000 ft to forest/wooded area	Unsuitable	0.15	46.332779	-97.040107
NDM-106 NDM-106		No No	No No	Small Small	No No	-	Very Low Very Low	No No	No No	No No	No No	Yes Yes	No No	Individual trees > 1000 ft to forest/wooded area Individual trees > 1000 ft to forest/wooded area	Unsuitable Unsuitable	0.22	46.332291 46.331854	-99.976061 -99.974739
NDM-106	80.76	No	No	Small	No	-	Very Low	No	No	No	No	Yes	No	Individual trees > 1000 ft to forest/wooded area	Unsuitable	0.19	46.331622	-99.97347
NDM-106		No No	No Voc	Small	No Voc	- h.d	Very Low		No No	No No	No No	Yes	No No	Individual trees > 1000 ft to forest/wooded area	Unsuitable	0.28	46.330883	-99.972137
NDL-324 NDL-324		No No	Yes Yes	Small Small	Yes Yes	b,d b,d	Low	No No	No No	No No	No No	No No	No No	Wooded area > 1000 ft forest/wooded area & unconnected Wooded area > 1000 ft forest/wooded area & unconnected	Isolated Isolated	2.43	46.307712 46.301687	-97.040039 -97.03996
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Appendix D

Northern Long-Eared Bat Wooded Areas, Habitat Components, Habitat Type, and Location within the Midwest Carbon Express ESA in North Dakota

