Programmatic Biological Assessment

For Future Transportation Improvement Projects in Nebraska and Their Effects to the American Burying Beetle (FY 2025-2030)

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EXECUTIVE SUMMARY

This Biological Assessment (BA) has been completed to programmatically address Endangered Species Act and Nebraska Nongame and Endangered Species Conservation Act consultation for the American burying beetle (*Nicrophorus americanus*) (ABB) as it applies to federally funded or authorized projects, or state funds only projects with a federal nexus, carried out by the Nebraska Department of Transportation (NDOT) over the next five years. The intent of this BA is to establish a programmatic approach for consultation on ABB for NDOT construction projects from 2025 through 2030. Federal transportation system projects funded through federal dollars and let through NDOT, state funded projects with a federal nexus, and local government projects with federal funds where the National Environmental Policy Act (NEPA) process is being facilitated through NDOT are covered by this programmatic BA.

Authorities. This programmatic BA analyzes proposed actions with the potential to adversely affect ABB, a federally and state threatened species. Adverse effects to a federally listed species or its habitat require consultation with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act (ESA). State listed endangered and threatened species are protected under the Nebraska Nongame and Endangered Species Conservation Act (NESCA), and potential impacts, specifically on projects with new property rights, also require consultation with the Nebraska Game and Parks Commission (NGPC).

Covered Species and Action Area. ABB has well established populations in Nebraska's Sandhills and Loess Canyons regions (Jurzenski et al. 2011, McPherron et al. 2012, Roberts et al. 2025). The Action Area for the purposes of this programmatic consultation includes the known and modeled range of ABB in Nebraska.

Proposed Action. The proposed action includes multiple transportation project types likely to occur in the five-year program. Projects with soil disturbance adversely impact beetles. Projects will utilize proposed avoidance and minimization measures (AMMs) specific to ABB and require compensatory mitigation measures (referred to as conservation pathways). Compensatory mitigation credits will be determined by NDOT using ratios approved by USFWS and NGPC. Conservation bank crediting or in-lieu fee programs would be the preferred conservation pathway; however, other options, such as off-site permittee responsible sites or land management agreements, and applied research, are provided to allow NDOT flexibility in offsetting adverse impacts to ABB. Consequences of the action include private contractor use sites and utility relocations (also sometimes referred to as interrelated and interdependent actions). Acquisition or use of contractor use sites and utility relocations are private actions, but areas of soil disturbance specifically related to project needs become part of that individual project's Action Area and have the potential to adversely impact beetles.

Effects Analysis and Effect Determinations. Construction activities related to transportation projects frequently disturb soil and have the potential to harm individual ABBs. Direct impacts to ABBs could result from clearing vegetation, heavy equipment operation, fuel and chemical contamination of the soil, grading rough terrain, soil excavation and filling, and re-vegetation of disturbed areas. NDOT will utilize individual project evaluations to determine the appropriate effect determination and compensatory mitigation credits. The total acres of soil disturbance in suitable habitat associated with prohibited incidental take for the NDOT five-year program is estimated at 4,087 acres (total includes consequences of the action).

Programmatic Effect Determination. For transportation project types likely to occur in the five-year program, the temporarily and permanently reduced suitable habitat of 6,376 acres (including excepted take) is a relatively small amount (i.e., 0.05%) when compared to the surrounding 13,664,201 acres of suitable habitat within the Action Area. Many individual actions covered by the proposed program will have no effect; many are not likely to adversely affect ABB; and neither the proposed incidental nor intentional take occurs in a single location or point in time. The proposed action would not appreciably reduce the likelihood of survival and recovery of the ABB because AMMs will minimize and compensate impacts to the species.

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I. INTRODUCTION

This Biological Assessment (BA), prepared by the Nebraska Department of Transportation (NDOT) on behalf of the Federal Highway Administration (FHWA), covers federally funded or authorized projects, or state funds only projects with a federal nexus, that are authorized or carried out by NDOT over the next five years (2025-2030). This BA addresses potential impacts to one species, the federally- and state-listed American burying beetle (*Nicrophorus americanus*) (ABB). This programmatic BA contains analyses for the covered species and identifies activities that are likely to result in no effect, may affect but are not likely to adversely affect, or may affect and are likely to adversely affect the species.

A. Authorities

Federally listed endangered and threatened species are protected under the Endangered Species Act of 1973 as amended (16 USC 1531 et seq.). Adverse effects to a federally listed species or its habitat require consultation with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act (ESA). State listed endangered and threatened species are protected under the Nebraska Nongame and Endangered Species Conservation Act (NESCA), and potential impacts may require consultation with the Nebraska Game and Parks Commission (NPGC). NDOT projects, including those authorized, funded, or carried out by a Federal agency such as FHWA, need to address adverse impacts and "take" of listed species through consultation with USFWS under Section 7 of the ESA and NGPC under NESCA.

Section 7 of the ESA requires that, through consultation with USFWS, Federal "actions" do not jeopardize the continued existence of threatened, endangered, or proposed species or result in the destruction or adverse modification of critical habitat. As defined by NESCA, it is unlawful to "take" a species listed as endangered or threatened (Nebraska Revised Statute 37-806); however, NDOT meets the definition of an exempted party associated with transportation infrastructure for existing road, street, highway (or right-of-way [ROW] of a road, street, or highway) and previously approved and utilized contractor use sites (Nebraska Revised Statute 37-812). NESCA does not apply to an exempt party, such as NDOT, for transportation infrastructure projects, unless those projects create new transportation infrastructure in areas not previously dedicated to the exempt party's lawful duties or any subsequent actions that increase the area of existing transportation infrastructure, such as acquiring new ROW or creating new contractor use sites (Nebraska Revised Statute 37-812(2)). Additionally, the exempt party portion of NESCA does not extend to any other state agencies that may have an action that would require consultation (Nebraska Revised Statute 37-812(1)), such as Water Quality Certification or Construction Stormwater Permitting. While NDOT is recognized as an exempt party, they may still choose to consult with NGPC in a good faith effort to conserve Nebraska listed species and to expedite any consultation needs for other state agency actions (Nebraska Revised Statute 37-813).

NESCA has a process similar to Section 7(a)(2) of the ESA to assess and issue reasonable and prudent measures to avoid or minimize adverse effects and/or to provide coverage for incidental take, which would be utilized for 'state funds only' projects with a federal nexus, when applicable. NDOT would provide recommendations to the lead federal agency to utilize this programmatic consultation for ABB, similar to the Nebraska Biological Evaluation Process for all other species. This programmatic BA has identified avoidance and minimization measures

that are intended to not only minimize impacts to ABB to the maximum extent practicable but it also proposes mitigation strategies (also referred to as conservation pathways) to offset unavoidable impacts in compliance with the provisions of ESA and NESCA.

A final 4(d) rule (50 CFR 17.47(d), Federal Register Citation 85 FR 65241) was published for ABB on October 15, 2020 (effective November 16, 2020) (hereafter referred to as ABB 4(d) rule). The ABB 4(d) rule specifies what constitutes prohibited taking of ABB and provides exceptions from take prohibitions. The rule does not remove, or alter in any way, the consultation requirements under Section 7 of the ESA or NESCA. The Intra-Service Section 7 Biological Opinion on the final 4(d) rule (ABB 4(d) BO) (USFWS 2020b) provides a framework for streamlined consultation as an option for federal and non-federal agencies to use. The 4(d) rule applies to three geographic areas of the United States; the Northern Plains Analysis Area includes Nebraska.

B. Consultation History

May 5, 2022	Early coordination with USFWS and NGPC was initiated by NDOT regarding project impacts to ABB. Project materials consisting of a memo, incidental take analysis excel document, and .KMZ file of soil disturbance and habitat suitability were submitted to USFWS, NGPC, and FHWA for review.
May 13, 2022	NDOT, FHWA, NGPC and USFWS held a meeting to discuss a path forward on processing ABB reviews for NDOT projects. At this meeting it was determined projects with soil disturbance in suitable habitat greater than 3.85 acres would result in incidental take being reasonably certain to occur and a "may affect, likely to adversely affect" determination.
February 1, 2023	A virtual meeting was held with NDOT, USFWS, and NGPC to discuss final revisions to a batched Individual Biological Assessment for four NDOT projects (formal consultation). Discussions for future project consultations included the potential for a programmatic consultation.
March 20, 2023	NDOT updated the programmatic agreement with FHWA, NGPC, and USFWS for the Nebraska Biological Evaluation Process (i.e., Matrix Process) for threatened and endangered species reviews for federally funded state and local projects and state funded projects. The programmatic agreement did not include ABB because it would be covered by a separate programmatic agreement in the near future (goal by end of summer 2023).
April 6, 2023	A Kick-off meeting was held with NDOT, FHWA, NGPC, and USFWS to start the ABB programmatic BA process.
April 14, 2023	Notice to Proceed was received for environmental consultant to begin drafting the ABB programmatic BA.
April 20, 2023	A virtual meeting was held with NDOT, FHWA, NGPC, and USFWS to review and discuss draft soil disturbance estimates.

May 18, 2023	A virtual meeting was held with NDOT, FHWA, NGPC, and USFWS to review and discuss proposed AMMs and mitigation measures.
May 25, 2023	Comments were received from USFWS on projects described as part of the proposed action, soil disturbance estimates, proposed AMMs, and proposed mitigation measures.
June 1, 2023	A virtual meeting was held with NDOT, FHWA, NGPC, and USFWS to review a draft of the programmatic BA document for final questions to agencies and input prior to submittal.
June 2, 2023	A draft of the Programmatic BA and four appendices was submitted to FHWA, NGPC, and USFWS to review for final questions and input prior to submittal of the formal consultation initiation package.
July 1, 2023	A revised draft of the Programmatic BA and four appendices was submitted to FHWA to review for review and approval prior to submittal of the formal consultation initiation package.
July 14, 2023	The formal consultation initiation package was submitted by FHWA to NGPC and USFWS to officially start formal consultation.
Sept. 22, 2023	A virtual meeting was held with NDOT, FHWA, NGPC, and USFWS to discuss questions and revisions to the Programmatic BA.
Oct. 5, 2023	A revised Programmatic BA and four appendices was submitted by NDOT (with FHWA approval) to NGPC and USFWS for further review.
Dec. 14, 2023	A virtual meeting was held with NDOT, FHWA, NGPC and USFWS to discuss questions and revisions to the Programmatic BA associated with contractor use sites.
Feb. 16, 2024	A virtual meeting was held with NDOT, FHWA, NGPC and USFWS to discuss conservation pathways and mitigation options.
May 31, 2024	A virtual meeting was held with NDOT, USFWS, and NGPC to discuss potential reinitiation of consultation for the batched Individual Biological Assessment for four NDOT projects (formal consultation). Reinitiation of consultation was discussed to include contractor use sites in soil disturbance estimates.
Oct. 8, 2024	The final Programmatic BA and five appendices were submitted by FHWA to NGPC and USFWS to complete formal consultation.
Oct. 17, 2024	A virtual meeting was held with NDOT, FHWA, NGPC, and USFWS administrators regarding the Programmatic BA submittal and previously

	identified insufficiencies. NDOT and FHWA requested formal comments from USFWS and NGPC on the submitted Programmatic BA.
Nov. 8, 2024	Formal comments from USFWS and NGPC were provided to FHWA and NDOT.
Feb. 4, 2025	A meeting was held with NDOT, FHWA, NGPC, and USFWS regarding revisions to the Programmatic BA submittal.
Feb. 27, 2025	A revised Programmatic BA was submitted by FHWA to NGPC and USFWS for review.
March 7, 2025	A meeting was held with NDOT, FHWA, NGPC, and USFWS regarding revisions to the revised Programmatic BA submittal.
March 20, 2025	A revised Programmatic BA was submitted to NDOT and then FHWA for review and approval.
March xx, 2025	A revised Programmatic BA was submitted by FHWA to NGPC and USFWS to complete formal consultation.

II. COVERED SPECIES

A. Life History

ABB are classified as a carrion beetle within the Silphidae family (also referred to as silphid beetles) and are specifically referred to as a burying beetle, as are all *Nicrophorus* species. It is the largest beetle belonging to the *Nicrophorus* genus in North America, measuring 2.5 to 3.6 centimeters long (**Figure 1**). ABBs can be easily identified by their distinctive orange-red on shiny black coloration. This beetle has distinct orange markings on each elytron (wing covers) and its pronotum (shield-like structure behind the head). The large orange-red marking on the raised portion of the pronotum is a feature shared with no other members of the genus in North America. Additionally, each large antennae tip and portions of the head generally have orange markings. Sexual dimorphism is present within sexes of this species, with male beetles having a large rectangular orange-red facial mark below the frons (a mustache like feature). In contrast, females have a smaller triangular mark.

Figure 1. American Burying Beetle and Other Burying Beetle Species in Nebraska.

Adapted from *The carrion beetles (Coleoptera: Silphidae) of Nebraska*. (Ratcliffe, 1996); Images were resized to show relative size and markings compared to ABB. ABB is depicted on the far left.

ABB is an annual species, typically completing its life cycle in one calendar year. Adults are nocturnal and generally active when above ground temperatures exceed 15°C (60°F). In Nebraska, ABB are most active from late May through early September (also referred to as active season) and bury themselves in the soil daily for refuge and for the duration of the winter. Daily burial depths for individual beetles likely range from just below the surface to at least 20 cm below the surface, which is based on measurements of 12 ABB in a controlled laboratory setting; therefore, it is possible beetles would bury deeper under certain natural conditions (Willemssen 2015). Overwintering beetles in the northern portion of their range appear to bury to a depth at or below the frost line, which can be approximately 25 to 51 cm below the surface (Hoback and Conley 2014).

Most reproductive activity occurs in June and July and largely depends on the availability of appropriately sized carrion. ABB feed upon a variety of dead animals, including birds, fish, mammals, reptiles, and other invertebrates. Specialized sensors on the tip of their antennae assist burying beetles to locate carrion. ABBs select carcasses in which to bury and create a brood chamber to deposit their young. The carrion chosen by the beetle for reproduction is

larger than carrion chosen by other burying beetles with optimum weights between 80 and 200 grams (Holloway and Schnell 1997). Carcass weight is a critical component to successful reproduction; with larger carrion (>100 g) being positively related to the number of young produced (Trumbo 1992).

Males find carcasses at night, soon after it is dark. They then emit pheromones (sex attractants) to attract females. Male and female pairs compete with many other beetles or insects for a carcass, with size generally determining who claims the carrion. Carcasses are buried on the spot or rolled into a ball, carried elsewhere (up to 1 m), then buried, usually before dawn. Carcasses can weigh up to 200 times the weight of a beetle. The beetles move a carcass by lying on their backs and balancing the carcass above them, then walking their legs to move the load forward as if on a conveyor belt (NYSDEC 2009). The depth of carcass burial has had limited research specific to ABB. Based on similar species and anecdotal observations, ABB are likely to construct brood chambers between 7 cm and 60 cm below the surface (Pukowski 1933, Scott 1998, Jurzenski personal observation). This depth would largely be affected by environmental conditions, such as soil type, compaction, and moisture, in addition to the size and relative health of the individual beetles.

An underground brood chamber, an open area allowing for movement of larvae and adults, is constructed around and adjacent to the carcass once it is buried. About two days after burying the carcass, the female lays her eggs in an escape tunnel leading off the brood chamber. One parent, usually the female, stays with the eggs. Larvae hatch in approximately four days and are cared for and fed by adults. This level of parental care is quite rare for a non-social insect. Development of larvae is usually completed in 6 to 12 days, at which time the brood disperses to pupate in the soil nearby. The immature beetles (tenerals) emerge as adults 48 to 60 days later in July and August and then disperse with their parents. The tenerals overwinter in the soil and comprise the reproductive populations the following May or June. The parent beetles (senescents) die off after reproduction or during the subsequent winter.

B. Distribution and Range

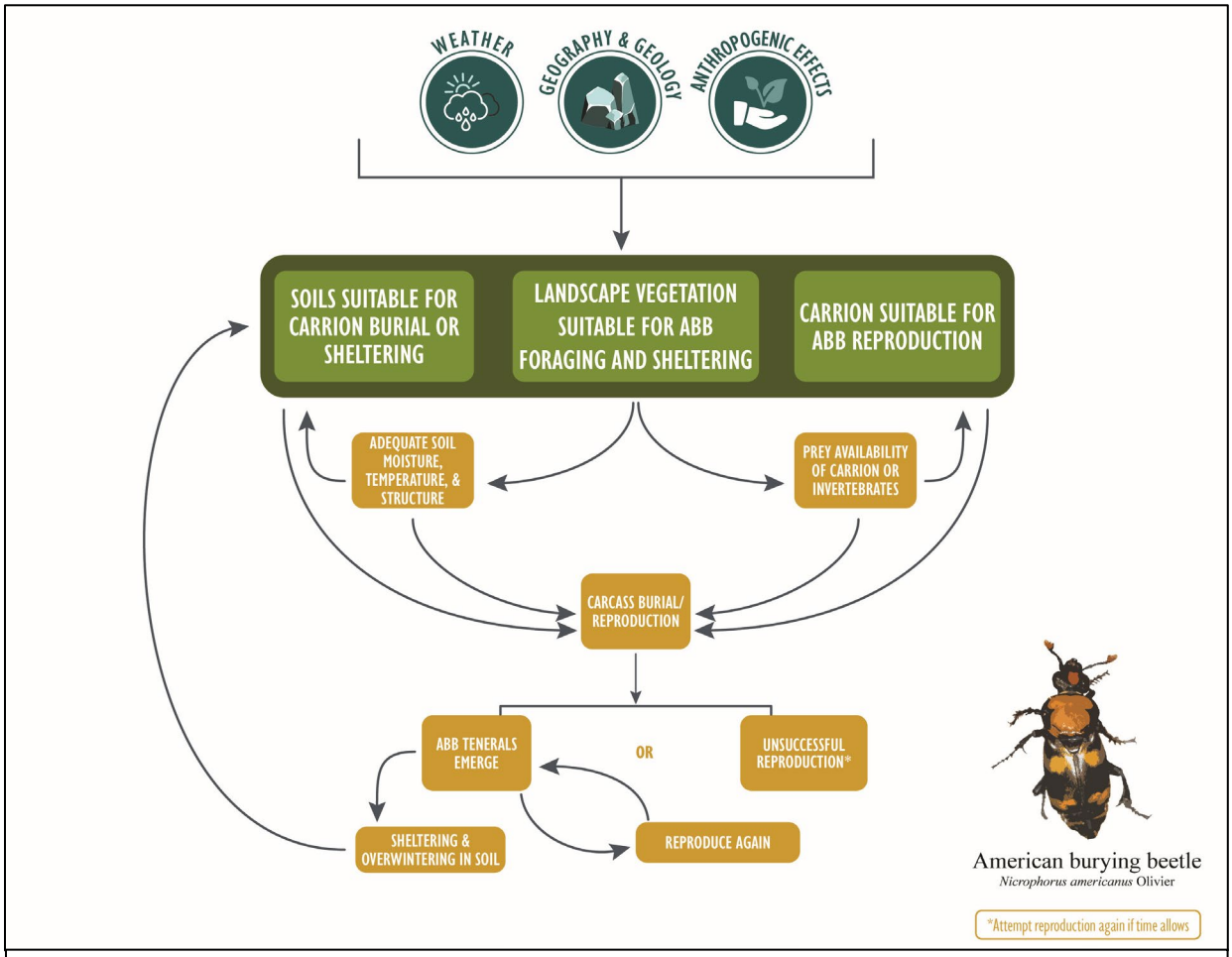
ABB has been recorded historically from at least 150 counties in 35 states in the eastern and central United States, as well as along the southern fringes of Ontario, Quebec, and Nova Scotia in Canada (Lomolino et al. 1995). Since the 1920s, both the range and occupied habitat of ABB has experienced a dramatic reduction (NGPC 2023). It currently occupies less than 10% of its historical range (NatureServe 2023). In the United States, ABB has extant populations in Nebraska, Rhode Island, Massachusetts, Oklahoma, Arkansas, Kansas, Texas, and South Dakota (Anderson and Peck 1985; Lomolino et al. 1995), in addition to areas in Ohio and Missouri where efforts are in progress to re-introduce captive-reared ABB. However, in most states, distribution is localized and patchy (Ratcliffe 1996). No critical habitat has been designated for ABB by USFWS.

Although specific habitat conditions for ABB are unknown due to the broad geographic range formerly occupied by the species, the major ecological factors of any habitat required for the survival and proliferation of ABB are soils, landscape vegetation, and carrion (**Figure 2**). These are each affected by weather, geography, geology, and anthropogenic effects. Habitats in Nebraska where these beetles have been recently found consist of grassland prairie, forest

edge, open woodlands, and scrubland (NGPC 2023). Habitat suitable for ABB reproduction would have carrion of a suitable size for burial and would ideally consist of soils which allow for easier burial of carrion, such as sandy loam, loam, or silt loam (Kozol et al. 1988, Trumbo 1992, Lomolino et al. 1995, Lomolino and Creighton 1996).

Recent habitat suitability models indicate the importance of specific soil types in Nebraska (McPherron et al. 2012, Jurzenski et al. 2014, Jenkins et al. 2018). This result emphasizes the importance of soil characteristics needed for the excavation and deposition of carrion for the completion of the reproductive cycle. The type of landscape vegetation suitable for foraging and sheltering is not specific; however, the diversity, types of strata, and absolute cover of the vegetation impact soil suitability for carrion burial or sheltering (via moisture, temperature, and structure) and the availability of prey suitable for feeding and reproduction. Therefore, important components of good quality habitat for ABB that can be managed involve the quality and diversity of vegetation and limiting adverse anthropogenic effects. Carrion availability (appropriate in size and number) is also an important factor of where beetles could occur.

Figure 2. Major Ecological Factors for ABB.



Adapted from Species Status Assessment Report for the American Burying Beetle (*Nicrophorus americanus*) (USFWS 2019); Credit: Felsburg Holt & Ullevig

ABB has well established populations in Nebraska's Sandhills and Loess Canyons regions (Jurzenski et al. 2011, McPherron et al. 2012, Roberts et al. 2025). In the Sandhills region, ABB are usually captured in areas that naturally retain moisture throughout the summer but are not inundated, such as floodplains, wet meadows, and valleys. ABB could still be captured in drier areas, such as sand dune hilltops and side slopes, but usually in lower numbers; it is likely these captures occur within a reasonable distance (e.g., 1-3 miles) of a wetter area. The Loess Canyons is a relatively small area located southeast of North Platte. In the Loess Canyons region, ABB occurrence is documented in the valleys or canyons, which generally consist of grassland/rangeland, eastern red cedar woodland, and lack row crop agriculture (Bedick et al. 1999, McPherron et al. 2012). Part or all of the following counties are currently included in the ABB range in Nebraska: Antelope, Arthur, Blaine, Boone, Boyd, Brown, Cherry, Custer, Dawson, Frontier, Garfield, Gosper, Grant, Greeley, Hayes, Holt, Hooker, Howard, Keya Paha, Knox, Lincoln, Logan, Loup, McPherson, Lincoln, Logan, Loup, McPherson, Rock, Sheridan, Sherman, Thomas, Valley, and Wheeler.

C. Threats

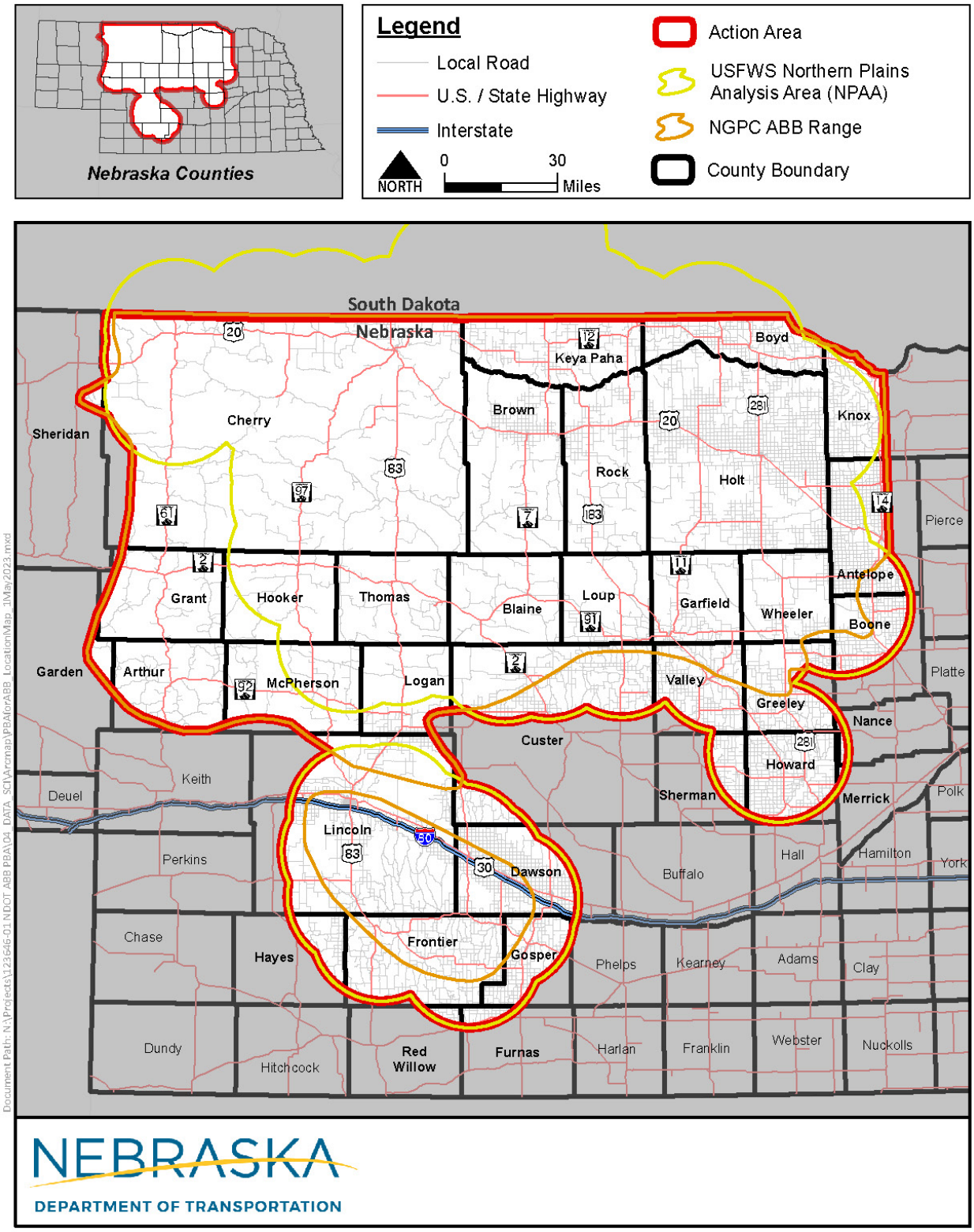
The ABB Recovery Plan (USFWS 1991), 5-year Status Review of the species (USFWS 2008), and ABB Species Status Assessment (USFWS 2019) identify the following factors as potential threats to ABB: direct habitat loss and alteration, increase in competition for or decrease in abundance of prey, inter and intra-specific competition, loss of genetic diversity, disease/pathogens, DDT, agricultural and grazing practices, and invasive species. However, none of these factors alone adequately explain why ABB declined, while congeneric species remained relatively common (Sikes and Raithel 2002). Although much of the evidence suggesting the reduction of carrion resources as a primary mechanism of decline is circumstantial, change in habitat better fits the temporal and geographical pattern of the disappearance of ABBs, and is sufficient to explain why ABBs declined while related species did not. Habitat change could account for (1) reduced carrion prey base of the appropriate size for ABB reproduction, and (2) increased vertebrate scavenger competition for this resource (USFWS 2019).

Current threats to ABB survival and propagation are identified in the ABB Species Status Assessment (USFWS 2019), which specifically covers habitat loss and alteration, availability of carrion, competition with meso-carnivores, inter and intra-specific competition, loss of genetic diversity, disease/pathogens, and other potential risks (i.e., pesticides and artificial lighting). Some extant ABB populations have risks associated with urban development, but most extant ABB populations are in rural areas. Rural areas have increased potential risks associated with agricultural land use. Overall, these threats or risks are likely present or occur within the Action Area but not to the level where substantial losses have been published. However, land use changes like urban expansion and agricultural land conversion to cropland (combined with other risks such as cedar expansion) likely represent the greatest risk to the future viability of the species in the Action Area.

III. ACTION AREA

The Action Area for the purposes of this programmatic consultation includes the known and modeled range of ABB in Nebraska, as defined by NGPC, and the USFWS-designated Northern Plains Analysis Area (NPAA) (as defined in the ABB 4(d) Rule). The NPAA is based on known ABB captures with an 18.6-mile buffer around each capture. The NGPC boundary is based on multiple sources of information, including known ABB captures and a one percent probability of occurrence predicted by a habitat suitability model for the Sandhills Ecoregion (Jorgensen et al. 2014, Jurzenski et al. 2014). Because the NPAA and NGPC boundary are different, the final Action Area boundary is a combination of both areas to cover the greatest area of potential ABB activity and consultation needs. Within the Action Area, the distance of existing roadway (interstate, State highway, and local roads) is approximately 30,901 miles, of which approximately 2,450 miles are within the Nebraska State Highway System. **Figure 3** provides a location map highlighting the boundaries of the Action Area, encompassing 17,362,071 acres across 34 counties in the state of Nebraska. This area includes both urban and rural environments, covering the known and potential habitats of ABB in Nebraska.

Figure 3. Location Map of Action Area.



IV. ENVIRONMENTAL BASELINE

A. ABB Habitat Descriptions and Suitability

USFWS generally determines ABB habitat suitability based on disturbance regime, vegetation structure, soil condition, and carrion availability (USFWS 2019, 2020b, 2020c, 2021). The following discusses generally accepted areas of unsuitable, unfavorable, and suitable habitat for ABB in reference to roadway projects. There is no designated critical habitat for ABB. The specific habitat evaluation for each individual project follows in subsections.

Unsuitable Habitat. Unsuitable habitat for ABB generally includes "land cover types that do not provide habitat that would be favorable for any portion of the ABB life cycle (such as open water or highly developed urban lands)" (USFWS 2019, 2020b). Various sections of the Species Status Assessment (USFWS 2019) provide information about unsuitable habitat. This information is paraphrased as the following: areas permanently inundated with water (e.g., stream or river channels and ponds), paved areas such as asphalt or concrete roadway and driveways, and frequently compacted soil or gravel surfaces such as field access drives and gravel roadways. Urban areas consisting of all paved or hard surfaces and areas lacking vegetation would also be considered unsuitable habitat.

Unfavorable Habitat. Unfavorable habitat for ABB includes areas with frequent disturbance or other characteristics making it unlikely ABB would find adequate food resources and refuge, or suitable breeding conditions. Unfavorable habitat for ABB includes the following areas, as worded in the ABB 4(d) Determination Key Definitions (USFWS 2021a), unless the area has already been classified as unsuitable habitat:

1. Land that is tilled on a regular basis, planted in monoculture, and does not contain native vegetation.
2. Pasture or grassland that has been maintained through frequent mowing, grazing, or herbicide application at a height of 20 cm (8 inches) or less.
3. Land that has already been developed and no longer exhibits topsoil, leaf litter, or vegetation.
4. Urban areas with maintained lawns, paved surfaces, or roadways.
5. Stockpiled soil without vegetation.
6. Wetlands or permanent waterbodies with standing water or saturated soils. Areas adjacent to wetlands and/or riparian areas are not considered unfavorable for the ABB, as they may be important for ABBs seeking moist soils during dry conditions.

NDOT has worked with USFWS and NGPC to further refine the definition of a roadway, as included in #4 above. The roadway as defined in this programmatic BA is the constructed roadway prism from the toe-of-foreslope to the toe-of-foreslope. The roadway prism is exposed to salt from snow removal activities, subject to heavy disturbances or repeated compaction, and is typically mowed multiple times during the growing season, which limits ground cover and decreases soil moisture retention. Similarly, the soil compaction and higher soil salinity leads to difficulty in establishing vegetation on shoulders and down the foreslope (Li et al. 2016).

Compacted roadway foreslopes reduce infiltration rates and soil moisture due to reduced air voids in soil structure. Therefore, roadway foreslopes generally contain drier soils than the bottom of the ditch due to fill material, compaction (as described in the previous sentence), and slope. Within the roadway prism, the increased soil compaction, lower soil moisture, unfavorable soil composition (i.e., increased salinity and decreased organic matter), and altered soil structure likely reduces the ability of ABBs to bury a carcass, and the additional lack of vegetative cover reduces the probability of ABB taking refuge (USFWS 2019). Overall, these characteristics support that the constructed roadway prism from the toe-of-foreslope to the toe-of-foreslope is unfavorable habitat for ABB; paved surfaces within the roadway prism remain unsuitable habitat.

Other unfavorable habitat within the project limits depends on the proximity to, and size or quantity of, unfavorable habitat located adjacent to (but outside) the project limits. The type of unfavorable habitat would also need to be considered (e.g., areas around standing water wetlands are less likely to be called unfavorable). If it is a patchwork of suitable and unfavorable habitat or only one side of the road has unfavorable habitat, then the area should not be considered unfavorable.

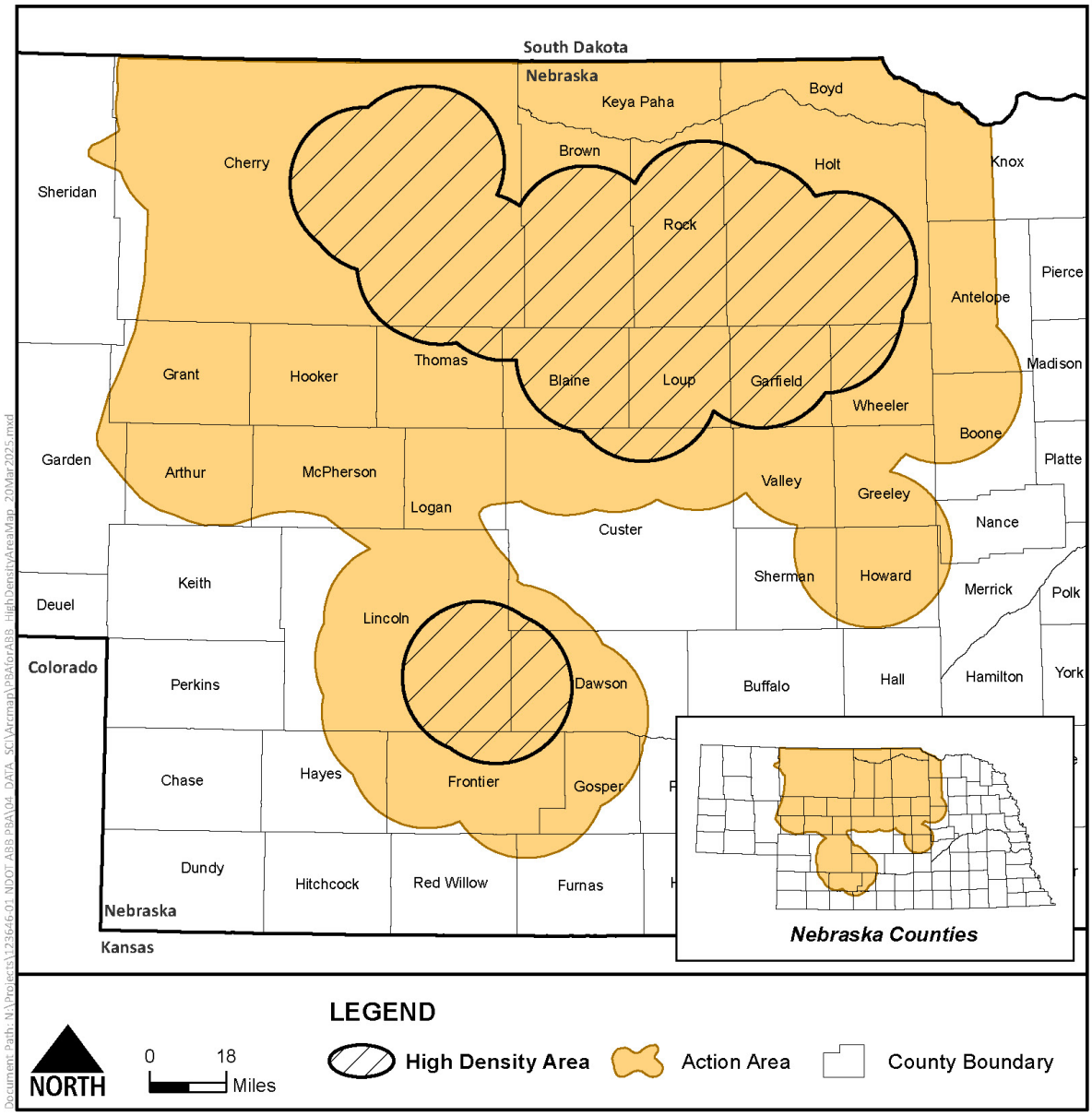
Suitable Habitat. Suitable habitat, as defined by Provisions of the ABB 4(d) rule (USFWS 2020a), are "areas where suitable soils contain the appropriate abiotic elements (e.g., soil temperature, soil moisture, particle size, etc.) that are favorable for excavation and formation of brood chambers and where appropriate carrion for reproduction is available". Most areas outside the toe-of-foreslope are considered suitable habitat (unless they meet the unsuitable or unfavorable descriptions described above). These suitable areas could provide habitat for ABB, support critical portions of the ABB life cycle, or help support potential food resources. For example, areas adjacent to wetlands and/or riparian areas are considered suitable for ABB, as they can be important for individuals seeking moist soil during dry conditions. Variations in the quality of suitable habitat and plant communities are further described in the Land Cover Analysis section (Section IV.C).

B. Status of the Species in Action Area

Grasslands in the Action Area, especially wet meadows in the Sandhills region, support relatively high-density populations of ABB that have high resiliency (USFWS 2020c). According to the ABB 4(d) rule, low percentages of the Action Area are protected, with only one large, protected area that supports significant numbers of ABB. Long-term monitoring via presence/absence surveys in the Loess Canyons has shown a stable, if not increasing, population (Roberts et al. 2025).

The intent of identifying high density areas of ABB based on previous survey efforts is to better locate where conservation efforts could be focused and where higher ratios of mitigation for adverse impacts to ABB should occur. Therefore, a high density area in Nebraska was delineated using sample locations with higher density of ABBs per acre to better predict areas with suitable habitat and anticipated higher ABB capture rates (and densities) (**Figure 4** and **Appendix A**). This high density area includes a portion of the Sandhills Ecoregion and portion of the Loess Canyons Ecoregion. NDOT is proposing the use of the high density area in this programmatic consultation, pending approval by USFWS and NGPC.

Figure 4. Map of ABB High Density Area



C. Land Cover Analysis of Potential Suitable Habitat in Action Area

A high-level estimate of potential habitat suitable for ABB within the Action Area was calculated using the GAP/LANDFIRE National Terrestrial Ecosystems dataset (Davidson and McKerrow 2016). The GAP/LANDFIRE National Terrestrial Ecosystems dataset is produced by the U.S. Geological Survey in collaboration with the LANDFIRE Program and was used to assess habitat suitability in the ABB Species Status Assessment (USFWS 2019). The purpose of this land cover analysis is to identify the percentage of land cover that could be suitable habitat, which was then used to estimate the percentage of suitable habitat within estimated soil disturbance areas (in **Section V**). Map unit land cover types were categorized following the same categorizations as the ABB Species Status Assessment (**Appendix A** of SSA, USFWS 2019); therefore, the roadway

prism as defined in the previous section was not included in defining suitable or unsuitable habitat (as part of this analysis). Any map units that did not correspond to the classifications reported in the ABB Species Status Assessment were visually inspected and classified similarly; however, some areas had no land classification within the dataset. Habitat classifications of favorable, conditional, marginal, and unsuitable ABB habitat are defined in the ABB Species Status Assessment (USFWS 2019); however, because they are based on land cover data these designations will not otherwise be used in this programmatic consultation. **Table 1** provides the acreage of the land classifications by suitability and the percentage of land cover estimated to be suitable habitat for ABB.

Table 1. Habitat Classification of Action Area

AREA	TOTAL AREA (ACRES)	SUITABLE[1] (ACRES)	UNSUITABLE (ACRES)	% OF LAND COVER IS SUITABLE[2]
Action Area	17,362,071	13,664,201	3,635,812	79%

[1]The total of Suitable and Unsuitable acres equals 17,300,013 acres because some areas had no classification in the dataset.

[2]For the purposes of this table, suitable is defined as areas with favorable, conditional, or marginal habitat, per the land cover classifications.

The following descriptions are for the most abundant ecosystem types mapped in the Action Area (Davidson and McKerrow 2016, USGS 2016); habitat classifications per the ABB Species Status Assessment classifications (USFWS 2019) are noted in parentheses:

- Western Great Plains Sand Prairie Grassland (conditional): Sand prairies are dominated by coarse-textured soils and grasses that are well-adapted to this condition. Sand bluestem (*Andropogon halli*) and prairie sandreed (*Calamovilfa longifolia*) are the most commonly found species. Another important feature of these systems is their susceptibility to wind erosion. The largest expanse of sand prairies can be found in the Sandhills Ecoregion of Nebraska.

- Cultivated Cropland (unsuitable): Cultivated croplands include row crop agricultural areas used for production of annual crops and all land being actively tilled. Relative to the Action Area, croplands are most often used for production of corn and soybeans.

- Eastern Great Plains Wet Meadow, Prairie, and Marsh (favorable): These systems are found along creeks and streams, in depressions, or along lake borders. Although they can be adjacent to floodplains, they do not receive regular flooding from streams or rivers. Soils tend to be fine-textured and are often silty, dense clays, or muck. Vegetation in these systems tend to be dense and characterized by species such as prairie cordgrass (*Spartina pectinata*), eastern gamagrass (*Tripsacum dactyloides*), large sedges (*Carex* spp.), and spikerush (*Eleocharis palustris*).

- Central Mixedgrass Prairie Grassland (conditional): The Mixedgrass prairie region contains both tallgrass and shortgrass prairie species, commonly including little bluestem (*Schizachyrium scoparium)* and western wheatgrass (*Pascopyrum smithii*). Other common grasses include sideoats grama (*Bouteloua curtipendula*), big bluestem

(*Andropogon gerardii*), prairie dropseed (*Sporobolus heterolepis*), and needle-and-thread grass (*Hesperostipa comata*). Forb and sedge species can also be common in this system and, in Nebraska, commonly include prairie-clovers (*Dalea purpurea*), prairie coneflower (*Ratibida columnifera*), leadplant (*Amorpha canescens*), and dotted gayfeather (*Liatris punctata*).

- Western Great Plains Depressional Wetland Systems (favorable): Wetlands in this system form in upland and lowland depressions across the western Great Plains. Isolated depression wetlands form in small basins within upland landscapes that are rarely linked to outside groundwater sources and do not have an extensive watershed. Isolated depressions are classified by the presence of an impermeable layer, such as dense clay or hydric soil, and are usually recharged by rainwater. Open depression wetlands form in lowlands, including lake borders and stream margins, and typically have a larger watershed and a more permanent water source throughout the year. Wetter and deeper depressions are commonly dominated by foxtail barley (*Hordeum jubatum*) and spikerush while shallow depressions are dominated by western wheatgrass and buffalo grass (*Bouteloua dactyloides*). Open depression wetlands include cattail (*Typha* spp*.)* and bulrush species (*Bolboschoenus* and *Schoenoplectus* spp.).

- Western Great Plains Shortgrass Prairie (favorable): This system occurs primarily on flat to rolling uplands with loamy soils and is characterized by blue grama. The short grass species that dominate this system tend to be extremely drought and grazing tolerant. In Nebraska, shortgrass prairies are dominated by grasses such as buffalo grass and blue grama (*Bouteloua gracilis)* as well as forbs such as purple locoweed (*Oxytropis lambertii*), prairie coneflower, and scarlet globe-mallow (*Sphaeralcea coccinea*). This system, along with its associated wetlands, represents one of the richest areas for mammals and birds.

- Western Great Plains Floodplain Systems (favorable): This riparian system group is found in the floodplains of medium and large rivers of the Great Plains. These systems are classified by alluvial soils and periodic, intermediate flooding. Dominant communities can range from floodplain forests to wet meadows to gravel/sand flats and are linked to underlying soils and the flooding regime. Dominant species can include big bluestem, sagebrush species (*Artemisia* spp.), little bluestem, woolly sedge (*Carex pellita*), thickspike wheatgrass (*Elymus lanceolatus*), switchgrass (*Panicum virgatum*), western wheatgrass, eastern cottonwood, and American elm (*Ulmus americana*).

D. Roadway Environment

Habitats within roadway ROW, but outside of the roadway prism, vary considerably, ranging from highly disturbed environments to relatively undisturbed natural vegetation, typical of the ecoregion and with similar plant composition as adjacent properties. Because of soil-moving activities, native soil profiles commonly are co-mingled, removing the original layered structure. Maintenance activities such as mowing, tree removal, and weed control alter the roadside vegetation.

The roadway corridor is affected not only by precipitation that falls on it directly, but also by surface water runoff from adjacent properties. This runoff could be irrigation water or storm

flow from adjacent crop fields, or surface runoff from developed or residential properties. This water also has the potential to contain deicing fluids and other contaminants which are present in the environment. Water drains from the ROW via slopes, ditches, and pipes. Typical habitat conditions and features within roadway ROW (but outside of the roadway prism) include, but are not limited to, the following:

Ditch and Backslope. Rural highways with vegetated ditch and backslope are common. The ditch bottom could convey water periodically. Ditch and backslope areas are typically mowed at least once in the growing season. Rural roadsides (i.e., non-state operated) might not be mowed on a scheduled basis.

Urban roadsides in cities and towns have a more manicured appearance because of frequent mowing and landscaping at community entrances. Also, Municipal Separate Storm Sewer System (MS4) regulations may require permanent Best Management Practices for the post-construction settings.

Woodlands. Woodland habitats are possible within the roadway ROW. Likely, most trees were cleared at the time of original road construction. However, some re-colonization by tree species has occurred. Woodland edge habitat can be common. Trees and shrubs are planted periodically in the roadside environment but, because of safety and maintenance concerns, never at densities approaching that of a woodland.

Streams and Rivers. Roadways cross streams and rivers (collectively referred to as channels) using culvert pipes, box culverts, and bridges. Bridge abutments, riverbanks, and streambanks feature vegetated areas with moisture gradients terminating at the roadway prism. Areas near box culverts and culvert pipes could also include habitats that vary in soil moisture, such as herbaceous wetlands, riverbank fringe wetlands, sand bars, and backwater areas. Channel flows could be permanent enough to run all year, at certain times of the year, or only in response to precipitation (i.e., channel flows could be perennial, intermittent, or ephemeral). Transportation agencies also use culverts to direct the flow of run-off and run-on water, independent of mapped stream and river crossings.

Rest Areas. Vegetation and landscaping features in rest areas are generally manicured to provide a visually pleasing oasis. Lawns near the building(s) and parking areas are mowed frequently. Plantings, including trees, could be native or horticultural selections and could depend on irrigation for success. Some NDOT rest areas include walking paths and picnic areas. Edge-of-woodland habitats and areas seeded with native grasses are present at some rest areas.

Maintenance activities. Off-pavement maintenance activities that are associated with the transportation network, but are independent of and not related to the proposed action, are considered past and present actions (as part of the environmental baseline). These include mowing the clear zone several times during a growing season, and the removal of debris from under bridges and within culvert structures. Mowing of the full ROW is sometimes completed once a year. Herbicides could be applied from the edge of the pavement out to the toe-of-foreslope and around guardrails where it is difficult to mow. Additional herbicide spraying could be used to control noxious weeds within the ROW; however, this is not applied to the extent to which it would cause complete removal of vegetation.

E. Past and Present Actions in the Action Area

In the past, portions of the action area have undergone extensive conversion to agricultural. The ABB 4(d) rule recognizes that as much as 5 to 15% of suitable habitat may be adversely affected. Major developments have included conversion of native vegetation to agricultural crops or grazing land, urban or rural development, transportation projects, ROW clearing for utilities, and development of industrial facilities. A biological opinion evaluating the actions of four batched transportation improvement projects and a mitigation site (In Butte and North, Merritt Reservoir North, Lake Maloney South, Wellfleet South, and Bassett Northeast Bank Site) was issued in August 2023. The biological opinion determined that the actions were not likely to jeopardize the continued existence of ABB. NGPC concurred with USFWS's findings.

Wind development projects constructed within the Action Area include the following:

- Valentine Wind, LLC located near Valentine, Nebraska (Cherry County) began operation in 2014 with 1 turbine.
- Ainsworth Wind Energy located near Ainsworth, Nebraska (Brown County) began operation in 2005 with 36 turbines.
- Springview II located near Springview, Nebraska (Keya Paha County) began operation in 2011 with 2 turbines.
- Broken Bow Wind Farms (I and II) located northeast of Broken Bow, Nebraska (Custer County) began operation in 2012 (with additional farm in 2014). These farms have 93 wind turbines, some of which are located within the Action Area.
- Grande Prairie Wind, LLC located near Neligh, Nebraska (Antelope County) began operation in 2016 with 200 turbines.
- Thunderhead Wind located in Antelope, Holt, and Wheeler counties began operation in 2022 with 108 turbines.
- Upstream Wind Energy, LLC located near O'Neill, Nebraska (Holt County) began operation in 2019 with 81 turbines.
- Prairie Breeze Wind Energy Farms (I, II, and III) located near Elgin and Petersburg, Nebraska (Antelope and Boone County) began operations in 2014, 2015, and 2016 with a cumulative total of 179 turbines. Some turbine locations may be outside the Action Area.
- Laredo Ridge Wind Farm located near Petersburg, Nebraska (Boone County) began operation in 2010 with 54 turbines.
- Petersburg, LLC located near Petersburg, Nebraska (Boone County) began operation in 2011 with 27 turbines.

There are some wind development projects under development (but not in the construction phase, as of January 2025) that are likely within the Action Area. Information available from the Nebraska Department of Environment and Energy (NDEE) website for Wind Energy Generation in Nebraska (NDEE 2025) is provided below:

- Cherry County: Nineteen (19) turbines are to be constructed for the Cherry County Wind five miles west of Kilgore.

- Greeley County: NextEra Energy Resources is planning to develop a 40–plus turbine wind farm which will be named the Greeley Wind II, LLC. The project is to be built between Greeley and Scotia.
- Holt County: Construction of 33 to 100 turbines on the Niobrara Wind Farm near O'Neill in Holt County has been proposed.
- Thomas County: A wind farm is planned to be constructed near Thedford.
- Verdigre Wind Farm: The 47–turbine Verdigre Wind Farm near Verdigre in Knox County will be constructed by the Verdigre Land and Wind Partners.

There was one wind energy facility found within the Action Area to be decommissioned, which is described below:

- Nebraska Public Power District installed two turbines near Springview and began operation in October 1998. There were six co–owners: the City of Auburn, the City of Grand Island, KBR Rural Public Power District, Lincoln Electric System, Municipal Energy Agency of Nebraska, and Nebraska Public Power District. The KBR Rural Public Power District operated the turbines. These wind turbines were decommissioned, and the last generation data was reported for August 2007.

The Nebraska Public Power District R-project is a known non-federal project under development in the Action Area and is currently being reviewed for an incidental take permit for ABB.

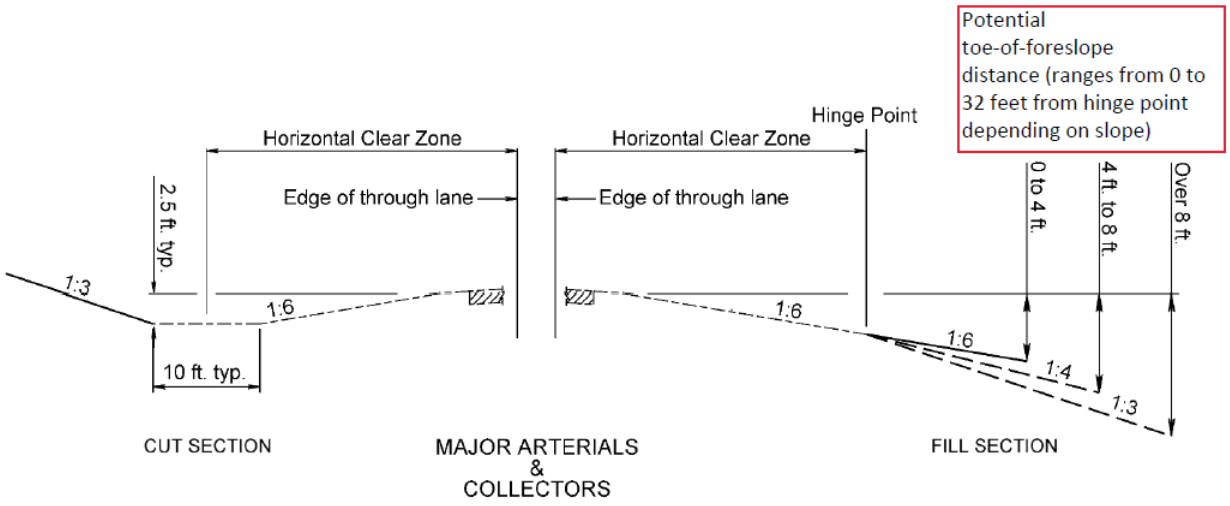
V. DESCRIPTION OF THE PROPOSED ACTION

A. Projects Included in this Programmatic Consultation

The proposed action includes multiple transportation project types likely to occur in the five-year program. Some project types need no further consultation, and some need additional consultation with a local USFWS Field Office and NGPC. Project types included in the proposed action are described below. Projects let through NDOT that are covered by this programmatic consultation include state and federal transportation system projects with federal funding, local government projects with federal funds where the National Environmental Policy Act (NEPA) process is being facilitated through NDOT, and state funds only projects with a federal nexus that is not FHWA. As part of this programmatic consultation process, review of federal-aid eligible local projects would be completed by NDOT or qualified consultants.