Part		Nearest	Wooded	Canopy	Stand	Water < 750n	n Hahitat	Habitat	Human	Wooded Area < 1000 ft	Wooded Area < 2.5 mi	Wooded Area Connected	Wooded Area < 2.5 mi	Wooded Area < 1000 ft		FWS Habitat	Wooded Area		
The Content of the	Route								1	·					Rationale for FWS Habitat Type			Latitude	Longitude
The column   The							_	,											
March   Marc																			
15   15   15   16   16   16   16   16												-							
1.   1.   1.   1.   1.   1.   1.   1.							_												
1.00   1.00																			
1.50   1.50																			
1.00   1.00								,											
19.   10.							_	,											
1971   10   10   10   10   10   10   10	NDL-323	4.25	No	Yes	Small	Yes	b,d	Low	No	Yes	Yes	Yes	Yes	Yes	Suitable connected NLEB habitat	Suitable	0.62	46.203491	-96.746137
Fig.   1.50								. , .											
Fig.   1.5																			
Company   Comp							_												
Section   Sect																			
Street   March   Mar			No	No	Mixed	Yes	c,d	Low	No	Yes	Yes	Yes	Yes	Yes	Suitable connected NLEB habitat	Suitable		46.190379	-97.294646
Section   March   Ma				1															
Section   Color   Co																			
Company   Comp							-,-,-										0.00		
Page																			
Fig. 21   Pol.   Vol.   Mod.		25.94	No	Yes	Small	Yes	b,d	Low	Road	Yes	No	No	No				0.96	46.181415	-97.538397
Miles   1982																			
1877-171   33-30   10   10   10   10   10   10   10							-,-												
Part																			
1984-16   1982							_									Unsuitable	0.21		
1977-11   1970																			
NOT-2011   17.00   No.   Yes   Small   Yes   Sol   Low   No.   Yes   No.   N																			
NOT 2017   St.   Yes																			
NOTIFIED   161   161   162   163				1															
NOT-711   33-28   No		_					_												-97.767734
NOT-211   39.53   No																			
Fig. 17   10   70   70   70   70   70   70							-,-,-												
RDT_211   30.94   No.   Vest   Small   Vest   Vest   No.																			
No.   Per stand 4.3 in Coh   Per stand 4.3																			
NBAME  100   150	NDT-211	40.33	No	Yes	Small	Yes	b,d	Low	No	Yes	Yes	No	No	No	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.29	46.118824	-97.809072
NBM-106  55.31 No							_	,											
NBM-10   55.25   No								,											
NOT-211   49.14   NO   Ves   Small   NO   D   Very Low   Road   Ves   NO   NO   NO   NO   Moded area - 1000 ft forestwooded area & successories and successor							_	,											
NOT-211   50.99   No No   No   Small   Yes   d   Vary Low   Road   No   No   No   No   No   No   No   N								,											
NDT-211   51.07   No No   Small   Yes   d   Very Low   Road   No   No   No   No   No   No   No   N				Yes		No	b	Very Low	Road							Isolated			
NOT-211   S2-10   No								. , .											
NOT-211   51-46   No								,											
NOT-211   51.77   No							_	,											
NDT-211   55.74   No												No		No					
NDT-211   55.19   No	NDT-211	54.55							· · · · · · · · · · · · · · · · · · ·						Wooded area > 1000 ft forest/wooded area & unconnected				
NDT-211   56.75   No   Yes   Mixed   Yes   b.c.d   Moderate   Yes   Yes   No   No   No   No   No   Moded area a 1000 ft brest/wooded area & unconnected   Solated   0.45   46,043302   58,00006   598,102535																			
NDT-211   61.07   No   Yes   Small   Yes   d.   Uev   Low   No   Yes   Yes   No   Yes   No   Wooded area & unconnected   Isolated   0.237   46.000076   -981.162535   No   No   No   No   No   No   No   N																			
NDT-211   64.43																			
NDT-211   68.81   No							_												
NDT-211   68.81																			
NDT-211   66.02 No							_	,											
NDT-211   66.14 No																			
NDT-211   66.49   No   Yes   Mixed   Yes   b.c.d   Moderate   Road   Yes   Yes   No   No   No   Wooded area \$\$\text{\$\te							_												
NDT-211   80.97 No																			
NDT-211   80.20   No   Yes   Small   Yes   b,d   Low   No   Yes   Yes   No   No   No   No   No   No   No   N																			
NDT-211   80.11 No   Yes   Small   Yes   b,d   Low   No   Yes   Yes   No   No   No   No   No   No   No   N																			
NDT-211   76.61   Yes   No   Small   Yes   a,d   Low   No   Yes   No   No   No   Yes   No   No   Yes   No   No   No   Yes   No   No   No   No   No   No   Yes   No   No   No   No   No   No   No   N																			
NDT-211   76.67 No																			
NDT-211         81.96         No         Yes         Mixed         Yes         b,c,d         Moderate         No         No         No         No         No         Wooded area \$ 1000 ft forest/wooded area & unconnected         Isolated         0.05         45.955678         -98.547817           NDT-211         87.19         No         Yes         Small         Yes         b,d         Low         No         No         Yes         No         Yes         No         No         No         Yes         No																			
NDT-211         87.19         No         Yes         Small         Yes         b,d         Low         No         No         Yes         No         Wooded area & unconnected         Isolated         0.17         45.953691         -98.6552           NDT-211         83.44         No         Yes         Small         Yes         b,d         Low         No         Yes         No         No         No         Pure stand < 3 in dbh																			
NDT-211         83.44         No         Yes         Small         Yes         b,d         Low         No         Yes         No         No         Pure stand < 3 in dbh         Unsuitable         0.15         45.953565         -98.577928           NDT-211         83.21         No         Yes         Small         Yes         b,d         Low         No         Yes         No         No         No         Pure stand < 3 in dbh				1															
NDT-211         83.21         No         Yes         Small         Yes         b,d         Low         No         Yes         No         No         Pure stand < 3 in dbh         Unsuitable         0.70         45.953516         -98.573283           NDT-211         89.09         No         Yes         Small         Yes         b,d         Low         No         Yes         Yes         Wooded area > 1000 ft forest/wooded area & unconnected         Isolated         0.19         45.9411         -98.688552																			
NDT-211 89.09 No Yes Small Yes b,d Low No Yes Yes No Yes Wooded area \$ unconnected Isolated 0.19 45.9411 -98.688552																			
NDT-211																			
	NDT-211	89.30	No	Yes	Small	Yes	b,d	Low	Road	Yes	Yes	No	Yes	Yes	Wooded area > 1000 ft forest/wooded area & unconnected	Isolated	0.14	45.939126	-98.691872

Appendix E – Northern Long-Eared Bat Habitat Assessment Locations in North Dakota