Applicable to several project categories described below, the NDOT Roadway Manual (NDOT 2022) provides minimum lane widths varying between 12 and 14 feet wide depending on the functional classification of roadway (i.e., major arterial, collector, local, etc.) and location (e.g., wider driving lanes in the Sandhills region). Shoulder widths also vary by functional class and location but are generally between 4-foot wide turf surfacing and 8-foot wide paved surfacing on each side of the roadway. Paved surfacing is considered unsuitable habitat (see **Section IV.A** for definition of unsuitable habitat). The distance from the shoulder edge to the horizontal clear zone and hinge point varies from 3 feet (designated for local or rural roadways) to 12 feet (for rural major arterial roadways) to 20 feet (for interstate roadways). For the purposes of this programmatic consultation, the definition of a roadway is the constructed roadway prism from the toe-of-foreslope to the toe-of-foreslope (**Figure 5**).

Figure 5. Excerpt from NDOT Roadway Manual Showing Potential Limits of Roadway Prism Relative to the Toe-of-Foreslope (NDOT 2022)



Estimated project limits and acres of soil disturbance are summarized in the below project categories and in more detail in a separate methods and assumptions document (NDOT 2025). The potential adverse impacts of soil disturbance within the project limits are estimated in acres

for each of the following project categories and lighting activities are indicated for corresponding project categories. Construction projects could have accidental spills of petroleum products and chemicals; NDOT's hazardous materials management, Special Provision 116, requires all contractors to submit a Spill Prevention and Control Plan. Removal of animal carcasses has the potential for incidental take; animal carcasses found within the roadway prism and project limits may be disturbed or moved by either large equipment or personnel during the completion of projects as part of this proposed action.

1. Intelligent Transportation Systems (ITS)

Intelligent Transportation System (ITS) projects consist of installing or repair/replacement of infrastructure (i.e., concrete footing, concrete pad, and pole) to mount closed-circuit television (CCTV) cameras, monitors, electronic messaging signs, fiber-optic cables, variable speed advisory sign systems, and other wireless communication technologies to be used as part of ITS. These projects are becoming more commonly proposed by NDOT and LPAs. ITS projects would typically involve soil disturbance beyond the toe-of-foreslope. Some of the ITS projects would include underground utility conduit work.

Construction activities involve clearing and grubbing, earthwork with heavy machinery, permanent surfacing (asphalt or concrete), and lighting. Permanent or temporary erosion control measures may be implemented to re-establish natural areas and minimize habitat degradation (i.e., indirect soil or water impacts). It is assumed all work would occur in potential suitable habitat. Areas of soil disturbance beyond the toe-of-foreslope for each installation are estimated to be around 0.01 acres per project with an additional 0.01 acres per project to account for potential utility work trenching (NDOT 2025b).

Over the next five years, 40 ITS projects are estimated to occur in the Action Area. It is estimated these projects could result in 0.04 acres of temporary impacts and 0.60 acres of permanent habitat loss with a total of 0.64 acres of soil disturbance in suitable habitat (**Table 2**). These projects are estimated to impact 0 (zero) acres of unfavorable habitat within the roadway prism.

2. Site Development

Site Development projects consist of properties developed for compensatory mitigation required for Clean Water Act Section 404 permits, this programmatic consultation for ABB, and for other restoration pursuits or permittee-responsible mitigation. Site Development projects are needed when transportation projects impact environmental resources, such as wetlands or listed species, to the extent that compensatory mitigation is needed to offset the adverse impacts. Prior to alterations, it is possible a property may consist of unfavorable habitat, such as row crop agricultural; however, this evaluation for soil disturbance assumed the entire property originally consisted of potentially suitable habitat. The development for wetland mitigation may include water control structures to promote water retention or manage channel flow. The creation or restoration of wetlands and other habitats would be beneficial to wildlife; therefore,

this programmatic consultation recognizes site development activities consistent with and synonymous with wildlife management activities.

The creation, restoration, or enhancement of channels and wetlands, which may include semi-permanently to permanently inundated palustrine emergent wetlands, could result in unsuitable or unfavorable habitat for ABB; therefore, permanent soil disturbance is estimated at 20% of each development property. This percentage is based on similar projects with habitat mapping completed for early coordination and is documented in a methods and assumptions document (NDOT 2025b). ABB mitigation and other permittee-responsible mitigation consists of the creation, restoration, or enhancement of a variety of habitats (i.e., plant communities to promote a diversity of animals). Land preparation involves clearing and grubbing and earthwork with heavy equipment. Construction activities involve grading to change surface elevations, fencing, and natural plantings. Permanent or temporary erosion control measures may be implemented to re-establish natural areas and minimize habitat degradation (i.e., indirect soil or water impacts). Maintenance or adaptive management activities could include noxious weed control, grazing activities, and prescribed fire. The total area of these projects could range from 120 to 500 acres with estimated areas of soil disturbance ranging from 96 to 400 acres per site (NDOT 2025b).

Surveys would be proposed to monitor ABB occurrence at up to eight future ABB mitigation sites. There could be an estimated 1,400 ABBs (i.e., approximately 10 ABB per trap night at future mitigation sites) captured during surveys or monitoring for up to four years at future mitigation sites. Additional monitoring traps located outside of the mitigation site boundaries could be conducted to enhance knowledge on ABB activity within the area (and would be completed under a Section 10 permit). These traps could capture an estimated 1,120 ABB based on 2 ABB per trap night, which would be greater than the average ABB per trap night (based on the 2011 ABB database references in **Appendix A**). Therefore, a total of 2,520 ABB captures were estimated for these surveys.

Over the next five years, 10 site development projects are estimated to occur on NDOT properties in the Action Area. It is estimated these projects could result in 2,174 acres of temporary impacts and 114 acres of permanent habitat loss with a total of 2,288 acres of soil disturbance in suitable habitat (**Table 2**). These projects are estimated to impact 0 (zero) acres of unfavorable habitat within the roadway prism.

3. Urban

Urban projects consisting of resurfacing, restoration, rehabilitation, reconstruction, or widening of the roadway surface in an urban setting are common projects proposed by NDOT and LPAs. This category includes overpasses, maintenance activities, and other minor roadway improvements. According to the National Geographic Society, urban areas are defined as very developed (i.e., there is a density of human structures such as houses, commercial buildings, roads, bridges, and railways) and can refer to towns, cities, and suburbs. The FHWA Fatality Analysis Reporting System (FARS) also states an urban area is determined by responsible state and local officials in cooperation with each other and approved by FHWA-based Census Bureau criteria. An urban setting lacks

natural plant communities. Ground cover that is not pavement is generally planted turf grass or other manicured landscaping.

Construction activities involve clearing and grubbing, pavement removal, lighting, traffic and pedestrian signals, landscaping, and permanent surfacing (asphalt or concrete). The length of these projects could range from 0.08 miles to 2.7 miles but average estimates were 1 mile per project. Areas of disturbance beyond the toe-of-foreslope, which would likely consist of concrete or manicured landscaping, could range from 0.5 to 25 acres, but average estimates were around 8 acres per project (NDOT 2025b).

Over the next five years, 12 urban projects are estimated to occur in the Action Area. It is estimated these projects could result in impacts to 0 (zero) acres of suitable habitat because the entire Project Action Area would occur entirely in either unsuitable habitat (i.e., paved areas) or unfavorable habitat within and outside the roadway prism (**Table 2**). These projects are estimated to impact 167 acres of unfavorable habitat.

4. Structural Replacements (bridge and culvert replacements)

Structural replacement projects consisting of bridge or culvert replacements are relatively common projects proposed by NDOT and local public agencies (LPAs). Structural replacements are generally constructed on the existing alignment with a detour or are offset adjacent to the existing structures to avoid detouring traffic during construction. These replacements consist of the removal of the structure and replacing it with a new structure that may be wider or longer than the original structure. Bridge replacements may also include the construction of new approaches which can vary in length, depending on the size of the bridge itself. This category also includes construction of overpasses not located in urban areas (see **Section V.A.7**); however, these are relatively uncommon outside of urban areas, and none are anticipated in the five-year program.

Land preparation for bridge construction involves clearing and grubbing (removal of vegetation and roots) of the construction footprint with heavy equipment. Additionally, topsoil is often brought to the construction site to satisfy grade requirements and achieve proper elevation. Permanent or temporary erosion control measures may be implemented to re-establish natural areas and minimize habitat degradation (i.e., indirect soil or water impacts). Rock rip rap is also commonly used below bridge abutments to stabilize topsoil that may be exposed to flowing waters. Concrete footings or abutments and rock rip rap would be considered permanent impacts. Other construction activities may involve lighting, fencing, earth shoulder construction, and temporary crossing/causeway/platforms. These projects would generally be less than 1 mile in total length. Areas of soil disturbance beyond the toe-of-foreslope could range from 0.1 to 10 acres, but average estimates were around 3.1 acres per project (NDOT 2025b).

Over the next five years, 39 structural replacement projects are estimated to occur in the Action Area with approximately half located on major arterial roadways and a quarter on local roads. It is estimated these projects could result in 86 acres of

temporary impacts and 10 acres of permanent habitat loss with a total of 96 acres of soil disturbance in suitable habitat (**Table 2**). These projects are estimated to impact 63 acres of unfavorable habitat within the roadway prism.

5. Pavement Preservation (3R [Resurfacing, Restoration, & Rehabilitation])

Pavement preservation projects consisting of resurfacing, restoration, and rehabilitation of the roadway surface and structures are the most common projects proposed by NDOT and LPAs. This category includes maintenance activities and other minor roadway improvements. Although some pavement preservation projects may not disturb soil beyond the existing edge of roadway, they were included in this category and estimated for potential soil disturbance within and beyond the toe-of-foreslope. Similarly, other pavement preservation projects would not typically involve soil disturbance beyond the toe-of-foreslope but are also included in this category for potential impacts. Some pavement preservation projects may widen the roadway or shoulders to minimum standards (e.g., widen by 2 feet or less on either side) or extend structures beyond the horizontal clear zone, which may cause soil disturbance outside the toe-of-foreslope at spot locations. Structural replacements may be included as part of a pavement preservation project; these structural replacements are not included in the estimates for **Section V.A.1** (Structural Replacements).

Construction activities involve clearing and grubbing, earthwork, permanent surfacing (asphalt or concrete), guardrail installations, trenched widening, lighting, earth shoulder construction, and permanent or temporary erosion control measures. Structural replacements as part of a pavement preservation project would consist of activities described in the Structural Replacement category (**Section V.1)**. The length of these projects could range from 0.3 miles to 36 miles but average estimates were 10 miles per project. Areas of soil disturbance beyond the toe-of-foreslope could range from 0 to 68 acres, but average estimates were around 19 acres per project (NDOT 2025b).

Over the next five years, 100 pavement preservation projects are estimated to occur in the Action Area with most located on major arterial roadways. It is estimated these projects could result in 1,182 acres of temporary impacts and 296 acres of permanent habitat loss with a total of 1,478 acres of soil disturbance in suitable habitat (**Table 2**). These projects are estimated to impact 5,647 acres of unfavorable habitat within the roadway prism.

6. New and Reconstruction

New and reconstruction projects consist of constructing new roadway on new or shifted alignments, reconstructing the roadway surface with additional lanes, or widening a roadway greater than 2 feet on each side (as part of pavement preservation project). These projects require more planning, evaluation/assessment, and cost; therefore, they are less commonly proposed by NDOT and LPAs. New and reconstruction projects would typically involve soil disturbance beyond the toe-of-foreslope. Structural replacements may be included and would consist of activities described in the Structural Replacement category.

Construction activities involve clearing and grubbing, earthwork with heavy machinery, permanent surfacing (asphalt or concrete), guardrail installations, trenched widening, fencing, earth shoulder construction, and lighting. Permanent or temporary erosion control measures may be implemented to re-establish natural areas and minimize habitat degradation (i.e., indirect soil or water impacts). Habitat fragmentation could occur on new alignment projects. The length of these projects could range from 0.7 miles to 15 miles but average estimates were 7.6 miles per project. Areas of soil disturbance beyond the toe-of-foreslope could range from 1 to 145 acres, but average estimates were around 83 acres per project (NDOT 2025b).

Over the next five years, 22 new and reconstruction projects are estimated to occur in the Action Area with most located on major arterial roadways. It is estimated these projects could result in 1,015 acres of temporary impacts and 435 acres of permanent habitat loss with a total of 1,450 acres of soil disturbance in suitable habitat (**Table 2**). These projects are estimated to impact 1,323 acres of unfavorable habitat within the roadway prism.

7. Trails (Transportation Alternatives Program)

Trail projects consisting of the construction of new recreational trails, or the restoration and rehabilitation of existing trails, are relatively uncommon projects proposed by NDOT and LPAs. Recreational trails consist of a 10-foot wide hard surface (i.e., concrete or crushed rock) with the potential of a shoulder up to 5 feet wide. The ROW and project limits would on average be 25 feet from the centerline of the trail alignment. Structural replacements may be included but would be on a smaller scale than described in the Structural Replacement category.

Construction activities involve clearing and grubbing, earthwork with heavy machinery, permanent surfacing (asphalt or concrete), and lighting. Permanent or temporary erosion control measures may be implemented to re-establish natural areas and minimize habitat degradation (i.e., indirect soil or water impacts). Habitat fragmentation may occur on new trail projects. New trail projects would typically involve soil disturbance in the entire area of the project limits and the new trail would have a permanent impact, whereas restoration or rehabilitation would disturb a substantially smaller area along the existing alignment. The length of these projects could range from 1.3 miles to 4 miles but average estimates were 2.5 miles per project. Areas of soil disturbance could range from 4 to 17 acres, but average estimates were around 11 acres per project (NDOT 2025b).

Over the next five years, 5 trail projects are estimated to occur in the Action Area. It is estimated these projects could result in 14 acres of temporary impacts and 6 acres of permanent habitat loss with a total of 20 acres of soil disturbance in suitable habitat (**Table 2**). These projects are estimated to impact 13 acres of unfavorable habitat within an area similar to the roadway prism but scaled down for trail alignments.

Table 2. Project Categories and Estimated Soil Disturbance

PROJECT CATEGORY	NUMBER OF PROJECTS OR LOCATIONS	UNFAVOR. HABITAT (ac)[1]	POTENTIAL SUITABLE HABITAT (ac)[2]	TOTAL SUITABLE HABITAT (ac)[3]	% OF SUITABLE HABITAT LIKELY TO BE DISTURBED	PERM. SOIL DISTURB. TO SUITABLE HABITAT (ac)[4]	TEMP. SOIL DISTURB. TO SUITABLE HABITAT (ac)[5]	TOTAL SOIL DISTURB. TO SUITABLE HABITAT (ac)
ITS	40	0	0.80	0.64	100%	0.60	0.04	0.64
Site Development	10	0	2860	2860	80%	114	2174	2288
Urban	12	167	0	0	0%	0	0	0
Structural Replacement	39	63	121	96	100%	10	86	96
Pavement Preservation	100	5647	9354	7390	20%	296	1182	1478
New and Reconstruction	22	1323	1836	1450	100%	435	1015	1450
Trail	5	13	63	50	40%	6	14	20
Total:	**228**	**7213**	**14235**	**11847**	**-**	**862**	**4471**	**5333**

[1]Unfavorable Habitat: Roadway edge to toe-of-foreslope, except for Urban where unfavorable habitat extends to ROW

[2]Toe-of-foreslope to ROW, except for Urban because they lack potential suitable habitat

[3]Calculated at 79% of land cover is suitable for ABB, except for Site Development, and Urban

[4]Permanent Soil Disturbance as a percentage of the total soil disturbance to suitable habitat: Structural Replacement = 10%; Pavement Preservation = 20%; New and Reconstruction = 30%; Site Development = 5%; Trail = 30%; and ITS = 95%

[5]Temporary Soil Disturbance as a percentage of the total soil disturbance to suitable habitat: Structural Replacement = 90%; Pavement Preservation = 80%; New and Reconstruction = 70%; Site Development = 95%; Trail = 70%; and ITS = 5%

Table 3. Estimated Soil Disturbance for Consequences of the Action

CONSEQUENCES OF THE ACTION	NUMBER OF PROJECTS OR LOCATIONS	SITE ESTIMATE (ac)	TOTAL UNFAVOR. HABITAT (ac)[1]	TOTAL SUITABLE HABITAT (ac)[2]	% OF SUITABLE HABITAT LIKELY TO BE DISTURBED	PERM. SOIL DISTURB. TO SUITABLE HABITAT (ac)	TEMP. SOIL DISTURB. TO SUITABLE HABITAT (ac)	TOTAL SOIL DISTURB. TO SUITABLE HABITAT (ac)
Contractor Use Sites	128	1344	282	1062	84%	170	722	892
Utility Relocations	228	228	48	180	84%	29	122	151
Total:	**-**	**1572**	**330**	**1242**	**-**	**199**	**844**	**1043**

[1]Unfavorable Habitat: Roadway edge to toe-of-foreslope or where unfavorable (and potentially unsuitable) habitat occurs outside the roadway prism.

[2]Calculated at 79% of land cover is suitable for ABB.

B. Consequences of the Action

Interrelated and interdependent actions are consequences of the action and include soil disturbance to suitable habitat associated with private contractor use sites and utility relocations. Acquisition or use of contractor use sites and utility relocations are private actions, but areas of soil disturbance specifically related to project needs become part of that individual project's Action Area. The exception would be soil disturbances at commercial material sites, such as sand and gravel operations, that commercially sell soil and aggregate. Commercial material sites would be exempt because the operation of the sites is not for an individual project and is subject to its own permitting and compliance for environmental regulations. The location and use of sites are at the discretion of the contractor or utility owner and may or may not be specific to projects covered in this Programmatic BA. Contractor use sites are typically negotiated separately from the project and are selected by the contractor. The types of utilities and the methods of relocation vary widely based on the utility involved and the specific project details. Utilities are moved at the discretion of the owner of the utilities and generally do not coincide temporally with the interrelated transportation project. Also, utilities may be relocated onto private property (i.e., not on state or county-owned ROW).

Contractor use sites consist of staging areas, plant sites, access roads, and other offsite areas, such as borrow and waste disposal areas, for project-related activities. Staging areas are used for delivery and storage of construction materials and equipment, contractor office and storage trailers, processing of borrow or waste materials, and employee parking. Office trailers, placed on temporary foundations, are often connected to available utilities as needed. Temporary driveways and access roads could be established from staging areas to the existing roadway. Other offsite areas necessary for roadway projects primarily consist of borrow material and waste disposal sites. Contractor use sites and utility relocations could involve clearing and grubbing (removing topsoil, rocks, and rooted debris), grading to level the site, excavation for utility installation, laying gravel and/or rock over the graded surface, erosion control, and revegetation after completion of associated activities. These areas could use temporary fencing and would be located in close proximity to project construction. Temporary fencing prevents machinery and equipment, materials storage, and construction activity from intruding into adjacent properties or other sensitive areas identified in the project plans.

It is the contractor's and utility owner's responsibility to demonstrate compliance to NDOT by obtaining Section 404 permits or stormwater pollution prevention plan (SWPPP) clearance. NDOT will continue utilizing the Contractor Site Use Request process to approve the location of contractor use sites (NDOT 2025a). This process may be revised pending agreements with agencies. NDOT requires contractors and utility owners to avoid or reduce potential adverse impacts of the proposed action on ABB or its habitat. Contractors will continue to be directed to locate contractor use sites in unsuitable or unfavorable habitat via the proposed avoidance and minimization measure (AMM), **ABB-2**, even if located outside the ROW. NDOT will document when unsuitable or unfavorable habitat is not possible, especially for borrow sites, and acres of soil disturbance to suitable habitat will be documented as part of this programmatic process. NDOT will ensure appropriate mitigation credits are obtained.

Offsite contractor use sites approved by NDOT Roadside Development and Compliance Unit (RDCU) in the last five years were assessed to provide a baseline for potential acres impacted. Approximately 942 acres (or 10.5 acres per project on average) were approved as contractor use sites in the Action Area. Note that not all acres approved were disturbed. To account for variability in the next five years, the number of projects to have newly proposed borrow sites was estimated to be 128 projects (out of the total 228 projects), which would total 1,344 acres of potential soil disturbance. For utility relocations, one acre of impact per project is estimated for these activities, which totals 228 acres of potential soil disturbance. Consequences of the action could potentially disturb 1,572 acres. The estimate of potentially suitable habitat versus unfavorable habitat is based on 79% of overall land cover in the Action Area (Table 1), which calculates to 1,242 acres of suitable habitat. Data to estimate the proportion of suitable habitat that could be impacted is lacking; therefore, a probability density function of a normal distribution with three standard deviations was used to estimate the proportion of acres that would be not impacted, temporarily impacted, and permanently impacted. This normal distribution estimate assumes the average or majority of impacts would be temporary. Based on these assumptions, 16% of the acres of suitable habitat would be expected to have no impacts (i.e., 198 acres), 68% to have temporary impacts (i.e., 844 acres), and 16% to have permanent impacts (i.e., 199 acres).

Over the next five years, 228 projects are estimated to occur in the Action Area, which could require contractor use sites and utility relocations. It is estimated these consequences of the action will result in 845 acres of temporary impacts and 199 acres of permanent habitat loss with a total of 1,044 acres of soil disturbance in suitable habitat (**Table 3**). It is anticipated there would be impacts to 330 acres of unfavorable habitat.

C. Construction Schedules

This programmatic consultation includes construction projects, as defined in **Section V.A**, which may be let for construction through NDOT beginning in 2025 through 2030. The construction season generally occurs from March to November depending on weather conditions. Although some activities could occur during the winter months, they are minimal. New and reconstruction projects and some structural replacement projects are likely to require more than one construction season to complete a project, whereas most other project categories would likely be completed within a single construction season. Urban projects that would otherwise fit the definition of 'new and reconstruction' could also take more than a single construction season.

D. Environmental Commitments and Proposed Avoidance and Minimization Measures (AMMs)

For projects to be covered by this programmatic consultation, specific environmental commitments and AMMs related to ABB would be implemented as described in the following subsections. Other standard NDOT provisions are required for all projects to minimize potential adverse environmental impacts, such as NDOT Special Provision 116 for the accidental spilling of petroleum products and chemicals on a construction site, which requires the contractor to have a Spill Prevention and Control Plan. Conservation conditions and AMMs are communicated to the contractor on each project's letting documents with the 'Status of Environmental Commitments' document (previously called the Green Sheet), which consists of the NDOT

environmental commitments and mitigation identified by the NEPA process and documentation. A contractor bid will not be accepted unless the Status of Environmental Commitments is signed to acknowledge all commitment and mitigation will be satisfied. Implementation of NDOT Environmental commitments is further tracked via a software application used during construction site inspections to ensure commitments are followed. Failure to satisfy the type and timing of each requirement is documented within the database and corrective actions are managed between NDOT representatives and the prime contractor for the project. The following two sections provide environmental commitments that would be implemented prior to project letting.

1. Conservation Conditions for Nebraska Biological Evaluation Process

Conservation conditions implemented with the Nebraska Biological Evaluation Process are assumed to already be in place for any project also being evaluated under the use of this programmatic consultation for ABB (NDOT 2023b, **Appendix B**); therefore, they are applicable as AMMs for ABB but are not fully re-iterated in this programmatic biological assessment. Conservation conditions pertinent to ABB and disturbance to soil in suitable habitat are highlighted, as follows:

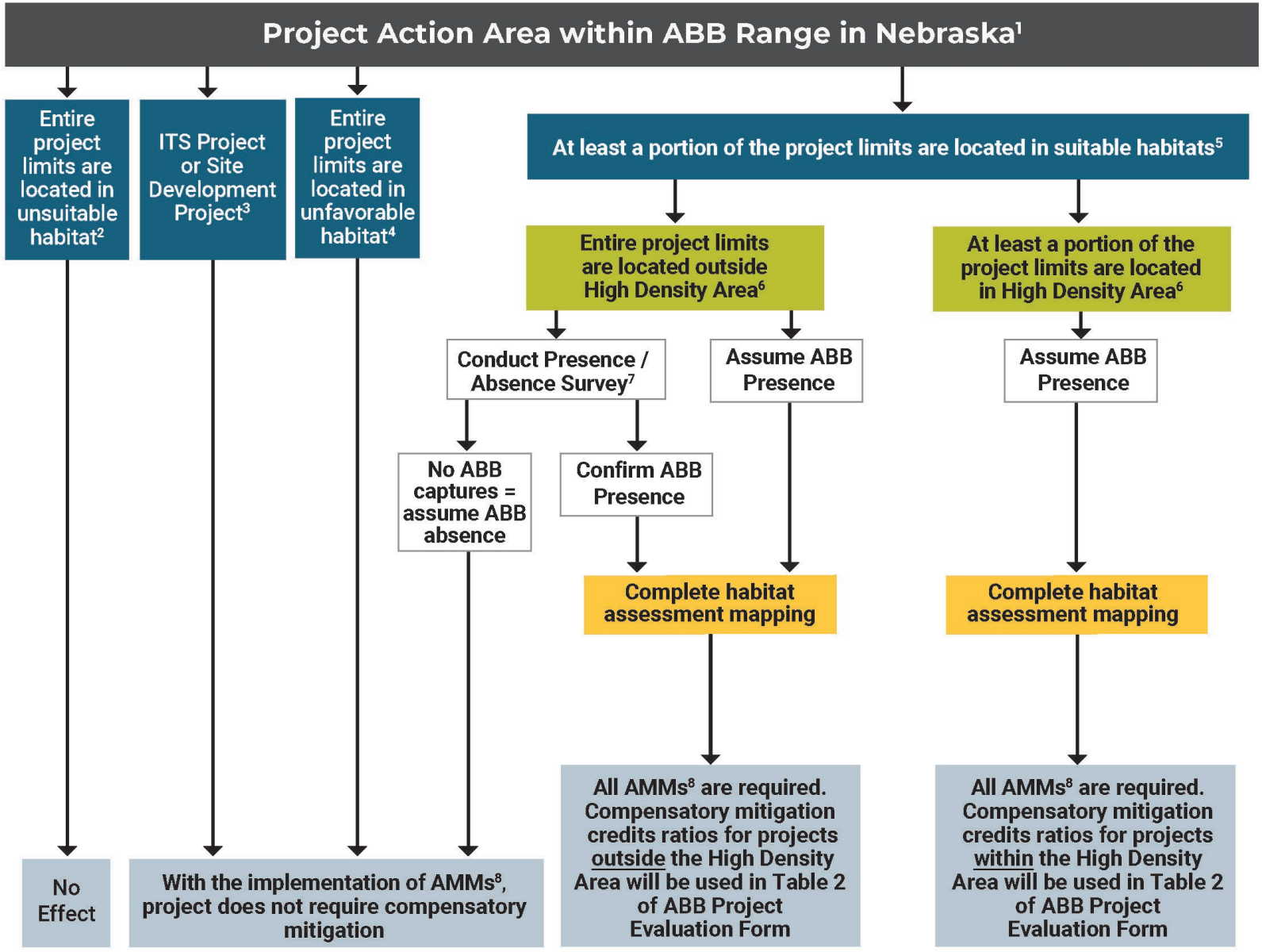
- Temporarily impacted areas of the project would be restored per the NDOT Roadside Vegetation Establishment and Management Plan (NDOT 2023a) and with the implementation of 'revegetation' (**S-3** in **Appendix B**) which involves reseeding. NDOT RDCU actively monitors seedling and vegetation establishment within the first two years after project completion as part of the aforementioned NDOT roadside vegetation plan and to comply with SWPPP requirements. If vegetative cover performance standards (i.e., 75% for **ABB-7**) are not met within the two year timeframe, then the area will be evaluated for adaptive management and re-seeding. Maintenance after vegetative cover performance standards are met continues at the district level and at times requires re-seeding.

2. Habitat Assessment Mapping

Habitat assessment mapping would be used to estimate soil disturbance to suitable habitat as part of individual project reviews. The results of mapping could also serve as a potential tool to avoid or minimize impacts to suitable habitat during design (see **Section VI.B.2**). NDOT, FHWA, USFWS, and NGPC consulted on process documents for early ABB coordination memos, which would continue to be used for the habitat assessment mapping (**Appendix C)**.

As part of individual project evaluations under the use of this programmatic consultation, initial steps require a review of the project type and location within the Action Area (i.e., the combined ABB range for NGPC and USFWS NPAA). This review process is generalized in **Figure 6**. Overall, the aim of this programmatic consultation process is to follow the mitigation hierarchy set out in the USFWS Mitigation Policy, which consists of first considering avoidance, then minimization, and then compensatory mitigation (USFWS 2023b). The following subsections describe proposed AMMs and compensatory mitigation options for the programmatic program.

Figure 6. Process for Individual Project Reviews



[1]The Project Action Area would be determined as part of the first step of the Nebraska Biological Evaluation Process and would be a 1.1-mile buffer if refinements are not necessary. ABB range is defined by the USFWS Information, Planning, and Conservation System (IPaC) and NGPC Conservation and Environmental Review Tool (CERT) or using the combined range, as described by this programmatic consultation.

[2]Unsuitable habitat for ABB includes areas that are permanently inundated with water, paved areas such as asphalt or concrete roadway and driveways, or frequently compacted soil or gravel surfaces such as field access drives and gravel roadways. Urban areas consisting of all paved or hard surfaces and areas lacking vegetation would also be considered unsuitable habitat.

[3]Intelligent Transportation System (ITS) projects consist of installing infrastructure (i.e., concrete footing, concrete pad, and pole) to mount closed-circuit television (CCTV) cameras, monitors, electronic messaging signs, variable speed advisory sign systems, and other wireless communication technologies to be used as part of ITS. Site Development projects consist of properties developed for compensatory mitigation requirements and wildlife management activities.

[4]Unfavorable habitat for ABB includes areas with frequent disturbance or other characteristics making it unlikely ABB would find adequate food resources and refuge, or suitable breeding conditions. Unfavorable habitat for ABB includes the following areas, as worded in the ABB 4(d) Determination Key Definitions (USFWS 2021a), unless the area has already been classified as unsuitable habitat:

1. Land that is tilled on a regular basis, planted in monoculture, and does not contain native vegetation.
2. Pasture or grassland that has been maintained through frequent mowing, grazing, or herbicide application at a height of 20 cm (8 inches) or less.
3. Land that has already been developed and no longer exhibits topsoil, leaf litter, or vegetation.
4. Urban areas with maintained lawns, paved surfaces, or roadways.
5. Stockpiled soil without vegetation.
6. Wetlands or permanent waterbodies with standing water or saturated soils. Areas adjacent to wetlands and/or riparian areas are not considered unfavorable for the ABB, as they may be important for ABBs seeking moist soils during dry conditions.

[5]Suitable habitat, as defined by Provisions of the ABB 4(d) rule (USFWS 2020a), are "areas where suitable soils contain the appropriate abiotic elements (e.g., soil temperature, soil moisture, particle size, etc.) that are favorable for excavation and formation of brood chambers and where appropriate carrion for reproduction is available". Most areas outside the toe-of-foreslope are considered suitable habitat (unless they meet the unsuitable or unfavorable descriptions described below).

[6]The high density area (HDA) is defined by an area with historical ABB densities greater than 0.04 ABB/acre (**Appendix A**).

[7]Presence/absence surveys would follow the most recently approved USFWS Range-wide ABB Survey Guidelines. These surveys would be located outside of the designated high density area (Appendix A) and within areas with data (i.e., previous surveys or habitat modeling) suggesting ABB absence is likely.

[8]NDOT would implement AMMs to avoid and minimize impacts to ABB per the ABB Project Evaluation Form (**Appendix D**). See **Figure 7**.

[9]NDOT would compensate for adverse impacts and potential take of ABB by utilizing one or more conservation pathways, if needed, to meet the requirements of this programmatic consultation. Compensatory mitigation ratios (conserved:affected) for conservation pathways are shown in the below table.

Impact Duration	**Location of Impact**	
	Outside HDA	**Within HDA**
Temporary	0.25:1	0.5:1
Permanent	1:1	1.5:1

3. Required AMMs For "May Affect" Projects in the Action Area

The following AMMs would be required for projects located within the Action Area with a "May Affect" determination. **Figure 7** illustrates when each AMM is applicable within the lifetime of a project.

The intent of **ABB-1** is to minimize direct take through education of on-site construction personnel and is implemented by NDOT Environmental when putting together the Status of Environmental Commitments document.

- **ABB-1** NDOT shall include a factsheet with the NDOT Status of Environmental Commitments focused on identifying the American burying beetle, explaining its life history, current range, and habitat requirements. Information about the legal protections and AMMs shall be included. Construction personnel shall be instructed to report any sightings of American burying beetle or brood chambers if encountered. (NDOT Environmental)

The intent of **ABB-2** is to avoid or minimize soil disturbance in suitable habitat through coordination with the contractor prior to construction starting. This would reduce the probability of incidental take and reduce potential adverse impacts to suitable habitat. This AMM is implemented by NDOT Environmental through the Contractor Site Use Request process (NDOT 2025a). If complete avoidance of soil disturbance in suitable habitat is not possible, then NDOT will document the acres disturbed and determine compensatory mitigation credits, as part of this programmatic process.

- **ABB-2** Contractor use sites (e.g., borrow areas, asphalt plants, and staging areas) shall be located in areas that are frequently disturbed such as, but not limited to, field entrances, crop fields, abandoned roadway, farmsteads, and roads. If this is not possible, the contractor shall coordinate with NDOT Environmental with a site plan showing the desired contractor use site location(s), which shall be sited in such a way as to avoid or minimize soil disturbance in suitable habitat. (Contractor, NDOT Environmental [RDCU])

The intent of **ABB-3** and **ABB-4** is to avoid or minimize soil disturbance in suitable habitat through coordination with design engineers prior to letting and requiring contractors avoid adverse impacts to suitable habitat during construction. This would reduce the probability of incidental take via soil disturbance and reduce potential adverse impacts to suitable habitat. This AMM is implemented by design engineers directed by the NEPA process prior to final design and by contractors directed through the NDOT Status of Environmental Commitments prior to letting (but to be implemented during construction).

- **ABB-3** All phases and aspects of the project shall be modified, to the extent practicable, to avoid soil disturbance in excess of what is required to implement the project safely. Soil disturbance shall be limited to areas specified in the project plans. (Design and Contractor)

- **ABB-4** Erosion and sediment control techniques such as mulching, silt fencing, wattles, and other efforts shall be used to prevent washing away of topsoil, formation of gullies, or other erosion that could negatively affect American burying beetle habitat through the action of surface water. (Design and Contractor)

The intent of **ABB-5** is to avoid attracting ABB into a construction area, which could cause direct harm in the form of incidental take or by drawing beetles away from reproduction opportunities or safer refuge. This would reduce the probability of incidental take and potential adverse impacts to individual beetle's health or fitness. This AMM is implemented by design engineers directed by the NEPA process prior to final design and by contractors directed through the NDOT Status of Environmental Commitments prior to letting (but to be implemented after construction).

- **ABB-5** Nighttime work with lights or temporary construction lighting are not authorized from May 1 to September 30. If nighttime or temporary lighting is requested and approved during this timeframe, then the lighting shall be limited to a Nominal CCT of 3000 +/- 300 K, down shielded (i.e., directional shielding to focus the lighting onto the driving surface), and directed away from suitable habitat. Lighting shall be limited to the extent necessary to meet safety requirements. (Design and Contractor)

The intent of **ABB-6** and **ABB-7** is to minimize adverse impacts to suitable habitat by ensuring only a temporary loss of suitable habitat. This would reduce the probability of potential adverse impacts to ABB populations and minimize loss of habitat. This AMM is implemented by design engineers directed by the NEPA process prior to final design and by contractors directed through the NDOT Status of Environmental Commitments prior to letting (but to be implemented after construction).

- **ABB-6** If the project has a temporary work crossing/causeway/platform for channel work or bank stabilization activities, then implement the following: After completion of construction activities, the contractor shall remove any temporary fill and construction debris from the channel and surrounding uplands. Temporarily disturbed upland or wetland areas shall be reseeded with native seed mix and channel vegetation shall be allowed to recolonize. (Design and Contractor)

- **ABB-7** Areas of temporary soil disturbance shall be restored. Restoration of permanent vegetative cover shall be determined successful when the absolute cover is at least 75 percent. Erosion of the disturbed area shall be equal to or less than the surrounding area when gullying, headcutting, slumping, and deep or excessive filling is not observed. The site shall be free of noxious weeds unless the weeds were present at the site prior to construction or are present in surrounding areas. If the vegetative cover requirement is not met within the two-year monitoring period, then re-seeding and repairs would continue to follow the NDOT guidance until the standards are met. (Design, Contractor, NDOT Environmental)

Figure 7. Proposed Environmental Commitments and AMMs

Prior to Project Letting:

- Habitat assessment mapping would be conducted to estimate soil disturbance to suitable habitat and could serve as a tool to avoid or minimize impacts to suitable habitat.
- ABB-1 NDOT shall include a factsheet with the NDOT Status of Environmental Commitments focused on identifying the American burying beetle, explaining its life history, current range, and habitat requirements. Information about the legal protections and AMMs shall be included. Construction personnel shall be instructed to report any sightings of American burying beetle or brood chambers if encountered.

Prior to Construction:

- ABB-2 Contractor use sites (e.g., borrow areas, asphalt plants, and staging areas) will be located in areas that are frequently disturbed such as, but not limited to, field entrances, crop fields, abandoned roadway, farmsteads, and roads. If this is not possible, the contractor shall coordinate with NDOT Environmental with a site plan showing the desired contractor use site location(s), which will be sited in such a way as to avoid or minimize soil disturbance in suitable habitat.

During Construction:

- ABB-3 All phases and aspects of the project shall be modified, to the extent practicable, to avoid soil disturbance in excess of what is required to implement the project safely. Soil disturbance shall be limited to areas specified in the project plans.
- ABB-4 Erosion and sediment control techniques such as mulching, silt fencing, wattles, and other efforts shall be used to prevent washing away of topsoil, formation of gullies, or other erosion that could negatively affect American burying beetle habitat through the action of surface water.
- ABB-5 Nighttime work with lights or temporary construction lighting are not authorized from May 1 to September 30. If nighttime or temporary lighting is requested and approved during this timeframe, then the lighting shall be limited to a Nominal CCT of 3000 +/- 300 K, down shielded (i.e., directional shielding to focus the lighting onto the driving surface), and directed away from suitable habitat. Lighting shall be limited to the extent necessary to meet safety requirements.

After Construction:

- ABB-6 If the project has a temporary work crossing/causeway/platform for channel work or bank stabilization activities, then implement the following: After completion of construction activities, the contractor shall remove any temporary fill and construction debris from the channel and surrounding uplands. Temporarily disturbed upland or wetland areas shall be reseeded with native seed mix and channel vegetation shall be allowed to recolonize.
- Conservation conditions implemented with the Nebraska Biological Evaluation Process (Appendix B) include 'revegetation' (S-3), which directs re-seeding following construction.
- ABB-7 Areas of temporary soils disturbance shall be restored. Restoration of permanent vegetative cover shall be determined successful when the absolute cover is at least 75 percent. Erosion of the disturbed area shall be equal to or less than the surrounding area when gullying, headcutting, slumping, and deep or excessive filling is not observed. The site shall be free of noxious weeds unless the weeds were present at the site prior to construction or are present in surrounding areas. If the vegetative cover requirement is not met within the two-year monitoring period, then re-seeding and repairs would continue to follow the NDOT guidance until the standards are met.

E. Option to Complete Presence/Absence Survey

As part of individual project review and as a tool to avoid take, NDOT would retain the potential to perform a Presence/Absence Survey following the Range-wide ABB Survey Guidelines (USFWS 2018, or most recent guidance). These surveys would be located outside of the designated high density area (**Appendix A**) and within areas with data suggesting ABB absence is likely (i.e., based on previous surveys or habitat modeling) or a lack of data. NDOT understands surveys must be conducted in the active season and survey results are only valid until the start of the next spring active season (USFWS 2018).

This survey data would be beneficial to studies in refining the ABB range and would contribute to the survival of ABB. Surveys with zero ABB captures would indicate incidental take is unlikely and a habitat assessment to estimate take would not be required. Although zero captures would generally be anticipated given the above parameters, surveys have the potential capture ABB and an estimate is needed to account for potential captures for this programmatic consultation. Surveys would be conducted by individuals with Section 10 recovery permits. NDOT is proposing an estimated 175 ABBs captured during surveys (i.e., approximately 1 ABB per mile for an estimated 25 projects with a total length of 175 miles).

F. Proposed Compensatory Mitigation via Conservation Pathways

The goal for NDOT is to ensure there is a net conservation benefit to ABB for projects requiring compensatory mitigation. This would be accomplished via multiple conservation pathways that would contribute to the propagation and survival of ABB. NDOT would compensate for adverse impacts and potential take of ABB by utilizing any of the conservation pathways below to meet the requirements of this programmatic consultation.

1. Conservation Banks

NDOT may use an ABB conservation bank approved by USFWS and NGPC within the Northern Plains Analysis Area (USFWS 2019). Any individual or group may establish an ABB conservation bank.

2. In-lieu Fee Program(s)

NDOT, federal resource agencies, or conservation groups may develop an in-lieu fee (ILF) program to be reviewed and approved by USFWS and NGPC. The ILF program may have a service area designated at the range-wide, state, regional, or recovery unit level, if approved by USFWS and NGPC. A Program Administrator would receive the compensation fees, administer the ILF program, and be responsible for ensuring that compensation project implementation is consistent with the requirements of the ILF program document.

3. Local Conservation Sites (Off-site Permittee Responsible Mitigation)

NDOT will work directly with the Nebraska USFWS Field Office and NGPC to select specific mitigation sites for individual projects or programs. A mitigation and monitoring plan would be required. The mitigation site should support the recovery and conservation strategy of ABB by protecting suitable habitat in the Nebraska range of ABB, ideally the high density area, and provide a net conservation benefit that contributes toward the propagation and survival of ABB. Site feasibility may require ABB

presence/absence surveys. Monitoring after site construction to meet performance standards may include additional ABB surveys.

a) NDOT Owned Land

NDOT is committed to protecting the mitigation site and ensuring that it provides the intended habitat suitable for ABB in perpetuity. To this end, NDOT would place a Covenant of Dedication (see **Glossary, Section X** for definition) on the site that would protect its habitat suitability via appropriate Deed and Use Restrictions. This would deter development or practices that could handicap the functionality of the site. NDOT shall provide the USFWS and NGPC with a legal description of the land to be preserved, as determined by a registered land surveyor, a draft Covenant of Dedication, and a certified copy of the real estate instruments, recorded with the Nebraska Registrar of Deeds. If a compensation project provides more habitat than required to compensate for a single project's impacts, NDOT may use the excess acres for future projects. This option would require the mitigation plan to establish a ledger to document acres used and remaining acres available.

b) Memorandum of Agreement with Other Agencies/Organizations

NDOT may also choose to enter a memorandum of agreement (MOA) to utilize lands owned by other agencies or organizations for off-site permittee responsible compensatory mitigation, which could include public-private partnerships. This agreement would consist of NDOT enhancing and restoring habitat and providing maintenance for the acres needed to satisfy compensatory mitigation credits or NDOT providing payment (similar to an ILF program) for the associated agency or organization to implement habitat improvements and maintenance to benefit the species. For this conservation pathway, the liability to complete the terms of compensatory mitigation remains with NDOT.

4. Applied Research and Other Site Development

Applied research projects may be included in this conservation program if determined by USFWS and NGPC to be the highest practicable conservation effort available or if the research is expected to provide substantial future conservation benefits. Applied research can yield specific information that will improve some aspects of the compensatory mitigation actions of this programmatic or overall conservation of the species. For example, surveys can be used to identify previously unknown areas with ABB activity or better define the range, or research studies can focus on ways to better protect against incidental take, such as evaluating erosion stabilization matting types and duration (i.e., adverse impacts versus beneficial impacts of re-established vegetation/habitat). Surveys would be conducted by individuals with Section 10 recovery permits. To estimate potential ABB captures, as part of applied research and for the purposes of this programmatic consultation, it is assumed there would be a maximum of two surveys each of the five years of this programmatic consultation (i.e., one survey in June and one survey in August of each year). A survey could consist of up

to twenty traps with an estimated two ABB per trap per survey. Therefore, there would be an estimated 400 ABBs captured during research surveys.

Development of properties not specifically designated as permittee-responsible mitigation sites for ABB, but for compliance with other environmental regulations, such as compensatory mitigation required for Clean Water Act Section 404 permits, could contribute to the net conservation benefit of the species. This would be possible when the development, or wildlife management activities, includes the conversion of unsuitable or unfavorable habitat to suitable habitat within the Action Area.

5. Compensatory Mitigation Credit Ratios

The following compensatory mitigation credit ratios would be used to calculate required credits for ILF programs, conservation banks, or local conservation sites (**Table 4**). For ILF programs, the below mitigation credit ratios would still apply but the program would determine the cost for each credit. NDOT proposes temporarily impacted suitable habitat be mitigated at a minimum ratio of 0.25 acres of mitigation (conserved) for every one acre of temporary impact (affected) (0.25:1) outside of the high density area. A greater compensatory mitigation ratio of 0.5:1 acres (conserved:affected) is recommended for temporarily impacted suitable habitat within the high density area (**Appendix A**). Compensatory mitigation ratios are proposed for temporary impacts due to the potential for incidental take and are suitable compensation because of the following factors:

- Duration of temporary impacts would be for less than five active seasons. NDOT would ensure successful restoration through management by NDOT RDCU and District personnel.
- Loss of ABB individuals or underground broods would not be expected to continue after project completion; therefore, habitat loss would be the only continued adverse effect until full restoration of vegetation. The application of compensatory mitigation is intended to improve or increase population recovery to offset incidental take, especially within the high density area.
- Compensatory mitigation credits in the form of mitigation acres (conserved) would contribute more towards ABB conservation than the impacted acres (affected) based on the diversity of vegetative strata, known ABB presence, and unfragmented contiguous habitat. This landscape approach follows the general policy and principles outlined in the USFWS Mitigation Policy (USFWS 2023b).
- Impacts would occur in patches (geographically and temporally) and most likely in previously disturbed areas. Areas of contiguous habitat set aside and/or improved for compensatory mitigation would more than offset temporary impacts. See **Figure 8** as an illustration of patchy impact areas.
- Conserved acres would occur in areas of known ABB presence rather than assumed presence, which supports the USFWS ESA Compensatory Mitigation Policy to provide in-kind mitigation along with effective siting (USFWS 2023a).
- The area of impact on each project is minor relative to the surrounding available habitat, with the exception of projects in areas with high coverage of row-crop agriculture. Therefore, the temporary loss of patchy and fragmented habitat in a

five-year timeframe would not be expected to have an appreciable adverse effect on the ABB population separate from the initial direct take of beetles. Despite habitat loss being an important threat in the overall decline of the species, available suitable habitat within the Action Area would not be a limiting factor and there is generally adequate surrounding habitat to sustain local ABB populations during the habitat restoration period.

- Temporarily disturbed areas would be reseeded with diverse plant communities largely consisting of native plants, which would be an improvement in some areas compared to pre-project conditions. This is especially true in areas of ROW with non-native monocultures, which occur both within and outside of high density areas (**Appendix A**). In such cases, the restoration would provide a functional lift for ABB and associated prey species in addition to the required compensatory mitigation credits.
- Per the data analysis provided in Appendix A, the greatest ABB density calculated in the dataset was 0.13 ABB per acre. The application of a compensatory mitigation ratio of 0.25 credits for one acre of impact (even outside the high density area) provides a greater offset if directly comparing credits to the ABB density. This appears to be adequate in offsetting not only direct mortality but the longer term loss in potential offspring or decline in local ABB populations.
- Establishing compensatory mitigation credit ratios that are likely to be associated with mitigation lands set aside to protect and manage ABB populations is consistent with recovery tasks 1.23 (i.e., explore all measures necessary to provide long-term protection) and 5.3 (i.e., provide protection and management for additional populations) of the ABB recovery plan (USFWS 1991).

Table 4. Proposed Compensatory Mitigation Credit Ratios

IMPACT DURATION	LOCATION OF IMPACT	
	OUTSIDE OF HDA[1]	WITHIN HDA
Temporary	0.25:1	0.5:1
Permanent	1:1	1.5:1

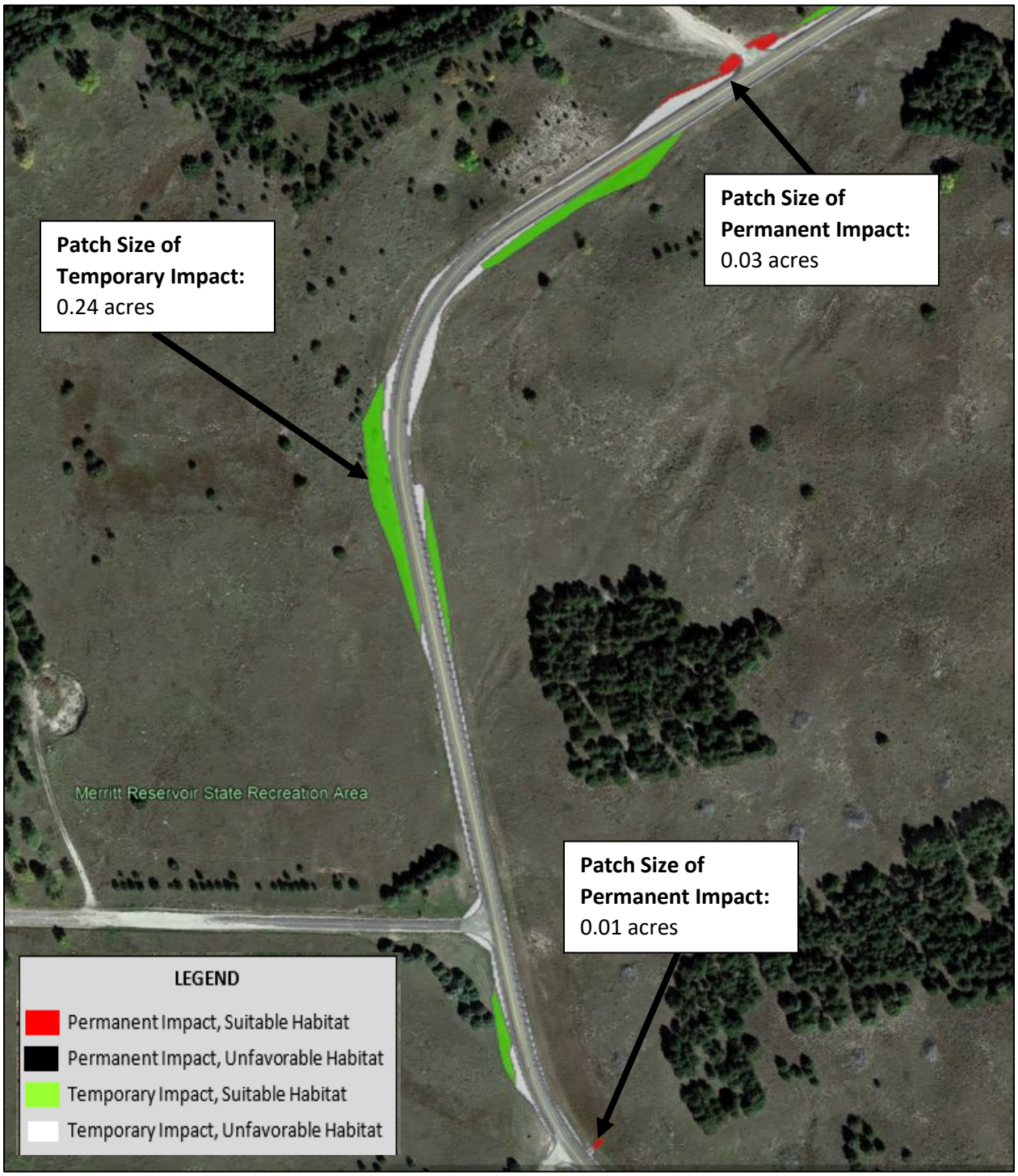
[1]HDA = high density area, as identified in **Appendix A**.

Outside the high density area, NDOT proposes permanently impacted suitable habitat be mitigated at a ratio of one credit of mitigation (conserved) for every one acre of permanent impact (affected) (1:1). The rationale for equal replacement for permanently impacted suitable habitat outside of the high density area is due to similar factors listed for temporary impacts, but also to support a no net loss of suitable habitat and NDOT's wish to be good environmental stewards.

Within the high-density area, NDOT proposes permanently impacted suitable habitat be mitigated at a ratio of one and a half credits of mitigation (conserved) for every one acre of permanent impact (affected) (1.5:1). A higher compensatory mitigation credit ratio is

recommended within the high density area because there is a greater likelihood of ABB occurrence based on historical survey data (**Appendix A**).

Figure 8. Illustration of Impact Locations Within or Adjacent to Previously Disturbed ROW



The best available data to evaluate and recommend compensatory mitigation ratios in Nebraska largely consists of the analysis presented in **Appendix A** and, in some cases, other project evaluations. Other large projects being reviewed for impacts to ABB and not associated with NDOT, such as for the Keystone XL pipeline and NPPD R-Project, are not commensurate comparisons because those projects are or were proposed to occur through large tracts of undisturbed, contiguous suitable habitat for ABB. Therefore, greater compensatory mitigation ratios were appropriate for their proposed impacts. Proposed actions in this programmatic consultation are not likely to create permanently fragmented, disjunct, or isolated habitat because project activities are already located in previously disturbed areas adjacent to the roadway. The exception to this could be contractor use sites; however, these would largely be only temporarily impacted. Additionally, the proposed mitigation credit ratios for suitable habitat are treated the same for varying degrees of habitat quality in an individual project area, whereas some other studies proposed to classify habitat as good, fair, or marginal to reduce the overall credits required (USFWS 2021b). In contrast, NDOT examined the broader landscape and past ABB captures (as a proxy for density) to categorize projects as being within or outside a designated high density area (**Appendix A**). This method provides a more uniform application of offset and would provide an overall greater offset cumulatively than if habitat quality was further parsed out for each individual project.

If a conservation bank, ILF, or 3rd party local conservation site option is chosen to compensate for adverse effects on ABB, then the required number of mitigation credits shall be documented in the yearly tracking spreadsheet (see **Section VII.C**). Cumulative credit purchases or ILF contributions shall occur at the conclusion of each yearly review and be demonstrated on the yearly tracking spreadsheet and annual report. All other required conservation pathways shall be implemented within three years of the associated annual report. This timeframe allows for the purchase and protection of habitats, initiation of restoration and/or enhancement of habitats, research related projects, etc. These conservation ratios are subject to revision with NGPC and USFWS approval for specific conservation pathways, especially for local conservation sites with restoration and management plans.

VI. EFFECTS ANALYSIS AND EFFECT DETERMINATIONS

Construction activities related to transportation projects frequently disturb soil and have the potential to harm individual ABBs. Direct impacts to ABBs could result from clearing vegetation, heavy equipment operation, fuel and chemical contamination of the soil, grading rough terrain, soil excavation and filling, and re-vegetation of disturbed areas. Clearing and grubbing, as well as grading, displaces soil that could uncover ABBs. Uncovered ABBs could be exposed to predation, adverse environmental conditions, or being crushed by equipment. If construction occurs during the active season, ABB broods could be destroyed during soil excavation and adults could be separated from the brood chamber or crushed by equipment. When construction takes place during the winter season, adult individuals could be crushed and/or ABB re-emergence in late spring or early summer could be prohibited. Post construction re-vegetation activities could result in further disturbance. Use of heavy construction equipment, such as bulldozers, excavators, track hoes, and back hoes, could compact soils (Hoback 2016). This could result in destroying ABB brood chambers, including adults and larvae, and preventing use by ABBs for carcass burial during the reproductive season. The accidental spilling of petroleum products and chemicals could contaminate the soil if accidentally spilled, creating unsuitable habitat, and directly killing individuals and/or broods, or displacing individuals to less suitable areas.

Off-pavement maintenance activities completed by NDOT are generally discrete, short-term events and mostly restricted to the roadway prism (i.e., unfavorable habitat). Mowing the full ROW once a year would not be considered soil disturbance because it does not convert the existing land use to a different land use and does not alter the soil temperature, moisture, or compaction to such a level that an area of suitable habitat would become unfavorable. Repeated mowing within the roadway prism would be considered soil disturbance because the continual exposure could alter soil characteristics (i.e., soil temperature, moisture, or compaction) and maintenance of short vegetation meets the definition of unfavorable habitat. Thus, the location of repeated mowing within the roadway prism is already not suitable habitat and potential take or alteration of habitat from mowing activities would not be prohibited (per the ABB 4(d) Rule). Some discrete events would alter minor areas of potentially suitable habitat but would have an insignificant or discountable effect on ABB or its habitat and incidental take would not be reasonably certain to occur.

Temporary impacts are activities that temporarily alter or remove ABB habitat, after which the disturbed area is restored to a condition suitable for ABB use within five years of the original activities. Temporarily impacted areas would be restored with seed mixes largely consisting of native plants and would not convert suitable habitat to unfavorable habitat. Upon completion of project construction, temporarily disturbed habitat would be available as suitable ABB habitat after erosion control cover species are established. However, full restoration to the previous or better conditions may take as long as five years. The restoration period of five years is based on the amount of time in which most grass and shrub dominated cover types could be re-established to an undisturbed state based on the environmental conditions and vegetation types within the Action Area. This period also takes into account there are some types of biodegradable erosion control matting that require up to four years to degrade. Because ABB is a habitat generalist that does not require a specific vegetation type, most grassland cover types and native grasses and shrubs would support ABB and associated prey. In some circumstances, restoration from a non-native monoculture in areas of the ROW to a diversity of grasses and forbs would provide a functional lift in habitat quality. Native warm season grasses can take several years to get established, but previous research suggests that 5 years is a realistic timeframe for

restoration of these areas (USFWS 2015). Because of the high reproductive potential of ABB, ABB and associated prey are expected to repopulate temporarily impacted areas once project areas are restored.

Permanent impacts are those that eliminate ABB habitat (e.g., conversion to a hard surface such as adding pavement, flume structures, gravel, or placement of riprap; installation of buildings, roads, or permanently inundated wetlands), as well as any impact to habitat that that takes more than five years to re-establish as suitable for ABB use. Suitable habitat that would be modified and included within the proposed toe of foreslope was also designated as a permanent impact because it would be a conversion from suitable habitat to unfavorable habitat.

ABB can be indirectly affected by limitation or reduction in available carrion via the loss, fragmentation, and alteration of suitable habitat. Removal of vegetation may cause habitat degradation, a reduction of habitat connectivity, a loss of future breeding and sheltering habitat, and an increase in edge habitats. Competing scavengers often thrive in edge habitats and could increase competition for prey resources. Other indirect effects would be minimal as projects are not expected to result in long-term changes in land use, population density, or growth that would indirectly affect ABB or its habitat.

For the purposes of this programmatic consultation, prohibited incidental take pertains to proposed soil disturbance in suitable ABB habitat. The 4(d) rule also prohibits all intentional take of ABB. Intentional take of ABB, such as capturing for research, would not be excepted under the ABB 4(d) rule and would require a section 10 recovery permit or separate project-specific Section 7 consultation. "Non-prohibited take" or “take not prohibited” refers to activities or actions that are not explicitly prohibited or restricted by regulations or rules regarding the conservation or protection of a specific species. In the context of the provided text, it refers to activities that do not violate the rules outlined in the 4(d) rule for ABB. “Excepted take” or “exceptions to take prohibitions” refers to activities that would be prohibited but were listed as an exception from prohibitions in the ABB 4(d) rule. The following represent activities where incidental take is not prohibited under the 4(d) rule:

- The definition of suitable habitat excludes unfavorable habitat; therefore, incidental take caused by soil disturbance in unfavorable habitat is not prohibited.
- Incidental take not associated with soil disturbance is not prohibited.

For the purposes of this programmatic consultation, exceptions to take prohibitions, per the ABB 4(d) rule, include the following activities conducted in Nebraska (additional exceptions evaluated in the ABB 4(d) BO but not pertinent to this programmatic consultation can be viewed in the **Glossary, Section X**):

- Incidental take of ABB resulting from wildlife management activities conducted by federal or state government agencies, such as habitat restoration or prescribed fire to minimize noxious weeds, is excepted from prohibitions. Incidental take of ABB resulting from prescribed burning is also excepted from prohibitions, if associated with wildlife management activities, as evaluated by the ABB 4(d) BO.
- Incidental take of ABB resulting from ranching and grazing activities is excepted from prohibitions.

NGPC has the ability to adopt the ABB 4(d) Rule and follow similar exceptions to prohibited take; NGPC is allowed to adopt stipulations in 4(d) rules under Nebraska Revised Statute 37-803(3). This would allow the ABB 4(d) Rule exceptions to take prohibitions to apply in all areas of the Action Area. FHWA and

NDOT will be assessing all forms of take, including prohibited, non-prohibited, and exceptions to non-prohibited, as a result of NDOT projects in this programmatic BA.

A. Actions That Will Have No Effect on ABB

There are two primary ways that projects can result in "no effect" to ABB: 1) geographic location; or 2) absence of suitable or unfavorable habitat (i.e., entirely located in unsuitable habitat). Projects located entirely in urban settings, as described in the Urban Projects section, could have no suitable habitat; however, some urban project areas could contain unfavorable habitat and would be included in the next section for the potential to 'may affect'. If the project is not within the Action Area or entirely located in unsuitable habitat within the project limits, then the project will result in "no effect" to ABB or its habitat.

B. Actions That May Affect, Not Likely to Adversely Affect (NLAA) ABB (Take Not Anticipated)

For ITS projects or projects assuming ABB absence based on presence/absence surveys, AMMs are required and are expected to reduce the potential impacts of the proposed action on ABB or its habitat. Habitat assessment mapping is not required for projects meeting these conditions (see **Figure 6**). Application of the ABB 4(d) rule is not needed. The following bullets describe how these project conditions qualify as insignificant or discountable impacts:

- Soil disturbance to suitable habitat for all anticipated ITS projects is less than one (1) acre and incidental take is not reasonably certain to occur (**Table 5**). All soil disturbance was assumed to occur in suitable habitat.
- The lack of ABB captures in a presence/absence survey following USFWS survey guidelines (i.e., appropriate use of control traps to reduce false negatives) indicate incidental take is not reasonably certain to occur due to assumed absence of the species.

With the implementation of AMMs, potential adverse effects would be reduced to levels that are insignificant or discountable; therefore, these projects may affect but are not likely to adversely affect (NLAA) ABB or its habitat.

Table 5. Estimated Soil Disturbance Impacts When Take is Unlikely (NLAA)

PROJECT CATEGORY	SOIL DISTURBANCE TO SUITABLE HABITAT (ac)		TOTAL SOIL DISTURBANCE TO SUITABLE HABITAT (ac)
	NOT HDA	HDA[1]	
ITS	0.32	0.32	0.64

[1]HDA = high density area, as identified in **Appendix A**.

C. Actions That May Affect, Likely to Adversely Affect (LAA) ABB

1. Likely to Adversely Affect (Excepted Take and Non-Prohibited Take Assumed)

Site Development projects (all of which would be considered wildlife management activities) would have the potential to disturb 2,288 acres of suitable habitat (**Table 6**). Relative to soil disturbing activities proposed for future mitigation sites, the ABB 4(d)

rule excepts prohibited incidental take associated with wildlife management activities for state agencies, such as NDOT. Therefore, this incidental take is excepted and does not need to be mitigated. Also, ecological functions or habitat characteristics would provide a "net conservation gain" at potential future mitigation sites.

The ABB 4(d) rule acknowledges incidental take is prohibited only in suitable habitat when the take is the result of soil disturbance. Therefore, incidental take in unfavorable habitat, which does not meet the definition of suitable habitat, is not prohibited. The adverse impacts are generally considered discountable (i.e., take is unlikely to occur) and insignificant (i.e., the loss or alteration of habitat is so small it would be negligible and not rise to the level of take) in unfavorable habitat. If incidental take would occur in unfavorable habitat, then it is considered non-prohibited take under the ABB 4(d) rule **(Table 6)**. Projects located entirely within unfavorable habitat would not require habitat assessment mapping. Quantification of disturbed soil (in unfavorable habitat) in individual project reviews could be estimated using the length of the project and the greatest distance from the edge of the roadway surface to the toe-of-foreslope. The following project categories would likely be included in this determination:

- Urban projects that are located entirely within unfavorable habitat.
- Some Structural Replacement, Pavement Preservation, New and Reconstruction, and Trail projects that are located entirely within unfavorable habitat.

AMMs are required for all projects with excepted take or where non-prohibited take is assumed (and prohibited take is not anticipated). AMMs are expected to reduce the potential impacts of the proposed action on ABB or its habitat. Therefore, the following determinations of effect would be appropriate.

With the implementation of AMMs and future beneficial effects to ABB survival and propagation, potential adverse effects would be reduced but incidental take could occur; therefore, site development projects may affect and are likely to adversely affect (LAA) ABB or its habitat. However, these projects would be consistent with wildlife management activities analyzed in the ABB 4(d) BO for the ABB 4(d) rule and take that occurs as a result of a Site Development project is excepted under the ABB 4(d) rule. Compensatory mitigation would not be required.

With the implementation of AMMs, potential adverse effects would be reduced for projects located entirely within unfavorable habitat, but incidental take is assumed possible in unfavorable habitat (for the purposes of this programmatic consultation); therefore, these projects may affect and are likely to adversely affect (LAA) ABB or its habitat. However, incidental take that occurs in unfavorable habitat is not prohibited under the ABB 4(d) rule. Compensatory mitigation would not be required.

Table 6. Estimated Soil Disturbance Impacts for Exceptions to Take Prohibitions and Non-Prohibited Take

PROJECT CATEGORY	SOIL DISTURBANCE TO UNFAVORABLE HABITAT (ac)		TOTAL SOIL DISTURBANCE TO UNFAVORABLE HABITAT (ac)	SOIL DISTURBANCE TO SUITABLE HABITAT (ac)[2]		TOTAL SOIL DISTURBANCE TO SUITABLE HABITAT (ac)
	NOT HDA	HDA[1]		NOT HDA	HDA	
Site Development[3]	-	-	-	592	1696	2288
Urban	79	88	167	-	-	-
Structural Replacement	34	29	63	-	-	-
Pavement Preservation	3065	2582	5647	-	-	-
New and Reconstruction	692	631	1323	-	-	-
Trail	0	13	13	-	-	-
Total:	**3870**	**3343**	**7213**	**592**	**1696**	**2288**

[1]HDA = high density area, as identified in **Appendix A**.

[2]Soil disturbance to suitable habitat for Structural Replacement, Pavement Preservation, New and Reconstruction, Trail, and Urban projects is covered in Section VI.C.3 for prohibited incidental take.

[3]Site Development projects are mitigation activities and therefore fall under the description of wildlife management activities in the 4(d) rule, which are excepted from prohibited take.

2. Likely to Adversely Affect (Prohibited Intentional Take)

Presence/Absence surveys proposed to monitor ABB occurrence at a Site Development project (as required for compensatory mitigation), to provide data as part of an Applied Research conservation pathway, or as part of an individual project's review for ABB impacts would be considered intentional take of ABB. Therefore, captures and handling of ABB individuals are included as potential direct effects. The estimated ABB captures for these activities are 3,095 ABB individuals (**Table 7**).

Table 7. Estimated Intentional Take for Presence/Absence Surveys

SURVEY CATEGORY	ESTIMATED ABB CAPTURES[1]	ESTIMATED ABB MORTALITIES	TOTAL INTENTIONAL TAKE
Site Development Monitoring	2520	56	2576
Applied Research	400	10	410
Project Review	175	4	179
Total:	**3095**	**70**	**3165**

[1]These captures do not include the estimated ABB mortalities.

An estimate of 70 ABB mortalities (i.e., approximately two per year per monitoring site or 2% of ABB captures for applied research and project reviews) is provided as an adequate overestimate based on previous experience of incidental ABB mortalities

during surveys over the last 14 years (Section 10 permits: TE045150-0 and ES09941B-4). Although this does not occur often, it is prudent to estimate up to two mortalities each year per monitoring site due to unforeseen circumstances associated with the trapping conditions (e.g., extreme numbers of silphid beetles competing for the bait or disturbance by ants, predator, or scavenger), extreme weather conditions, or consumption by incidental predator captures in traps, such as shrews (J. Jurzenski personal communication). Sometimes the cause of mortality is not known until after an initial mortality and some situations cannot be predicted or avoided beforehand.

The estimate of 56 mortalities out of 2,520 ABB for monitoring sites equals approximately 2%, which was used to estimate mortalities for applied research or project reviews. These surveys are more likely to occur in areas with low to zero density of ABBs, whereas Site Development projects are more likely to be placed in areas with high densities of ABB. Therefore, fewer mortalities, if any, would be likely for each project review survey.

Intentional take is reasonably certain to occur; therefore, these activities may affect and are likely to adversely affect (LAA) ABB. However, these activities will be part of individual project reviews and will also be conducted by individuals with Section 10 recovery permits.

Table 8. Estimated Soil Disturbance Impacts for Prohibited Incidental Take

PROJECT CATEGORY	PERMANENT SOIL DISTURBANCE IN SUITABLE HABITAT (AC)		TEMPORARY SOIL DISTURBANCE IN SUITABLE HABITAT (AC)		TOTAL SOIL DISTURBANCE IN SUITABLE HABITAT (AC)
	NOT HDA	HDA[1]	NOT HDA	HDA	
Structural Replacement	5	5	47	39	96
Pavement Preservation	160	136	641	541	1478
New and Reconstruction	228	207	531	484	1450
Trail	0	6	0	14	20
Total:	**393**	**354**	**1219**	**1078**	**3044**

[1]HDA = high density area, as identified in **Appendix A**.

3. Likely to Adversely Affect (Prohibited Incidental Take)

For projects where prohibited incidental take of ABB in suitable habitat is likely, AMMs are required and are expected to reduce the potential impacts of the proposed action on ABB or its habitat. Structural Replacement, Pavement Preservation, New and Reconstruction, and Trail projects could be included in this determination (**Table 8**). The total estimated soil disturbance in suitable habitat totals 3,044 acres.

Incidental take would be reasonably certain to occur and unavoidable even with the implementation of AMMs; therefore, these projects may affect and are likely to

adversely affect (LAA) ABB and its habitat. Incidental take in suitable habitat is prohibited by the ABB 4(d) rule. NDOT will be responsible for documentation of impacts and completion of conservation pathways. An example table for calculating compensatory mitigation credits is provided (**Table 9**). This example assumes that the project is located wholly or partially within the high density area.

Table 9. Example Table for Impacts and Compensatory Mitigation Credit Ratios

MOCK PROJECT LOCATED *WITHIN* HIGH DENSITY AREA	**SOIL DISTURBANCE (ACRES)**	**COMPENSATORY MITIGATION CREDIT RATIO (CONSERVED: AFFECTED)**	**COMPENSATORY MITIGATION CREDIT REQUIRED**
Temporary Impacts to Unfavorable Habitat	10.00	-	-
Permanent Impacts to Unfavorable Habitat	4.00	-	-
Temporary Impacts to Suitable Habitat	4.00	0.5:1	2.00
Permanent Impacts to Suitable Habitat	2.00	1.5:1	3.00
Total Acres of Soil Disturbance to Suitable Habitat	**6.00**	-	-
Total Credits of Compensatory Mitigation			**5.00**

D. Actions That May Affect ABB Post-Letting

For the purposes of this programmatic BA, consequences of the action (i.e., interrelated and interdependent actions) with soil disturbance in suitable habitat would be prohibited incidental take. The contractor or utility owner would be responsible for coordinating with NDOT, who would complete consultation to determine adverse effects and an effect determination would occur at that time. NDOT would ensure the contractor or utility owner provides the appropriate compensatory mitigation. Incidental take associated with soil disturbance in suitable habitat is prohibited by the ABB 4(d) rule and NESCA. However, NESCA would not apply to contractor use sites previously approved by NDOT prior to July 19, 2024 (i.e., Nebraska Revised Statute 37-812).

Table 10. Estimated Soil Disturbance Impacts for Prohibited and Non-Prohibited Incidental Take Post-Letting

TYPE OF INCIDENTAL TAKE	**SOIL DISTURBANCE IN UNFAVORABLE HABITAT (AC)**		**PERMANENT SOIL DISTURBANCE IN SUITABLE HABITAT (AC)**		**TEMPORARY SOIL DISTURBANCE IN SUITABLE HABITAT (AC)**		**TOTAL SOIL DISTURBANCE IN SUITABLE HABITAT (AC)**
	NOT HDA[1]	**HDA**	**NOT HDA**	**HDA**	**NOT HDA**	**HDA**	
Prohibited	n/a	n/a	103	96	455	389	1043
Non-Prohibited	172	158	n/a	n/a	n/a	n/a	n/a

[1]HDA = high density area, as identified in **Appendix A**.

The estimated soil disturbance to suitable habitat to be documented post-letting is 1,043 acres (**Table 10**). Prohibited incidental take of ABB is unlikely to occur for utility relocations because the soil disturbance in suitable habitat is likely to be minor on individual projects; however, the estimated soil disturbance to suitable habitat for these actions are included.

E. Cumulative Effects

The number of acres affected in the Action Area by non-Federal nexus projects is undeterminable. These projects could include local government road construction, residential development, agricultural land development, commercial development, and commercial materials operations with mineral/soil/rock extraction. NDOT has been completing projects with soil disturbance in suitable habitat within the Action Area since the listing of ABB in 1989 (but prior to the downlisting with 4(d) rule) and there has been no decline in ABB attributed to these impacts. Residential developments could be constructed outside city limits or in previously undeveloped or rural areas. State funds only projects without a federal nexus are not covered in this programmatic consultation and need to be considered for cumulative effects. The specific numbers of projects or associated acres of disturbance are difficult if not impossible to quantify.

VII. PROGRAMMATIC CONSULTATION PROCESS

NDOT, USFWS, NGPC, and FHWA jointly developed this programmatic ESA Section 7 and NESCA consultation for common types of transportation actions. The intent is to implement NDOT-specific consultation for ABB that streamlines the process and results in better conservation outcomes for the species. Staff and managers from USFWS Region 6 (Mountain-Prairie) and NGPC have been involved in developing this biological assessment and consultation process. NDOT, USFWS, and NGPC will designate points of contact (POC) who will have responsibility for the ongoing implementation of the programmatic consultation.

If actions are outside the scope of this consultation, as defined in **Section V** of this document, or may affect ESA or state-listed species besides ABB, or any designated critical habitat, then separate or additional Section 7 and NESCA consultation is required. This consultation provides a framework for conducting efficient ESA Section 7 and NESCA consultations through consistency and standardization of project reviews. It also helps expedite the review and permitting process for proposed activities. This NDOT-specific consultation applies only to those projects that can meet the project conditions, effect determinations, and avoidance and minimization measures (AMMs) described in this document.

A. ABB Project Evaluation Form

For individual project reviews, NDOT will complete an ABB Project Evaluation Form for the project file and as an attachment for NEPA documents. The ABB Project Evaluation Form (as described in the ABB Project Evaluation Form [instructional template], **Appendix D**) provides the following information:

- description of proposed action (e.g., type of project and location relative to the high density area)
- quantification of impacts (e.g., habitat assessment mapping results)
- identification of proposed AMMs that will avoid or minimize adverse impacts
- effect determination
- estimated compensatory mitigation credits, if needed

For projects with the following effect determinations, compensatory mitigation would not be required:

- No Effect,
- May Affect, Not Likely to Adversely Affect (NLAA),
- May Affect, Likely to Adversely Affect (LAA) but excepted from prohibited take by the ABB 4(d) Rule, or
- May Affect, Likely to Adversely Affect (LAA) but not prohibited by the ABB 4(d) Rule.

For projects with effect determinations of “May Affect, Likely to Adversely Affect” (LAA) and requiring compensatory mitigation, NDOT will document estimated mitigation credits in the yearly tracking spreadsheet and determine conservation pathways, as needed.

B. Yearly Tracking Spreadsheet

A yearly tracking spreadsheet will be created and used by NDOT to document individual project impact details and to inform a yearly report. The spreadsheet will also serve as a ledger for

compensatory mitigation. The yearly tracking spreadsheet will at a minimum document the following:

- ABB Project Evaluation Form approval date
- project conditions requiring habitat assessment mapping (or lack thereof)
- habitat assessment mapping data (i.e., acres of impact)
- letting date
- estimated construction start and end dates
- estimated compensatory mitigation credits
- conservation pathways utilized, if needed

The yearly tracking spreadsheet would be provided to the designated agency POCs on an annual basis. Upon receipt, USFWS Nebraska Field Office and NGPC can check that projects conform to the consultation parameters and could request additional information to verify conformity. Within 30 days of receipt, USFWS Nebraska Field Office and NGPC can determine if a particular project does not adhere to the parameters of this programmatic consultation. If NDOT is not contacted by the USFWS or NGPC within the 30-day period following the yearly submittal, then NDOT may proceed under the programmatic consultation. This verification period is not intended as another level of review, as the presumption is that the vast majority of submitted projects fall correctly within the programmatic consultation. Rather, it is an opportunity for the USFWS Nebraska Field Office and NGPC to apply local knowledge to projects and provide input relative to conservation pathways utilized.

C. Monitoring/Reporting

NDOT will monitor this programmatic consultation program via ABB Project Evaluation Forms and the yearly tracking spreadsheet. Monitoring individual projects in the yearly tracking spreadsheet will inform the programmatic process on project specific effects as well as the effectiveness of AMMs. When ILF or conservation bank conservation pathways are utilized, then the ILF or conservation bank managing organization becomes responsible for monitoring and reporting the success of compensatory mitigation measures.

NDOT and designated agency POCs will evaluate this information at least annually and make minor modifications, as needed, to the programmatic consultation by mutual agreement among the agencies. Annual reports will be due at the end of each fiscal year (e.g., July 1st) for the State of Nebraska. The annual report will allow POCs to track the number of projects, type of action, acres of habitat affected, amount and type of mitigation, etc. This report will also be used for adaptive management as described below. Examples of the kinds of modifications expected include, but are not limited to, revising mitigation ratios, updating the ABB Project Evaluation Form, updating standard operating procedures (SOPs) for reporting, and updating ABB surveys or other pertinent guidance. Annual meetings should include the following objectives:

- Discuss annual report of covered projects,
- Evaluate and discuss the continued effectiveness of the programmatic consultation,
- Update procedures and project criteria, if necessary, and
- Discuss and resolve any issues related to the programmatic consultation (i.e., signed biological opinion).

NDOT expects to adapt this programmatic consultation, as necessary, based upon new information regarding the species' ecology, conservation needs, and project effects. Adaptive Management for the programmatic consultation will focus on incorporating feedback from users and new or updated information relevant to the consultation. NDOT and the designated agency POCs can also use input from the field to make more substantive changes in the consultation (e.g., revising the impact AMMs) when appropriate. New information prompting such changes may or may not require a re-initiation of the programmatic consultation. Research funded through a conservation pathway or other sources could also provide substantive, technical information that is relevant to potential program revisions. Designated agency POCs will evaluate information for its relevance to the programmatic consultation and its scientific validity. NDOT, FHWA, and designated agency POCs will jointly determine whether or not to incorporate new information into the programmatic consultation with amended BA or BO documents. In some cases, new information could pertain to only a portion of the ABB range and prompt area-specific amendments.

VIII. PROGRAMMATIC EFFECT DETERMINATION

For the multiple transportation project types likely to occur in the five-year program, the temporarily and permanently reduced suitable habitat of 6,376 acres (rounded up) is a relatively small amount (i.e., 0.05%) when compared to the surrounding 13,664,201 acres of suitable habitat within the Action Area (i.e., habitat mapped using land cover data; **Table 1**). Many individual actions covered by the proposed program will have no effect; many are not likely to adversely affect ABB; and neither the proposed incidental nor intentional take occurs in a single location or point in time. Thus, the existing ABB populations would likely be resilient to this level of loss spread out over time and at separate and distant locations. The acres of permittee-responsible mitigation for ABB estimated within the site development project category was calculated to account for compensatory mitigation for all estimated take of ABB, as a worst-case scenario. Given the potential take would not occur at a single location and is estimated to occur over the next five years, the proposed action would not appreciably reduce the likelihood of survival and recovery of the ABB because AMMs will minimize impacts to the species and reduce the level of take, and conservation pathways will result in long-term mitigation for impacts.

Table 11. Total Soil Disturbance in Suitable Habitat for 5-Year Program

DESCRIPTION	TOTAL SOIL DISTURBANCE IN SUITABLE HABITAT (AC)
Take is Unlikely (NLAA) (i.e., ITS projects; Table 5)	0.64
Exception to Take Prohibitions (i.e., Site Development; Table 6)	2288
Prohibited Incidental Take (Table 7)	3044
Prohibited Incidental Take Post-Letting (Table 10)	1043
Total:	**6375.64**

The following agencies have reviewed this document, and agree with the recommended effect determinations:

For Nebraska Department of Transportation:

Signature	Printed Name	Title	Date

For Federal Highway Administration:

Signature	Printed Name	Title	Date

IX. LITERATURE CITED

Anderson, R.S. and S.B. Peck. 1985. The insects and Arachnids of Canada: Part 13. Ottawa: Canadian Government Publishing Center.

Bedick, J.C., B.C. Ratcliffe, W.W. Hoback, and L.G. Higley. 1999. Distribution, ecology, and population dynamics of the American burying beetle [*Nicrophorus americanus* Olivier (Coleoptera, Silphidae)] in South-central Nebraska, USA. Journal of Insect Conservation. 3: 171-181.

Davidson, A. and A. McKerrow. 2016. GAP/LANDFIRE National Terrestrial Ecosystems 2011 [Data set]. U.S. Geological Survey. Accessible: https://doi.org/10.5066/F7ZS2TM0.

Hoback, W.W. and Conley, A. 2014. Overwintering biology and tests of trap and relocate as a conservation measure for burying beetles. Nebraska Department of Roads – Technical Report.

Hoback, W.W. 2016. Effects of compaction and soil moisture on American burying beetles. Nebraska Department of Roads – Technical Report.

Holloway, A.K. and G.D. Schnell. 1997. Relationship between numbers of the endangered American burying beetle *Nicrophorus americanus* Oliver (Coleoptera: Silphidae) and available food resources. Biological Conservation. 81: 145-152.

Jenkins, T., W.W. Hoback, D. Leasure, P. Mulder, and C. Davis. 2018. Distribution of the endangered American burying beetle at the northwestern limit of its range. Insect Systematics and Diversity. 2:1-8.

Jorgensen, C.F., J.D. Jurzenski, R. Grosse, A. Bishop, R. Harms, M. Koch, M. Fritz, W.W. Hoback. 2014. American burying beetle model development: a recap of the use and explanation of the American burying beetle species distribution model and analysis in Nebraska's Sandhills. White Paper, Rainwater Basin Joint Venture, 23 pp.

Jurzenski, J., D.G. Snethen, M. Brust, and W.W. Hoback. 2011. New records of carrion beetles in Nebraska reveal increased presence of the American burying beetle, *Nicrophorus americanus* Olivier (Coleoptera: Silphidae). Great Plains Research 21: 131-143.

Jurzenski, J.D., C.F. Jorgensen, A. Bishop, R. Grosse, J. Riens, and W.W. Hoback. 2014. Identifying priority conservation areas for the American burying beetle, *Nicrophorus americanus* (Coleoptera: Silphidae), a habitat generalist. Systematics and Biodiversity 12(2): 149–162.

Kozol, A.J., M.P. Scott, and J.F.A. Traniello. 1988. The American burying beetle, *Nicrophorus americanus*: Studies on the natural history of a declining species. Psyche 95: 167-176.

Li, X., M. Mamo, W. Schacht, T. Awada, and H. Blanko. 2016. Identifying and addressing soil property issues affecting roadside vegetation establishment. Nebraska Department of Roads – Research Report.

Lomolino, M.V., J.C. Creighton, G.D. Schnell, and D.L. Certain. 1995. Ecology and conservation of the endangered American burying beetle (*Nicrophorus americanus*). Conservation Biology. 9: 605-614.

Lomolino, M.V. and J.C. Creighton. 1996. Habitat selection, breeding success, and conservation of the endangered American burying beetle (*Nicrophorus americanus*). Biological Conservation 77: 235–241.

McPherron, M.M., J. Jurzenski, M.A. Albrecht, K.M. Farnsworth-Hoback, T.L. Walker, and W.W. Hoback. 2012. Model of habitat suitability for American burying beetles in Nebraska's Loess Canyons ecosystem. Trends in Entomology 8:27-36.

NatureServe. 2023. NatureServe Explorer: An online encyclopedia of life [web application]. NatureServe, Arlington, Virginia. Accessible: https://explorer.natureserve.org.

Nebraska Department of Environment and Energy (NDEE). 2025. Wind Energy Generation in Nebraska website. Accessible (as of January 28, 2025): https://dee.nebraska.gov/state-energy-information/energy-statistics/fuels/wind/wind-energy-generation-nebraska.

Nebraska Department of Transportation (NDOT). 2017. Standard Specification for Highway Construction. Accessible: https://dot.nebraska.gov/media/g4qp4y0d/2017-specbook.pdf.

Nebraska Department of Transportation (NDOT). 2022. Roadway design manual. Accessible: https://dot.nebraska.gov/media/gnwk21cs/rdm.pdf.

Nebraska Department of Transportation (NDOT). 2023a. NDOT Roadside Vegetation Establishment and Management. Accessible: https://dot.nebraska.gov/media/4016/veg-manual.pdf.

Nebraska Department of Transportation (NDOT). 2023b. Programmatic agreement among the Federal Highway Administration, US Fish and Wildlife Service, Nebraska Department of Transportation, and Nebraska Game and Parks Commission for the determination of effects to state and federally listed species from the Federal-Aid Highway Program. Approved March 20, 2023.

Nebraska Department of Transportation (NDOT). 2025a. Borrow – Waste Excavation – Plant – Stockpile – Construction Debris website. Accessible: https://dot.nebraska.gov/business-center/contractor/use-request/.

Nebraska Department of Transportation (NDOT). 2025b. *In-progress*: Methods and assumptions for soil disturbance calculations for the American burying beetle programmatic biological assessment.

Nebraska Game and Parks Commission (NGPC). 2023. American burying beetle webpage. Lincoln, Nebraska. Accessible (as of July 12, 2023): https://outdoornebraska.gov/learn/nebraska-wildlife/nebraska-animals/insects/american-burying-beetle/.

New York State Department of Environmental Conservation. 2009. American burying beetle fact sheet. Accessible: http://www.dec.ny.gov/animals/7124.html.

Oklahoma Department of Transportation (ODOT). 2014. Programmatic biological assessment for the Oklahoma Department of Transportation transportation system improvement projects and their effects on the American burying beetle. 24 pp.

Pukowski, E. 1933. Okologische untersuchungen an *Necrophorus* F. (Ecological investigation of *Necrophorus* F.). Zeitschrift fur Morphologie und Oekologie der Tiere 27: 518-586.

Ratcliffe, B.C. 1996. The carrion beetles (Coleoptera: Silphidae) of Nebraska. Bulletin University of Nebraska State Museum. 13: 1-100.

Roberts, C.P., A.K. Ludwig, D.T. Fogarty, E.F. Stuber, D.R. Uden, T.L. Walker, Jr, and D. Twidwell. 2025. Population increases of the threatened American burying beetle (*Nicrophorus americanus*) linked to large-scale collaborations in a working lands ecoregion. Biological Conservation 301: 110865.

Scott, M.P. 1998. The ecology and behavior of burying beetles. Annual Review of Entomology 43: 595-618.

Sikes, D.S. and C.J. Raithel. 2002. A review of hypotheses of decline of the endangered American burying beetle (Silphidae: *Nicrophorus americanus* Olivier). Journal of Insect Conservation 6:103–113.

Trumbo, S.T. 1992. Monogamy to communal breeding: exploitation of a broad resource base by burying beetles (*Nicrophorus*). Ecological Entomology 17: 289 – 298.

U.S. Fish and Wildlife Service (USFWS). 1991. American burying beetle (*Nicrophorus americanus*) recovery plan. Newton Corner, Massachusetts. 80 pp.

U.S. Fish and Wildlife Service (USFWS). 2008. American burying beetle (*Nicrophorus americanus*) 5 year review: Summary and evaluation. Newton Corner, Massachusetts. 46 pp.

U.S. Fish and Wildlife Service (USFWS). 2015. Biological opinion for the Oklahoma Department of Transportation's transportation system improvement projects for year 2015-2024.

U.S. Fish and Wildlife Service (USFWS). 2018. American burying beetle (*Nicrophorus americanus*) range-wide presence/absence survey guidance. Accessible (as of July 12, 2023): https://www.fws.gov/media/american-burying-beetle-rangewide-survey-guidance-may-2018.

U.S. Fish and Wildlife Service (USFWS). 2019. Species status assessment report for the American burying beetle. Version 1.0. Accessible (as of April 19, 2022): https://ecos.fws.gov/ServCat/DownloadFile/165011.

U.S. Fish and Wildlife Service (USFWS). 2020a. Endangered and Threatened Wildlife and Plants; Reclassification of the American Burying Beetle From Endangered to Threatened With a Section 4(d) Rule. Federal Register Vol. 85, No. 200, October 15, 2020.

U.S. Fish and Wildlife Service (USFWS). 2020b. Intra-Service Section 7 biological opinion on reclassifying the American burying beetle (*Nicrophorus americanus*) from endangered to threatened on the federal list of endangered and threatened wildlife with a 4(d) Rule, Final Rule. Accessible: https://www.fws.gov/sites/default/files/documents/Intra%20Service%20Section%207%20Biological%20Opinion%20Reclassifying%20American%20Burying%20Beetle%20From%20Endangered%20to%20Threatened.pdf.

U.S. Fish and Wildlife Service (USFWS). 2020c. Reclassification of the American burying beetle from endangered to threatened with a Section 4(d) Rule. Accessible (as of November 16, 2022): https://www.fws.gov/species-publication-action/reclassification-american-burying-beetle-endangered-threatened-section.

U.S. Fish and Wildlife Service (USFWS). 2021a. American Burying Beetle 4(d) Determination Key Definitions. Accessible: https://www.fws.gov/media/american-burying-beetle-d-key-definitions.

U.S. Fish and Wildlife Service (USFWS). 2021b. Biological opinion on the U.S. Fish and Wildlife Service's proposed issuance of an incidental take permit for the federally threatened American burying beetle. TC Energy Keystone XL Pipeline, LP. 59 pp.

U.S. Fish and Wildlife Service (USFWS). 2023a. Endangered Species Act Compensatory Mitigation Policy. Appendix 1, 501 FW 3.

U.S. Fish and Wildlife Service (USFWS). 2023b. Mitigation Policy. Appendix 1, 501 FW 2.

U.S. Geological Survey (USGS). 2016. Gap analysis project (GAP), GAP/LANDFIRE National Terrestrial Ecosystems 2011. U.S. Geological Survey data release. Accessible: https://doi.org/10.5066/F7ZS2TM0.

Willemssens, K.A. 2015. Soil preferences of *Nicrophorus* beetles and the effects of compaction on burying behavior. Master's Thesis. University of Nebraska – Lincoln. 102 pp.

X. GLOSSARY

ABB 4(d) rule - a rule regarding ABB that specifies what constitutes prohibited taking of ABB and provides exceptions from take prohibitions (see Excepted Take). The rule does not remove, or alter in any way, the consultation requirements under Section 7 of the ESA or NESCA. The Intra-Service Section 7 Biological Opinion on the final 4(d) rule (ABB 4(d) BO) provides a framework for streamlined consultation as an option for federal and non-federal agencies to use. The 4(d) rule prohibits all intentional take of ABB. Within the Northern Plains analysis areas, USFWS prohibits incidental take only if it occurs in suitable habitat and is the result of soil disturbance, which includes converting habitat from an existing land use to a different land use. Overall, the following prohibitions apply to ABB:

(i) Take of ABB, except that take that is incidental to otherwise lawful activity (incidental take), is prohibited only when the take occurs on suitable ABB habitat in the Northern Plains Analysis Areas where the incidental take results from soil disturbance.

(ii) Possession and other acts with unlawfully taken ABB.

> (A) It is unlawful to possess, sell, deliver, carry, transport, or ship, by any means whatsoever, any ABB that was taken in violation of paragraph (d)(1)(i) of this section or State law.
>
> (B) Notwithstanding paragraph (d)(1)(ii)(A) of this section, Federal and State law enforcement officers may possess, deliver, carry, transport, or ship any ABB taken in violation of the Act as necessary in performing their official duties.

(iii) Import and export of the ABB.

(iv) Interstate or foreign commerce. It is unlawful to deliver, receive, carry, transport, or ship, by any means whatsoever, in interstate or foreign commerce or in the course of a commercial activity, ABB.

(v) Sale or offer for sale. It is unlawful to sell or to offer for sale in interstate or foreign commerce any ABB.

Action - As defined in ESA Section 7 regulations (50 CFR 402.02), “action” means “all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies in the United States or upon the high seas.”

Action area - all areas to be affected directly or indirectly by the action and not merely the immediate area involved in the action. For the purposes of this programmatic consultation, the Action Area includes the combined USFWS Northern Plains Analysis Area and NGPC range for ABB.

Affect/effect - to affect (a verb) is to bring about a change ("The proposed action is likely to adversely affect piping plovers nesting on the shoreline"). The effect (usually a noun) is the result ("The proposed highway is likely to have the following effects on the Florida scrub jay"). "Affect" appears throughout section 7 regulations and documents in the phrases "may affect" and "likely to adversely affect." "Effect" appears throughout section 7 regulations and documents in the phrases "adverse effects," "beneficial effects," "effects of the action," and "no effect."

Biological assessment (BA) - information prepared by, or under the direction of, a Federal agency to determine whether a proposed action is likely to: (1) adversely affect listed species or designated critical habitat; (2) jeopardize the continued existence of species that are proposed for listing; or (3) adversely modify proposed critical habitat. The outcome of biological assessments determines whether formal consultation or a conference is necessary.

Biological opinion (BO) - a document which includes: (1) the opinion of USFWS as to whether or not a Federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of designated critical habitat; (2) a summary of the information on which the opinion is based; and (3) a detailed discussion of the effects of the action on listed species or designated critical habitat.

Compensatory mitigation - (as provided in the Endangered Species Act Compensatory Mitigation Policy [USFWS 2023]) - compensation or offsets for remaining unavoidable impacts after all appropriate and practicable avoidance and minimization measures have been applied, by replacing or providing substitute resources or environments (see 40 CFR 1508.20) through the restoration, establishment, enhancement, or preservation of resources and their values, services, and functions.

Conditional land cover – As defined in the Intra-Service Section 7 Biological Opinion on Reclassifying the American Burying Beetle (*Nicrophorus americanus*) From Endangered to Threatened on the Federal List of Endangered and Threatened Wildlife with a 4(d) Rule, Final Rule for LANDFIRE/GAP land cover map units: Land cover types that can be favorable under some conditions and unsuitable under others. For example, most pasture land in southern plains analysis areas may be favorable habitat if grazing is light to moderate or infrequently mowed, but the same area may be unsuitable if it is heavily grazed or frequently mowed. Fields managed for hay can be unsuitable habitat when the vegetation is mowed at short heights, but can be favorable habitat between cuttings when the grass/hay is tall enough to provide suitable habitat for birds and mammals that are carrion sources for ABBs. Wetlands are another example. They may be unsuitable under flood conditions, but very important habitat during droughts, given that ABBs need moist soils.

Conservation pathway - options for mitigation within this programmatic consultation that contribute to the propagation and survival of ABB to ensure there is a net conservation benefit to ABB for projects requiring compensatory mitigation.

Covenant of dedication - an NDOT deed restriction document utilized to restrict the use and title of realty land. The covenant of dedication restricts land use in perpetuity as a conservancy area.

Critical habitat - (i) the specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the provisions of the ESA, on which are found those physical or biological features (1) essential to the conservation of the species and (2) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the ESA, upon a determination by the Secretary that such areas are essential for the conservation of the species (defined in Section 3 of the ESA). No critical habitat has been designated for ABB by USFWS.

Cumulative effects - are those effects of future State or private activities, not involving Federal activities, which are reasonably certain to occur within the action area of the Federal action subject to consultation. This definition applies only to section 7 analyses and should not be confused with the broader use of this term in the National Environmental Policy Act or other environmental laws.

Excepted take - or “exceptions to take prohibitions” refers to activities that would be prohibited but were listed as an exception from prohibitions in the ABB 4(d) rule. Exceptions to prohibited take can also

be found in Section 10 recovery permits or incidental take permits. The ABB 4(d) rule provides the following exceptions to prohibited take:

(i) Any employee or agent of the Service or of a State conservation agency that is operating a conservation program pursuant to the terms of a cooperative agreement with the Service in accordance with section 6(c) of the Act, who is designated by his or her agency for such purposes, may, when acting in the course of his or her official duties, take ABB, provided that, for State conservation agencies, the ABB is covered by an approved cooperative agreement to carry out conservation programs.

(ii) Federal or State government agencies may incidentally take ABB when conducting wildlife management activities in the Northern Plains Analysis Areas.

(iii) Incidental take of ABB resulting from ranching and grazing activities is allowed.

Favorable land cover – As defined in the Intra-Service Section 7 Biological Opinion on Reclassifying the American Burying Beetle (*Nicrophorus americanus*) From Endangered to Threatened on the Federal List of Endangered and Threatened Wildlife with a 4(d) Rule, Final Rule for LANDFIRE/GAP land cover map units: Land cover types with suitable soils and vegetation to support all or critical portions of the ABB life cycle. Favorable lands may range from high to low quality ABB habitat, but most of these lands should be capable of supporting ABB populations. The ABB uses a wide variety of habitats and favorable land cover types including multiple forest, savanna, shrub, and grassland/herbaceous land covers.

Federal nexus - phrase used to indicate an activity's connection to a federal agency as a result of that agency authorizing, funding, or carrying out the activity.

Formal consultation - a process between the USFWS and a Federal agency or applicant that: (1) determines whether a proposed Federal action is likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat; (2) begins with a Federal agency's written request and submittal of a complete initiation package; and (3) concludes with the issuance of a biological opinion and incidental take statement by USFWS. If a proposed Federal action may affect a listed species or designated critical habitat, formal consultation is required (except when USFWS concurs, in writing, that a proposed action "is not likely to adversely affect" listed species or designated critical habitat).

Harass - Harass is defined by USFWS as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering."

High density area - area in Nebraska with historical ABB densities greater than 0.04 ABB/acre (specific to this NDOT ABB Programmatic Consultation, **Appendix A**).

Incidental take - defined by ESA as take that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." This definition applies to all listed fish or wildlife species. For example, bulldozing land for road construction may kill ABBs in the soil, but the purpose of the activity is not to kill ABBs.

Indirect effects - those effects that are caused by or will result from the proposed action and are later in time but are still reasonably certain to occur.

Intentional take - when the reason for the activity or action is to conduct some form of take. For instance, conducting a research project that includes collecting and handling ABBs is a form of intentional take. Intentionally killing or harming ABBs is also intentional take (also referred to as purposeful take) and is prohibited by the ABB 4(d) rule.

Jeopardize the continued existence of - to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.

Likely to adversely affect - the appropriate finding in a biological assessment (or conclusion during informal consultation) if any adverse effect to listed species may occur as a direct or indirect result of the proposed action or its interrelated or interdependent actions, and the effect is not: discountable, insignificant, or beneficial (see definition of "is not likely to adversely affect"). In the event the overall effect of the proposed action is beneficial to the listed species, but is also likely to cause some adverse effects, then the proposed action "is likely to adversely affect" the listed species. If incidental take is anticipated to occur as a result of the proposed action, an "is likely to adversely affect" determination should be made. A "is likely to adversely affect" determination requires the initiation of formal section 7 consultation.

Listed species - any species of fish, wildlife or plant which has been determined to be endangered or threatened under section 4 of ESA or NESCA (Nebraska Revised Statute 37-806).

Marginal land cover - As defined in the Intra-Service Section 7 Biological Opinion on Reclassifying the American Burying Beetle (*Nicrophorus americanus*) From Endangered to Threatened on the Federal List of Endangered and Threatened Wildlife with a 4(d) Rule, Final Rule for LANDFIRE/GAP land cover map units: Land cover types that can provide limited habitat for some portions of the ABB life cycle. Examples include land covers that have poor or thin soils (such as barren lands) that make them unsuitable for reproduction, but may provide habitat for day use or help support potential carrion species to some degree.

May affect - the appropriate conclusion when a proposed action may pose any effect on listed species or designated critical habitat.

Non-prohibited take - also referred to as “take not prohibited” are activities or actions that are not explicitly prohibited or restricted by regulations or rules regarding the conservation or protection of a specific species. In the context of this programmatic BA, it refers to activities that do not violate the rules outlined in the 4(d) rule for ABB).

No effect - the appropriate conclusion when the action agency determines its proposed action will not affect a listed species or designated critical habitat.

Northern Plains Analysis Areas - means portions of Nebraska and South Dakota to initially include an 18.6-mile buffer around each capture location to determine the outside boundaries of the analysis area.

Not likely to adversely affect (NLAA) - the appropriate conclusion when effects on listed species are expected to be discountable, insignificant, or completely beneficial. Beneficial effects are contemporaneous positive effects without any adverse effects to the species. Insignificant effects relate to the size of the impact and should never reach the scale where take occurs. Discountable effects are

those extremely unlikely to occur. Based on best judgment, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.

Permanent impacts - impacts that eliminate ABB habitat (e.g., buildings, roads, quarries, strip mines), as well as any impact to habitat that takes more than 5 years to re-establish as suitable for ABB use.

Point of contact (POC) – Individuals from agencies (i.e., FHWA, USFWS, NGPC, and NDOT) designated as points of contact (POC) who will have responsibility for the ongoing implementation of the programmatic consultation.

Prime habitat - suitable habitat that generally contains higher densities of ABB. Examples include undeveloped wet meadows with some trees, especially cottonwoods (*Populus deltoides*), or forest areas. Water sources, including the presence of a river, stream, or sub-irrigated soils (water is close to the surface as a result of shallow aquifer), are located within one mile. Low wetland meadows could be grazed by cattle or used for haying. Cropland is not visible within a one-mile area. Sources of light pollution, including yard lights or houses, are absent.

Prohibited take - see **ABB 4(d) rule** for take prohibitions.

Purposeful take - when the reason for the activity or action is to conduct some form of take. For instance, conducting a research project that includes collecting and handling ABBs is a form of purposeful take. Intentionally killing or harming ABBs is also purposeful take (also referred to as intentional take) and is prohibited by the ABB 4(d) rule.

Roadway - for the purposes of this programmatic consultation, the constructed roadway prism from the toe-of-foreslope to the toe-of-foreslope.

Soil disturbance - means movement or alteration of soil associated with modifying the existing land use. Soil disturbance includes actions such as grading, filling, soil excavating or topsoil stripping. Soil disturbance also includes non-physical alterations such as chemical treatment, including ground or soil sterilizers, and pesticides that would make the habitat unsuitable.

Standard operating procedure (SOP) - a set of step-by-step instructions compiled by an organization to help workers carry out routine operations. For the purposes of this programmatic biological assessment, the documents provide a template and instructions to complete consultation under the terms of this programmatic.

Suitable habitat - as defined by Provisions of the ABB 4(d) rule (USFWS, 2020a), are “areas where suitable soils contain the appropriate abiotic elements (e.g., soil temperature, soil moisture, particle size, etc.) that are favorable for excavation and formation of brood chambers and where appropriate carrion for reproduction is available”. Most areas outside the toe-of-foreslope are considered suitable habitat (unless they meet the unsuitable or unfavorable descriptions described above). These suitable areas could provide habitat for ABB, support critical portions of the ABB life cycle, or help support potential food resources.

Take - Take is defined in Section 3 of the ESA as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Harm is further defined by USFWS to

include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined by FWS as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Nebraska Statute (37-802(6)) defines take as to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct."

Temporary impact (or Temporary soil disturbance) - activities or actions that alter or remove ABB habitat after which the disturbed area is restored to a condition suitable for ABB use within five years of the original activities. Temporary impacts would not convert suitable habitat to unfavorable habitat.

Tenerals - Immature ABBs that emerge as adults in July and August. The tenerals overwinter in the soil and comprise the reproductive populations the following June or July.

Unfavorable habitat - for ABB, includes areas with frequent disturbance or other characteristics making it unlikely ABB would find adequate food resources and refuge, or suitable breeding conditions. Unfavorable habitat for ABB includes the following areas, as worded in the ABB 4(d) Determination Key Definitions (USFWS, 2021), unless the area has already been classified as unsuitable habitat:

1. Land that is tilled on a regular basis, planted in monoculture, and does not contain native vegetation.
2. Pasture or grassland that has been maintained through frequent mowing, grazing, or herbicide application at a height of 20 cm (8 inches) or less.
3. Land that has already been developed and no longer exhibits topsoil, leaf litter, or vegetation.
4. Urban areas with maintained lawns, paved surfaces, or roadways.
5. Stockpiled soil without vegetation.
6. Wetlands or permanent waterbodies with standing water or saturated soils. Areas adjacent to wetlands and/or riparian areas are not considered unfavorable for the ABB, as they may be important for ABBs seeking moist soils during dry conditions.

NDOT has worked with USFWS and NGPC to further refine the definition of a roadway, as included in #4 above. The roadway as defined in this BA is the constructed roadway prism from the toe-of-foreslope to the toe-of-foreslope. Other areas within the project limits (outside of the toe-of-foreslope) can also be considered unfavorable habitat. This depends on proximity to adjacent unfavorable habitat, length of adjacent unfavorable habitat, and type of unfavorable habitat (e.g., areas around standing water wetlands are less likely to be called unfavorable). If it is a patchwork of suitable and unfavorable habitat or only one side of the road has unfavorable habitat, then the area should not be considered unfavorable.

Unsuitable habitat - for ABB, generally includes "land cover types that do not provide habitat that would be favorable for any portion of the ABB life cycle (such as open water or highly developed urban lands)" (USFWS 2019, 2020b). Various sections of the Species Status Assessment (USFWS 2019) provide information about unsuitable habitat. This information is paraphrased as the following: areas permanently inundated with water (i.e., stream or river channels and ponds), paved areas such as asphalt or concrete roadway and driveways, and frequently compacted soil or gravel surfaces such as

field access drives and gravel roadways. Urban areas consisting of all paved or hard surfaces and areas lacking vegetation would also be considered unsuitable habitat.

Unsuitable land cover – As defined in the Intra-Service Section 7 Biological Opinion on Reclassifying the American Burying Beetle (*Nicrophorus americanus*) From Endangered to Threatened on the Federal List of Endangered and Threatened Wildlife with a 4(d) Rule, Final Rule for LANDFIRE/GAP land cover map units: Land cover types that do not provide habitat that would be favorable for any portion of the ABB life cycle (such as open water or highly developed urban lands).

APPENDIX A:

JUSTIFICATION OF DIFFERING ABB DENSITY APPLICATION WITHIN NEBRASKA RANGE

FELSBURG HOLT & ULLEVIG
connecting & enhancing communities

MEMORANDUM

TO: Jeff Runge, USFWS and Melissa Marinovich, NGPC

FROM: Jessica Jurzenski, FHU (on behalf of Jeff Hartman, NDOT)

DATE: 7/1/2023

SUBJECT: Justification of Differing ABB Density Application within Nebraska Range (NDOT Programmatic Biological Assessment for ABB, Task Order VK2310, FHU Project Number: 123646-01)

The purpose of this memorandum is to provide data and justification for the use of two different density estimates for evaluating potential take of the American burying beetle (ABB) (*Nicrophorus americanus)*, as part of the Nebraska Department of Transportation (NDOT) programmatic biological assessment for ABB. This is important because the probable occurrence of ABB across its range varies, and the estimate of take should also reflect areas with known higher or lower densities. It is also our goal that this analysis provides enough information to allow the U.S. Fish and Wildlife Service (USFWS) and Nebraska Game and Parks Commission (NGPC) to similarly adopt the use of two density estimations in all Northern Plains Analysis consultations.

The current ABB density estimate being utilized for Endangered Species Act (ESA) and Nebraska Nongame and Endangered Species Conservation Act (NESCA) compliance was last calculated in 2016 for the Nebraska Public Power District (NPPD) R-Project (a large capacity transmission line corridor project traversing several central Nebraska counties). As discussed in Section 5.2 of the R-Project Habitat Conservation Plan (HCP) (NPPD 2018), take of ABB is often estimated using acres of suitable habitat. In order to estimate the take of ABB within impacted suitable habitat, the density of ABB per acre is a critical factor. NPPD and USFWS agreed upon a take estimation method in December 2016 (NPPD 2018). The take estimation method resulted in the use of a 0.13 ABB/acre to calculate the number of beetles relative to impacted acres.

Although NPPD is in the process of revising the R-Project's HCP and potentially the project's take estimate, the take estimate in the 2018 HCP was completed with a historical dataset comprised of sample points surveyed between 1994 and 2011 and additional survey data collected specifically for the R-Project Permit Area between 2014 and 2016. The dataset was refined by using only surveys with five trap nights or more, 5-gallon bucket traps, and a minimum of six unmarked beetles. The resulting dataset consisted of 299 sample points. A method was also devised during the R-Project data collection to standardize the number of ABB captures for sample points with greater than five trap nights. The density for each trap was calculated based on a 500-acre effective trap radius and adjusted for a capture efficiency of 90%. This methodology was based on data reported in Stephanie Butler's master's thesis on marking methods and survey protocols for burying beetles (Butler 2011).

This memorandum assumes the historical dataset used by the R-Project was the same dataset compiled for NGPC and USFWS for the creation of a habitat suitability model by, as part of Jessica Jurzenski's dissertation (Jurzenski et. al. 2014) and further refined by Chris Jorgensen and the Rainwater Basin Joint Venture (Jorgensen et. al. 2014). The current analysis, as described by this memo, utilizes the same historical dataset, which will be referred to as the 'full database'. In its entirety, the full database documents 11,919 ABB from

1,036 sample points with known sampling years and includes another 1,915 sample points with ABB absence (**Table 1,** "Full Database").

The same exclusion parameters which were applied to the R-Project were applied to the current analysis with some minor refinements. The minor refinements consisted of removing the following groups of sample points:

- prior to 2001 (although none of the 2001 and 2002 sample points met other criteria, see **Table 1**),
- experimental research (because conditions were experimentally altered to change ABB capture rates),
- trap and relocated activities (because ABB were being removed from the area to the extent that it could alter the first capture rate of nearby sample points).

The refined dataset now being used to calculate densities consists of 232 sample points (See **Table 1,** "Refined 5TN"). Similar to the R-Project, the 99th percentile of the calculated densities results in 0.13 ABB/acre. More specifically, three sample points had an ABB density of 0.13 ABB/acre or greater. The sample points in this refined dataset were plotted on a map to visually verify the location of high density sample points (**Figure 1**). If the 1,036 sample points[1] in the full database are examined and the inconsistencies of trap night, trap type, experimental conditions, etc., are ignored to allow for a bigger picture of the known ABB capture rates and densities, then the 99th percentile of the full database resulted in a 0.09 ABB/acre density. Also, if sample points with fewer than five trap nights in the full dataset are estimated using the same method applied to sample points with greater than five trap nights, then the probable ABB captures and associated densities only adds one more sample point with a density of 0.13 ABB/acre or greater. For example, the extrapolated density of 0.14 ABB/acre was calculated for a sample point in the Loess Canyons which was surveyed for only four trap nights in 2010 (**Figure 2**). These data support that ABB densities equal to or greater than 0.09 ABB/acre could be considered 'high density' sample locations.

The R-Project HCP also states, "This data set is likely composed almost exclusively of ABB surveys conducted within good to prime habitats in the Sandhills." This assumption is not well supported by the historic dataset (aka full database) nor by the fact that a large percent of sampling conducted in 2010 and 2011 was completed purposely in poor to good habitat as part of building and validating a habitat suitability model in the Sandhills Ecoregion (Jurzenski et. al. 2014). Thus, it would be prudent to recognize both the refined dataset and full database as having sample locations in a range of poor to prime habitat (as defined in the R-Project HCP, NPPD 2018). Therefore, the identification of a high density area using sample locations with higher density of ABBs per acre (e.g., 85th percentile and greater of refined dataset) would better predict areas with prime habitat and anticipated higher ABB capture rates (and densities).

Oklahoma USFWS determined conservation priority areas for similar reasons by creating a 6.2-mile buffer for locations with trap-confirmed ABB presence within the last 10 years. Conservation priority area locations that did not intersect the buffer of three or more other locations were removed (USFWS 2014). The intent is to identify areas where conservation efforts could be focused and where higher ratios of mitigation for adverse impacts to ABB should occur. A high density area in Nebraska could similarly be identified and represent areas with known ABB presence based on historical data rather than recent survey results. Within the refined dataset, the 85th percentile of the calculated densities results in 0.04 ABB/acre. The sample locations with this density or greater also have capture rates of five ABB per trap night or greater. These two statistics strongly support the potential for good to prime habitat to occur within the vicinity of those sample locations. Given this, an 18-mile buffer was created around sample locations with 0.04 ABB/acre or greater densities to establish a high density area for Nebraska (**Figure 1**). The 18-mile buffer was applied to mimic its use by

[1] Nineteen (19) sample locations were excluded from the density calculation because the number of trap nights were unknown. Therefore, 1,017 sample locations were examined in these assessments.

USFWS for the ABB range (aka Northern Plains Analysis area) and as the maximum recorded movement of ABB in a single night (Jurzenski et. al. 2011, USFWS 2019). This high density area includes all but five of the sample locations in the refined dataset. The calculated densities for the sample locations outside of the high density area boundary range from 0.01 ABB/acre to 0.03 ABB/acre.

To test the validity of high density area boundary, it was compared to the full database to ensure other sample locations with high capture rates and densities fall within its boundary. **Figure 2** displays the known traps within the full database with ABB presence and absence to illustrate the high density area boundary is representative of the distribution of ABB in Nebraska. Within the full dataset, there are 129 sample points (12%) with ABB presence located outside of the high density area (**Table 1,** "Outside high density area"). Of the sample locations located outside of the high density area, the calculated densities ranged from 0.002 ABB/acre to 0.05 ABB/acre and the 99th percentile resulted in a density of 0.05 ABB/acre[2]. Only two sample locations outside of the high density area had calculated densities of 0.04 and 0.05 ABB/acre; these were located in Keya Paha County (as part of a 2010 trap and relocate project)

For further validation, 218 sampling locations are known to occur in 2012 under collection permit TE045150-0 (Dr. W. Wyatt Hoback) and 49 sample locations are known to occur from 2014 to 2016, 2021, and 2022 under collection permit TE09941B-03 (FHU authorized individuals). These sampling locations were examined for ABB densities greater than 0.04 ABB/acre. None of the 2014 through 2022 sample locations were located outside the high density area boundary. Of the 218 sample locations surveyed in 2012, only 35 were located outside the high density area boundary. The calculated densities for these 35 sample locations range from 0.002 ABB/acre to 0.03 ABB/acre. **Figure 3** is provided as a third form of evaluation showing the habitat suitability model for ABB in the Sandhills Ecoregion (Jorgenson et. al. 2014). Although this model is slightly modified from the model described in Jurzenski et. al. 2014, the natural breaks at 85% probable occurrence were similar as having the greatest sensitivity and potential for defining high density areas. The high density area defined in this memo nearly covers the 85-100% probable occurrence areas of the model. An area of higher probability occurs west of the high density area, which has poor survey information. A survey in June 2023, as part of a NGPC project, captured two ABB within the predicted higher probability area, which would correspond to 0.4 ABB/trap night and a density of 0.004 ABB/acre. This data suggests the area does not likely have ABB densities great enough to include the area in the high density area.

Recommendations

The following recommendations are meant to account for annual fluctuation in ABB population and protect against underestimation of potential incidental take. The recommended method for take estimation via ABB density is to apply a 0.13 ABB/acre for projects located within the high density area identified in this memorandum and **apply 0.08 ABB/acre for projects located outside of the high density area** (but still within the known range of ABB). The recommended take estimation density outside of the high density area is two times more than the trap density examined in this memo (except for a single sample location in Keya Paha County with a 0.05 ABB/acre density estimate). A density estimate of 0.08 ABB/acre is greater than the 98th percentile of the refined dataset. It is anticipated that projects located within the high density area boundary would also have higher mitigation ratios than projects located outside of the high density area. It is also possible, ABB surveys conducted since 2011, which are not readily ascertainable, may have records of ABB captures and corresponding densities greater than what is found in the historical database.

[2] Sample points with fewer than five trap nights in the full dataset are estimated using the same method applied to sample points with greater than five trap nights.

This memorandum is meant to serve as meaningful data and the appropriate documentation to provide USFWS and NGPC with defensible justification in the application of both density estimation methods presented. USFWS and NGPC evaluations of other sample locations may be included in the boundary in the future. It is recommended the high density area boundary is evaluated each year after annual reports are submitted (per the terms of USFWS and NGPC permits for handling ABB).

References:

Butler, S.R. 2011. Tests of marking methods and survey protocols for burying beetles (Coleoptera: Silphidae). MS Thesis, University of Nebraska-Kearney.

Nebraska Public Power District (NPPD). 2018. R-Project Final Habitat Conservation Plan.

Jorgensen, C.F., J.D. Jurzenski, R. Grosse, A. Bishop, R. Harms, M. Koch, M. Fritz, W.W. Hoback. 2014. American burying beetle model development: a recap of the use and explanation of the American burying beetle species distribution model and analysis in Nebraska's Sandhills. February 2014.

Jurzenski, J.D., D.G. Snethen, M. Brust, and W.W. Hoback. 2011. New records of carrion beetles in Nebraska reveal increased presence of the American burying beetle, Nicrophorus americanus Olivier (Coleoptera: Silphidae). Great Plains Research 21: 131-143.

Jurzenski, J.D., C.F. Jorgensen, A. Bishop, R. Grosse, J. Riens, and W.W. Hoback. 2014. Identifying priority conservation areas for the American burying beetle, Nicrophorus americanus (Coleoptera: Silphidae), a habitat generalist. Systematics and Biodiversity. DOI: 10.1080/14772000.2014.892542.

U.S. Fish and Wildlife Service (USFWS). 2019. Species Status Assessment Report for the American Burying Beetle (Nicrophorus americanus). https://www.fws.gov/species/american-burying-beetle-nicrophorus-americanus.

TABLE 1. Sample Points by Year

DATA SET	SAMPLING YEAR												TOTAL NO. OF TRAPS
	1994 - 2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	
Refined 5TN	0	0	0	14	7	21	11	1	15	35	42	87	232
Full Database	108	134	91	40	168	127	201	131	144	411	716	678	2,951
Full Database With ABB Presence	49	18	21	32	27	44	44	41	52	143	218	328	1,036
Outside High Density Area (Full Database)	6	8	3	6	4	8	9	4	0	0	37	44	129

FIGURE 2. Refined Dataset Map

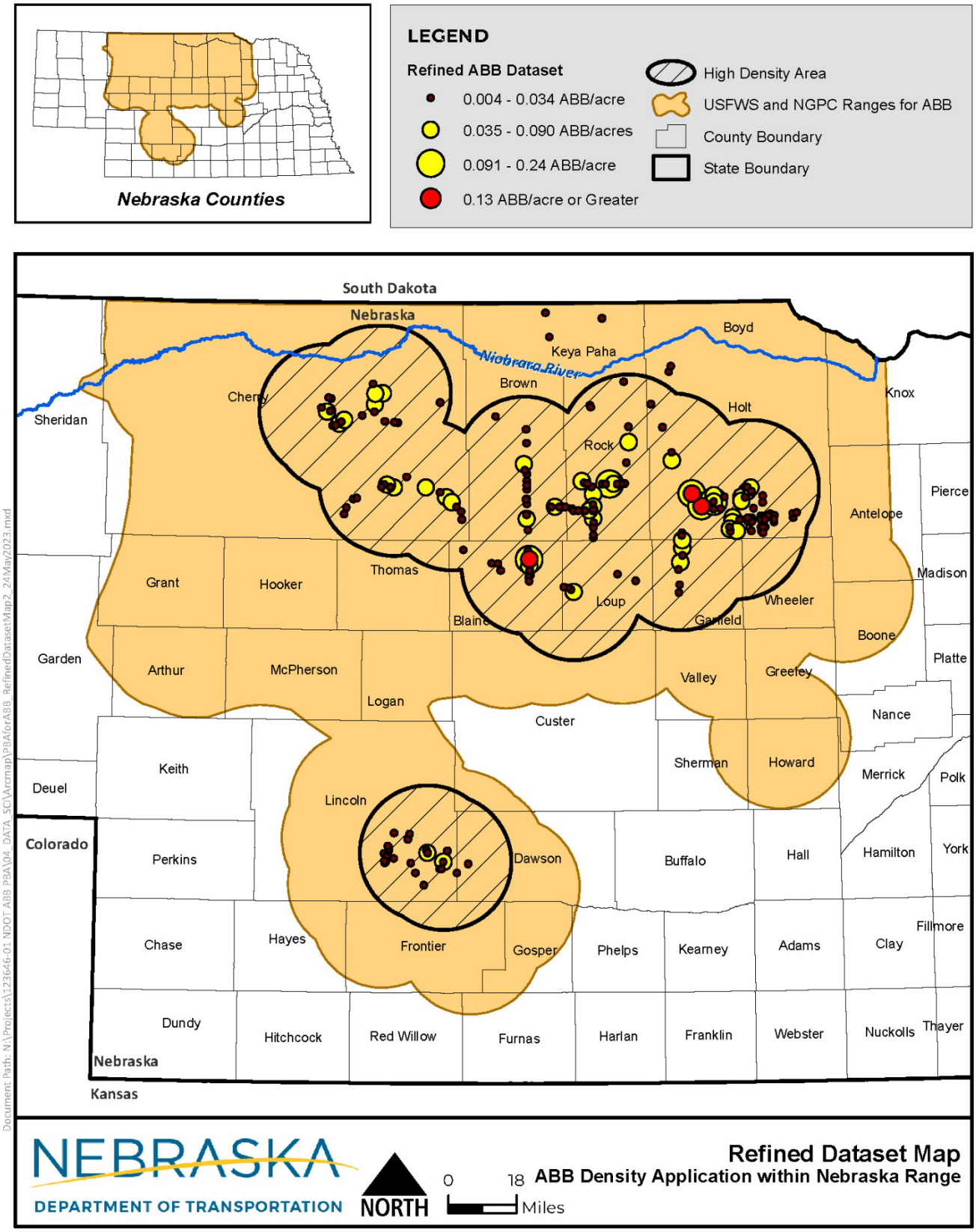


FIGURE 2. Full Database Map

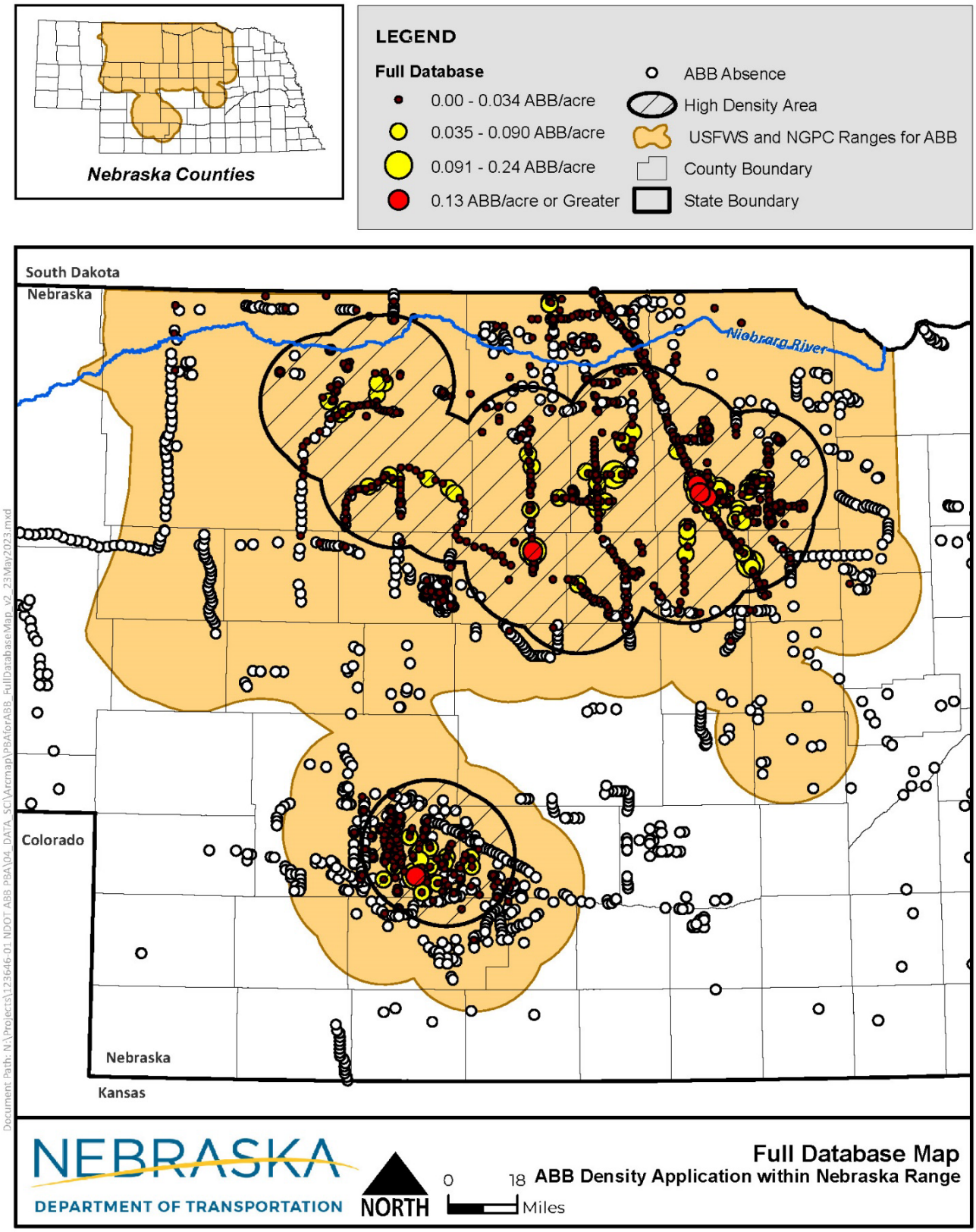
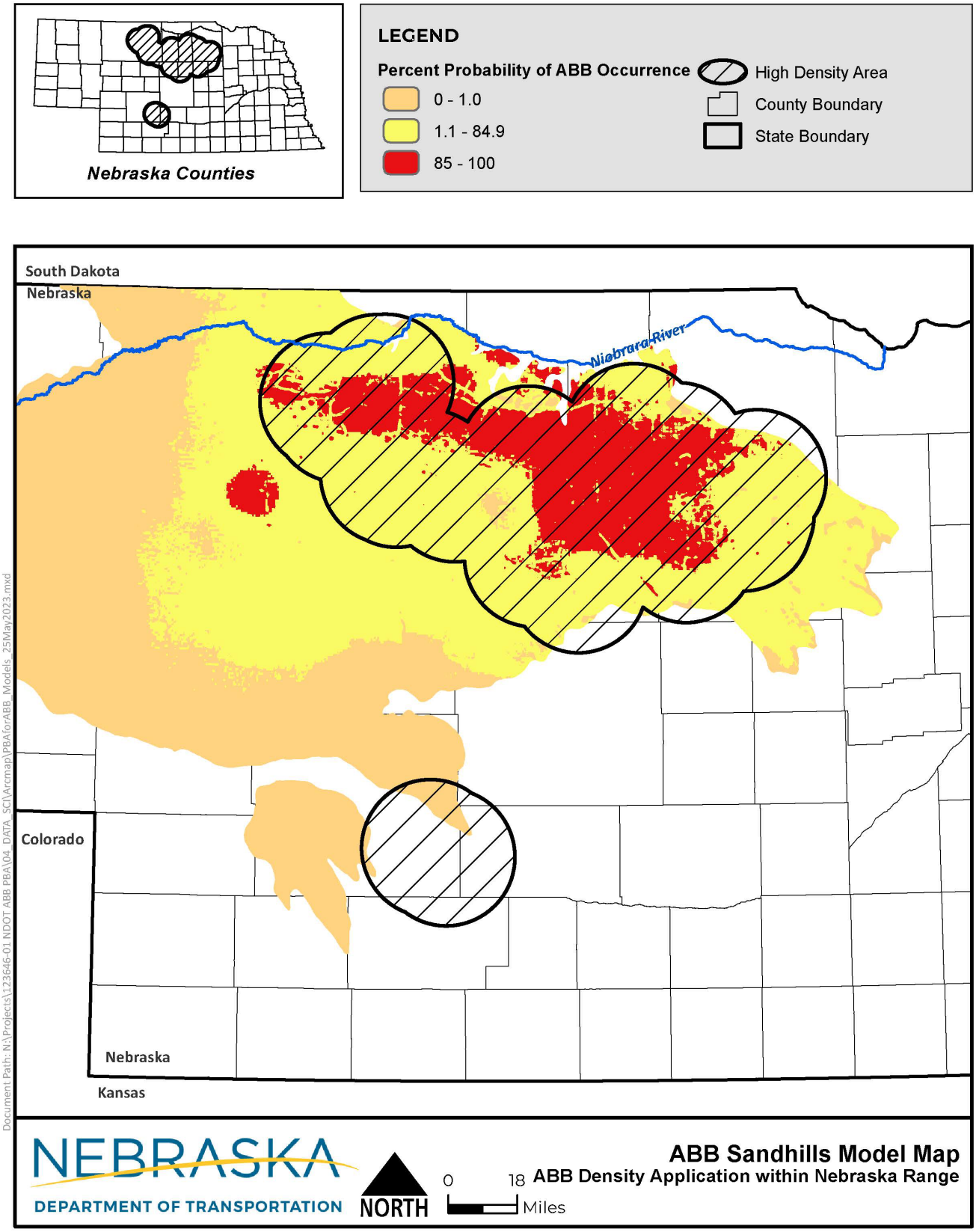


FIGURE 3. ABB Sandhills Model Map



APPENDIX B:

CONSERVATION CONDITIONS FROM THE NEBRASKA BIOLOGICAL EVALUATION PROCESS

Federal and State Listed Species Conservation Conditions (CC), as part of the Nebraska Biological Evaluation Process (as approved on March 20, 2023)

The conservation conditions listed below correspond to the conditions identified in the Federal Species Matrix and State Species Matrix (Matrix) document. A project evaluation through the Matrix identifies which activities require associated conservation conditions (CC's) under the programmatic consultation process. When identified, CC's shall be incorporated into the NEPA decision document, Green Sheet process, construction contract, Overview of Effects and Required Conservation Conditions form (OERCC), and executed in the field. **If CC's for a specific project appear contradictory, the NDOT Biologist will either stipulate in the OERCC form where within the project limits each apply, or will only include the most restrictive CC. Within the notes section of the OERCC, the NDOT Biologist will document which condition was dropped, and the reason why, if applicable**. **In this instance, an IPLE isn't needed**. Following is the list of CC's that are utilized with the Matrix to offset possible impacts.

NOTE: The Matrix and associated findings, and any associated Conservation Condition only apply to species that have been identified by the Species Evaluation Parameters as having a "yes" answer to indicate a planning concern exists. For those species of concern, the Matrix is used to identify the status of impacts for the individual activity/practice being implemented.

1. **<u>General Conservation Conditions for All Projects</u> (Responsible Party for the measure is found in parentheses).** These conditions are numbered beginning with an "A" to designate application to ALL projects.

A-1 **Changes in Project Scope**. If there is a change in the project scope, the project limits, or environmental commitments, the Highway Project Manager shall coordinate with the NDOT Environmental Section to evaluate potential impacts prior to implementation. Environmental commitments are not subject to change without prior written approval from the NDOT Environmental Section. *(District Construction)*

A-2 **Conservation Conditions**. Conservation conditions are to be fully implemented within the project limits as shown on the plans. *(District Construction, Contractor)*

A-3 **Early Construction Starts**. Contractor requests for early construction starts must be coordinated by the Project Construction Engineer with the NDOT Environmental Section for approval to ensure avoidance of listed species sensitive lifecycle timeframes. Early start requests may require consultation with the USFWS and NGPC. Agency coordination time will vary depending on species and project location. *(District Construction, Contractor)*

A-4 **T&E Species**. If federal or state listed species are observed during construction, the Highway Project Manager will contact NDOT Environmental Section to determine if additional species conservation conditions would be required prior to continuing project construction activities. Contact NDOT Environmental for a reference of federal and state listed species. Coordination with the USFWS and NGPC may be required depending on the species identified and construction activities. *(NDOT Environmental, District Construction, Contractor)*

A-5 **Refueling**. Refueling will be conducted outside of those sensitive areas identified on the plans, in the contract, and/or marked in the field. *(Contractor)*

A-6 **Restricted Activities**. The following project activities shall, to the extent possible, be restricted to between the beginning and ending points (stationing, reference posts, mile markers, and/or section-township-range references) of the project, within the right-of-way designated on the project plans: borrow sites, burn sites, construction debris waste disposal areas, concrete and asphalt plants, haul roads, stockpiling areas, staging areas, and material storage sites.

For activities outside the project limits, the contractor should refer to the Nebraska Game and Parks Commission website to determine which species ranges occur within the off-site area. The contractor should plan accordingly for any species surveys that may be required to approve the use of a borrow site, or other off-site activities. The contractor should review the T&E Matrix agreement (on NDOT's website), where species survey protocols can be found, to estimate the level of effort and timing requirements for surveys.

Any project related activities that occur outside of the project limits must be environmentally cleared/permitted with the Nebraska Game and Parks Commission as well as any other appropriate agencies by the contractor and those clearances/permits submitted to the District Construction Project Manager prior to the start of the above listed project activities. The contractor shall submit information such as an aerial photo showing the proposed activity site, a soil survey map with the location of the site, a plan-sheet or drawing showing the location and dimensions of the activity site, a minimum of 4 different ground photos showing the existing conditions at the proposed activity site, depth to ground water and depth of pit, and the "Platte River depletion status" of the site. The contractor must receive notice of acceptance from NDOT environmental, prior to starting the above listed project activities. These project activities cannot adversely affect state and/or federally listed species or designated critical habitat. *(NDOT Environmental, District Construction, Contractor).*

A-7 **Waste/Debris**. Construction waste/debris will be disposed of in areas or a manner that will not adversely affect state and/or federally listed species and/or designated critical habitat. *(Contractor)*

A-8 **Post Construction Erosion Control.** Erosion control activities carried out by NDOT Maintenance or others after construction is complete, but prior to project close-out, shall adhere to any standard conservation conditions for species designated for the project limits during construction. *(NDOT Maintenance, District Construction, Contractor)*

2. **<u>General Conservation Conditions for Specific Impacts/Activities, as applicable</u> (Responsible Party for the measure is found in parentheses).** These conditions are numbered beginning with an "S" to designate application to SPECIFIC impacts or activities.

S-1 **Fencing**. When project-related fence construction/relocation work is required to be done prior to the start of construction, and if the fence work occurs outside urban or cropland areas that

are not within swift fox or mountain plover range, then fencing can be installed/relocated at any time using the following criteria:

a. the fencing is temporary in nature and/or consists of only hand-driven posts
b. the work does not compact the soils (ex. through the use of heavy equipment) or cause soil disturbance beyond the driving of posts
c. within the **whooping crane** migration corridor, work occurring within a half of a mile of wetlands or perennial waters will occur between the hours of 10:00 am to 4:00pm when the work is between March 6 – April 29 or October 9 – November 15

If the fencing work cannot meet these criteria, then NDOT Right-of-Way Division shall coordinate with NDOT Environmental Section prior to the completion of Right-of-way negotiations.

*Once ROW notifies NDOT Environmental, Environmental will check to see if suitable habitat for **American burying beetle, Salt Creek tiger beetle, whooping crane, swift fox, mountain plover, western massasauga,** or any protected **plants** exist in the fencing area. IF the suitable habitat exists, NDOT Environmental shall coordinate with the resource agencies for guidance. If suitable habitat does not exist, then the work would be considered a no effect to listed species. THIS COMMITMENT IS NOT WRITTEN IN THE INDIVIDUAL PROJECT BIOLOGY DOCUMENT; the commitment is located in the NDOT ROW manual.*

S-2 **Platte River Depletions***. If within the Platte River watershed (including the Elkhorn, Salt Creek, Loup, Calamus, and Lower Platte drainage basins) include the following for all detention basin/retention basins, dust control, and borrow sites:*

To the maximum extent practical, efforts will be made to design the project and select borrow sites to prevent depletions to the Platte River. If there is any potential to create a depletion, NDOT (during design) and the Contractor (for borrow sites) shall follow the current Platte River depletion protocols for coordination, minimization, and mitigation. In general, the following are considered de minimis depletions, but may still require agency coordination; a project which: a) creates an annual depletion less than 0.1 acre feet, b) creates a detention basin that detains water for less than 72 hours, c) diverted water that will be returned to its natural basin within 30 days, or d) creates a one-time depletion of less than 10 acre feet. *(NDOT Roadway Design, Contractor)*

S-3 **Revegetation**. All permanent seeding and plantings (excluding managed landscaped areas) shall use species and composition native to the project vicinity as shown in the Plan for the Roadside Environment. However, within the first 16 feet of the road shoulder or within high erosion prone locations, tall fescue or perennial ryegrass may be used at minimal rates to provide quick groundcover to prevent erosion, unless state or federally listed threatened or endangered plants were identified in the project area during surveys. If listed **plants** were identified, any seed mix requirements identified during resource agency consultations shall be used for the project. (*NDOT Environmental*)

S-4 **Sensitive Areas.** Environmentally Sensitive Areas will be marked on the plans, in the field, or in the contract by NDOT Environmental for avoidance. *(NDOT Environmental, NDOT Roadway Design, District Construction)*

S-5 **Species Surveys.** If species surveys are required during the construction phase of the project (including pre-construction surveys), results will be sent by NDOT Environmental Section to the USFWS, NGPC, and if applicable the USACE. (NDOT Environmental, District Construction)

S-6 **Permanent LED Lighting (<u>NDOT Design Commitment</u>):** Only LED roadway luminaries listed on the NDOT "Nebraska Qualified Material Vendors List" will be considered for use on Nebraska highway lighting projects. Proposed changes to the following LED lighting requirements would require resource agency (USFWS and/or NGPC) coordination and approval prior to installation:

- Nominal CCT – 3000 +/- 300 K
- BUG Ratings – Maximum nominal Backlight (N/A), Uplight (0), Glare (N/A)
- Lumen Output – N/A

Any proposed changes to the listed requirement(s) must be presented to the NDOT Environmental Section for Agency Coordination and approval.

3. **<u>Standard Conservation Conditions for Range</u> (Responsible Party for the measure is found in parentheses).** When project work occurs within the range of the species listed below, and habitat is present according to Step 2: Habitat Evaluation on the SEP form, the following measures will be incorporated into project contracts, the Green Sheet, the NEPA document and the Overview of Effects and required Conservation Conditions because they apply to every project within that area. These conditions are numbered beginning with an "R" to designate application to RANGE.

R-1 For activities within the **American burying beetle** range, asphalt plants and staging areas for construction supplies and Contractor's equipment shall be located in areas that are frequently disturbed such as, but not limited to, field entrances, crop fields, abandoned roadway, farmsteads, and roads. If this is not possible, the contractor shall coordinate with NDOT Environmental with a site plan showing the desired staging/stockpile location(s), which will be sited in such a way as to avoid impacting protected species. *(Contractor)*

APPENDIX C:

HABITAT ASSESSMENT MAPPING

NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION

Habitat Assessment Mapping to Estimate Impacts to Suitable Habitat for the American Burying Beetle

NDOT will provide the following information:

- Project Description (NDOT Form 182)
- Project Design files (preferably in .KMZ format for easier sharing):
    - Survey/Topography data (to include existing roadway extents and structures, which may sometimes be labeled as 'cp' files)
    - Proposed design (to include future roadway extents and construction activities, which may sometimes be labeled as 'cf' files)
- Toe-of-Foreslope Offset for State projects (preferably in .KMZ format for easier sharing)

Design Consultant or Local Public Agency (LPA) Engineer will provide the following information for LPA projects:

- Project Design files (preferably in .KMZ format for easier sharing):
    - Survey/Topography data (to include existing roadway extents and structures, which may sometimes be labeled as 'cp' files)
    - Proposed design (to include future roadway extents and construction activities, which may sometimes be labeled as 'cf' files)
- Toe-of-Foreslope
    - Preferably in .KMZ format, if possible
    - Some rural local roads (i.e., country roads) do not have typical cross sections, toe-of-foreslope should be estimated using the survey/topography data

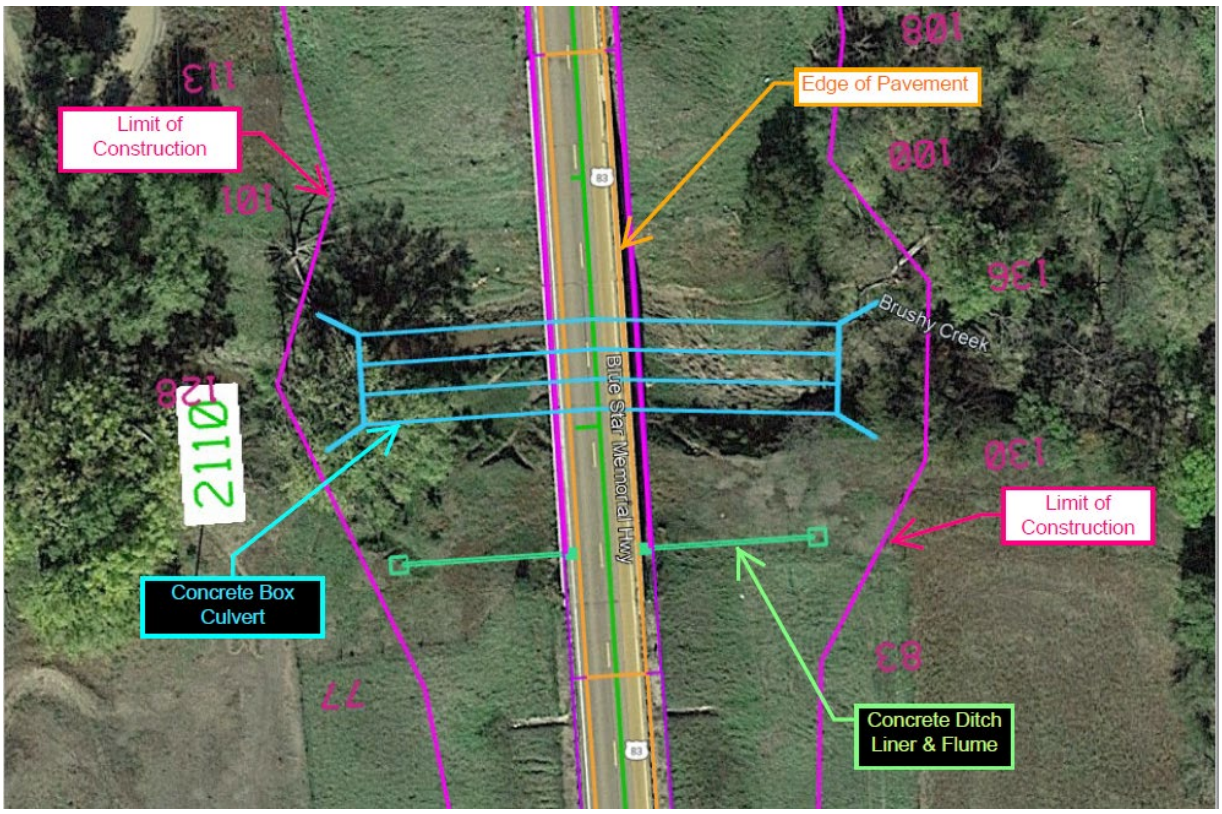
NDOT T&E Biologist or Environmental Consultant (qualified for T&E reviews) will provide the following deliverables to NDOT for the project file or further instructions for compensatory mitigation steps:

- .KMZ with the following information
    - Limits of construction (LOC) and Toe-of-Foreslope Extents
    - Habitat suitability determinations
- ABB Habitat Suitability Determination Excel Table
- ABB Project Evaluation Form (NDOT Form xxxx [TBD]), see separate form for instructions

Evaluate Project Design Files and Project Description

First step is to evaluate the provided project design files within an aerial imagery viewer (i.e., in Google Earth or other mapping applications, such as, ArcMap, ArcGIS Pro, CADD, Microstation, etc.) against the Project Description in order to ensure you have a sufficient level of information. An illustration of this type of review is provided in Figure 1. For example, if a concrete box culvert replacement is described in the Project Description, then there should be linework for a concrete box culvert in the provided files. Project design files for the proposed design should have linework delineating the LOC. Project design files for the survey/topography data should also include linework identifying edge of pavement or edge of shoulder, which can be visually evaluated using aerial imagery.

Figure 1. Example of aerial review of project design files, which should be compared to the Project Description.

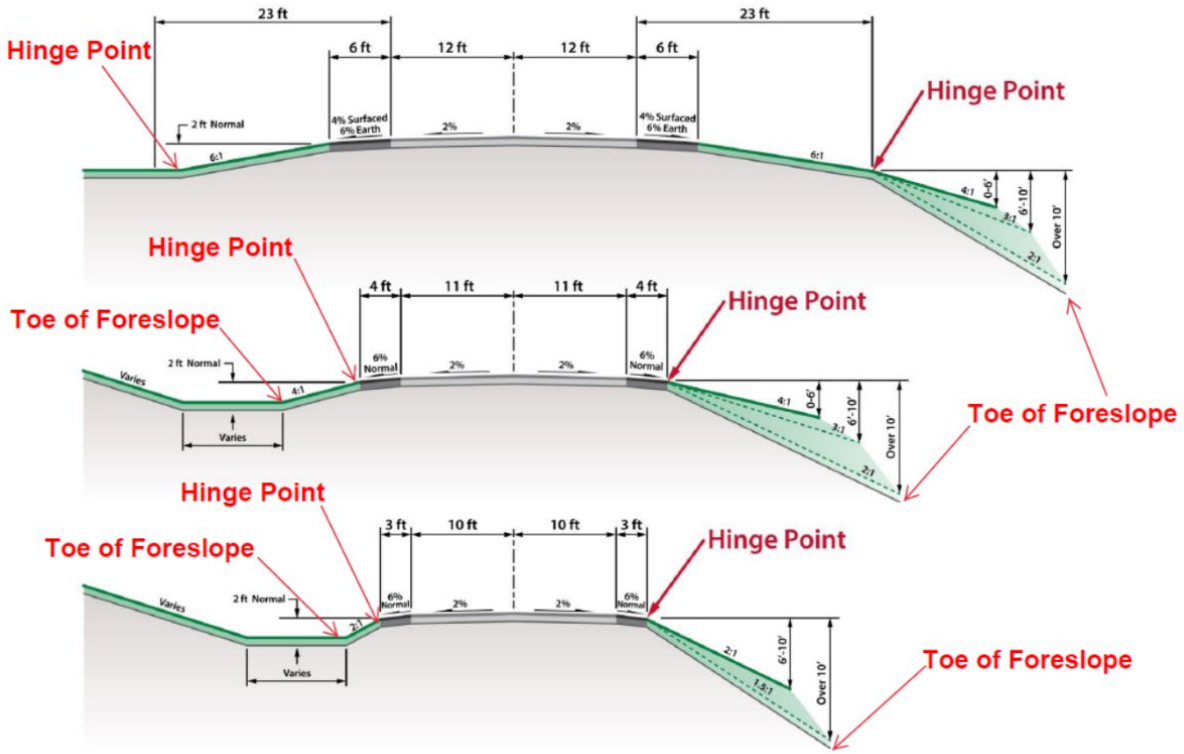


LOC and Toe of Foreslope Extents

After confirming the provided project design files illustrate the relevant project activities and existing conditions, then draft or incorporate the LOC and toe of foreslope extents into your mapping application (e.g., ArcMap, ArcGIS Pro, CADD, Microstation, etc). The LOC should be provided as linework in project design files for the proposed design. If not, then it needs to be requested and provided by NDOT, the Design Consultant, or LPA engineers. The LOC linework would be used to draft a new shapefile for the LOC, also referred to as the Area of Disturbance.

The toe of foreslope is defined as the transition between engineered soil base to native soil, which is generally where the foreslope meets the bottom of the roadside ditch. Generally, the foreslope is a 3:1 slope from the hinge point to the bottom of the roadside ditch, but slope and width of foreslope will be variable between and within projects. NDOT, Design Consultants, or LPA Engineers will assess relevant as-builts and either provide the consultant the toe of foreslope as a certain foot offset from edge of pavement or edge of shoulder or an electronic line file (i.e., .kmz, .dgn, or shapefile) based on survey/topography data. The edge of pavement could then be buffered by the specified length in order to get the extents of the toe of foreslope. For example, the toe of foreslope in the first cross section of the above graphic would be 41 feet from edge of roadway, if the foreslope is at a 3:1 slope and the change in vertical depth is 6 feet (Figure 2).

Figure 2. General cross sections of roadways. Example of Toe of Foreslope distances from the edge of the roadway, shoulder, or hinge point.



Habitat Suitability Determination

Habitat evaluation must occur for all areas within the LOC. However, pavement and gravel roadway surfaces would not be mapped because they consist of unsuitable habitat. NDOT's stance is the definition of a roadway is the constructed roadway prism from the toe-of-foreslope to the toe-of-foreslope. The roadway prism is exposed to salt from snow removal activities, subject to heavy disturbances or repeated compaction, and is typically mowed multiple times during the growing season, which limits ground cover and decreases soil moisture retention. Similarly, the soil compaction and higher soil salinity leads to difficulty in establishing vegetation on shoulders and down the foreslope (Li et. al., 2016). Compacted roadway foreslopes reduces infiltration rates and soil moisture due to reduced air voids in soil structure. Therefore, roadway foreslope generally contains drier soils than the bottom of the ditch due to fill material, compaction (as described in the previous sentence), and slope. Within the roadway prism, the increased soil compaction, lower soil moisture, unfavorable soil composition (i.e., increased salinity and decreased organic matter), and altered soil structure likely reduces the ability of ABBs to bury a carcass, and the additional lack of vegetative cover reduces the probability of ABB taking refuge (USFWS, 2019). Overall, these characteristics support that the edge of roadway surface (i.e., concrete, asphalt, or gravel) to the toe-of-foreslope is unfavorable habitat for ABB.

Most areas outside the toe of foreslope are considered suitable habitat (unless they meet the unsuitable or unfavorable descriptions in the NDOT ABB programmatic BA/BO). These suitable areas could provide habitat for ABB, support critical portions of the ABB life cycle, or help support potential food resources. For example, areas adjacent to wetlands and/or riparian areas are

considered suitable for ABB, as they may be important for individuals seeking moist soils during dry conditions.

However, areas within the LOC but outside of the toe of foreslope not meeting the above definitions for unfavorable habitat (e.g., grassy ditch bottom and backslope) may be considered unfavorable habitat. This depends on proximity to adjacent unfavorable habitat, length of adjacent unfavorable habitat, and type of unfavorable habitat (e.g., areas around standing water wetlands are less likely to be call unfavorable). If it is a patchwork of suitable and unfavorable habitat or only one side of the road has unfavorable habitat, then the area should not be considered unfavorable.

After determining which habitat is suitable versus unfavorable, impact classifications must be made. In general, permanent impacts are defined as any conversion of habitat to a hard surface such as pavement, flume structures, gravels, or riprap. Temporary impacts occur in areas that would be restored to their previous condition with native grasses or would not result in permanent habitat conversion upon project completion. Restoration activities involve the conversion of previously unsuitable or unfavorable habitat to potentially suitable habitat. For example, removing a concrete flume and not replacing it, thus allowing the area to be recolonized by native vegetation.

Evaluating the provided project design files against the Project Description will allow for a determination of permanent versus temporary impacts. Below are examples of activities that incur permanent and / or temporary impacts.

Examples of permanent impacts include:

- Bank Stabilization (above ordinary high water mark)
- Channel Grade Stabilization Structures
- Channelization Activities (assuming areas above ordinary high water mark are impacted)
- Culvert New, Replacement, Extension, Repair (Permanent if culvert is a new structure and not replacing old structure. If culvert replacement / extension has a larger footprint than the original structure, the newly impacted area beyond the original structure's footprint would be considered a permanent impact)
- Detention Basin
- Erosion control activities with biodegradable materials that take longer than 5 years to dissipate
- Landscaping
- New Curb and Flume or Curb and Gutter Installation
- New Pavement Installation
- Guardrail Repair, Replacement, or Installation with Soil Disturbance
- Noise Walls
- Retaining Walls
- Replacing a Bridge with a Culvert
- Stream Channel Impact

Examples of temporary impacts include:

- Temporary Access Roads
- Bridge Deck Repair / Replacement / Painting
- Bridge Rail Repair / Replacement
- Bridge Substructure / Superstructure work
- Clearing & Grubbing Activities if not associated with a permanent impact

activity (and marked for plant re-seeding)
- Concrete Pavement Repair
- Culvert New, Replacement, Extension, Repair (if culvert is merely replacing old structure within the same footprint.)
- Earth Shoulder Construction
- Erosion Control Activities (unless biodegradable materials take longer than 5 years to dissipate)
- Grading Outside the Hinge Point
- Lighting, Traffic and Pedestrian Signals, Dynamic Message Signs w/ soil disturbance
- Shoo-fly
- Signs with Soil Disturbance
- Temporary Crossing, Causeway, Work Platform
- Trenched Widening
- Underground Utility Conduit Installation

Examples of impacts likely to be limited to the roadway prism and would be mapped within unfavorable habitat (or not mapped at all if wholly within unsuitable habitat) include:

- Asphalt Patching
- Crack Sealing / Joint Sealing
- Grading Within the Hinge Point

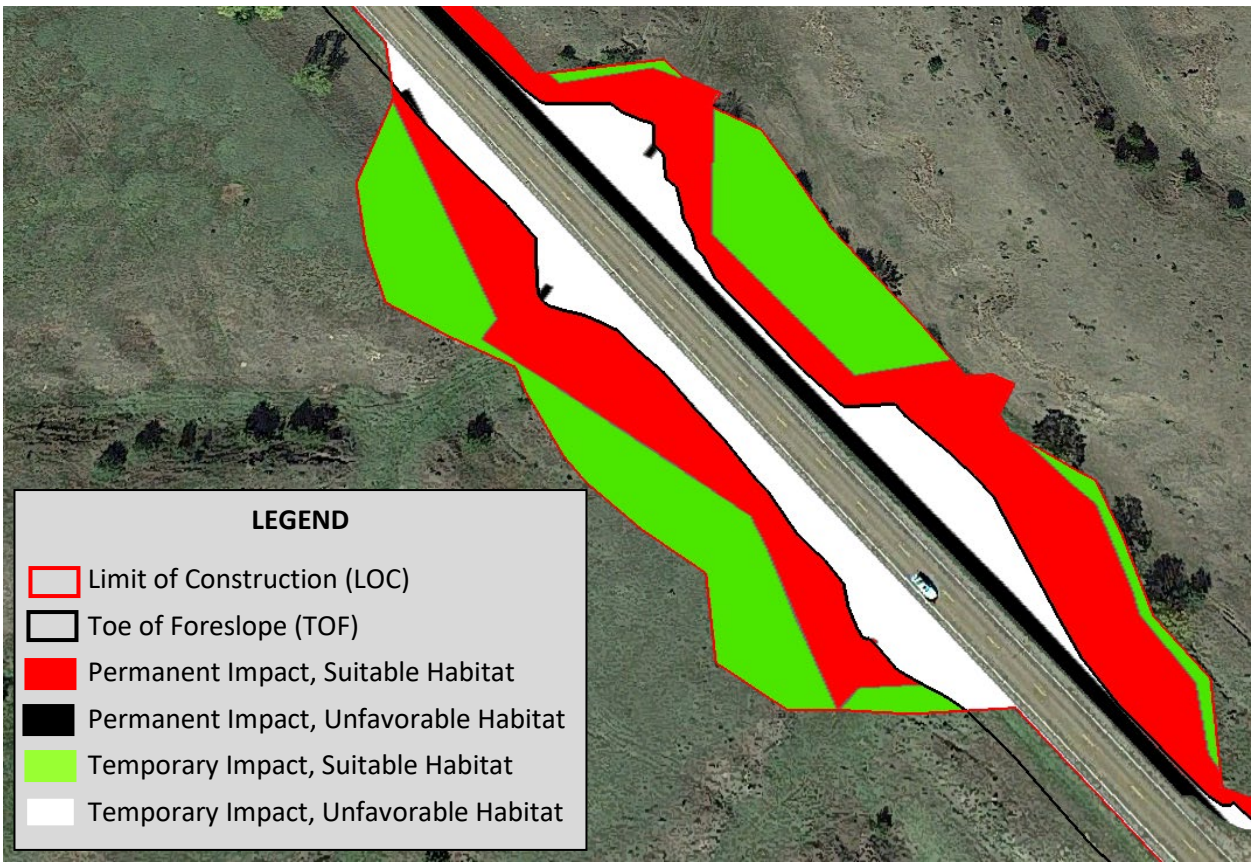
The following five categories must be determined, and associated acreages calculated within the LOC:

1. Permanent Impacts to Suitable Habitat
2. Permanent Impacts to Unfavorable Habitat
3. Temporary Impacts to Suitable Habitat
4. Temporary Impacts to Unfavorable Habitat
5. Restoration (if applicable)

If there is any question on the impact type for a particular construction activity listed in the project design files and Project Description, please consult NDOT for further guidance.

As the below graphic shows (Figure 3), everything within the toe of foreslope is considered unfavorable habitat. In this particular location, all areas outside of the toe of foreslope, but within the LOC, were considered suitable habitat. Permanent impacts are associated with the culvert and concrete ditch liner / flume work. The area outside of the structure locations to the extents of the LOC are considered temporary impacts. Colors used on Figure 3 should be used for .kmz deliverable.

Figure 3. Example of habitat assessment mapping.



Definitions for NDOT ABB Habitat Assessment Mapping and Estimation of Potential Incidental Take:

ABB 4(d) rule = a final 4(d) rule (85 FR 200) was published for ABB on October 15, 2020 (effective November 16, 2020) (hereafter referred to as ABB 4(d) rule). The ABB 4(d) rule specifies what constitutes prohibited taking of ABB and provides exceptions from take prohibitions.

ABB unfavorable habitat = classification of abutting soils beyond the right-of-way (ROW) without the appropriate abiotic elements (see ABB suitable habitat) or ability to support ABB life functions. Regularly tilled agricultural lands (including row-crop agriculture), wetlands, urban areas with maintained lawns, stockpiled soil without vegetation, land with no topsoil/leaf litter/ vegetation would qualify as unfavorable habitat. Unfavorable wetlands would likely be identified in a wetland delineation as palustrine emergent semi-permanently flooded (PEMF) or palustrine aquatic bed (PAB) wetlands. Additionally, the probability of ABB presence may decrease near agricultural areas where over 73 percent of the surrounding area is row-crop agriculture (Jurzenski et al. 2014). Vegetation regularly mowed and maintained below eight inches (e.g., lawns or pasture/grassland maintained through frequent mowing, grazing, or herbicide application) would also be unfavorable habitat. These definitions are specifically defined in the ABB 4(d) Determination Key Definitions as follows:

1. Land that is tilled on a regular basis, planted in monoculture, and does not contain native vegetation.

2. Pasture or grassland that has been maintained through frequent mowing, grazing, or herbicide application at a height of 20 cm (8 inches) or less.

3. Land that has already been developed and no longer exhibits topsoil, leaf litter, or vegetation.

4. Urban areas with maintained lawns, paved surfaces, or roadways.

5. Stockpiled soil without vegetation.

6. Wetlands or permanent waterbodies with standing water or saturated soils. Areas adjacent to wetlands and/or riparian areas are not considered unfavorable for the ABB, as they may be important for ABBs seeking moist soils during dry conditions.

(if an area has already been classified as unsuitable habitat, then the above would no longer apply and would not change the area to unfavorable)

NDOT has worked with USFWS and NGPC to further refine the definition of a roadway, as included in #4 above. The roadway as defined in this BA is the constructed roadway prism from the toe-of-foreslope to the toe-of-foreslope. Other areas within the project limits (outside of the toe-of-foreslope) may also be considered unfavorable habitat. This depends on proximity to adjacent unfavorable habitat, length of adjacent unfavorable habitat, and type of unfavorable habitat (e.g., areas around standing water wetlands are less likely to be called unfavorable). If it is a patchwork of suitable and unfavorable habitat or only one side of the road has unfavorable habitat, then the area should not be considered unfavorable.

ABB unsuitable habitat = unsuitable habitat for ABB generally includes “land cover types that do not provide habitat that would be favorable for any portion of the ABB life cycle (such as open water or highly developed urban lands)” (ABB Species Status Assessment, 2019 and Intra-Service Section 7 biological opinion on reclassifying the American burying beetle (*Nicrophorus americanus*) from endangered to threatened on the federal list of endangered and threatened wildlife with a 4(d) Rule, Final Rule, 2020). Various sections of the Species Status Assessment provide information about unsuitable habitat. This information is paraphrased as the

following: areas permanently inundated with water (i.e., stream/river channels and ponds [sometimes identified as palustrine unconsolidated bottom (PUB) water resources]), paved areas such as asphalt or concrete roadway and driveways, and frequently compacted soil or gravel surfaces such as field access drives and gravel roadways. Urban areas consisting of all paved or hard surfaces and areas lacking vegetation would also be considered unsuitable habitat.

ABB suitable habitat = as defined by Provisions of the ABB 4(d) rule, are "areas where suitable soils contain the appropriate abiotic elements (e.g., soil temperature, soil moisture, particle size, etc.) that are favorable for excavation and formation of brood chambers and where appropriate carrion for reproduction is available". Most areas outside the toe-of-foreslope are considered suitable habitat (unless they meet the unsuitable or unfavorable descriptions described above). These suitable areas could provide habitat for ABB, support critical portions of the ABB life cycle, or help support potential food resources.

Impacted ABB suitable habitat = calculation of area of permanent and temporary soil disturbance impacts that are outside the toe-of-foreslope and within the limits of construction (LOC).

Permanent impacts = soil disturbance that eliminates ABB habitat or takes more than 5 years to re-establish as suitable for ABB use.

Roadway foreslope = portion of the roadway prism from the hinge point that transitions from the shoulder safety section to the flat bottom ditch or existing ground. Foreslopes are generally 3:1, but steepness and width can vary between and within projects (see Figure 2).

Roadway prism = the constructed roadway including the roadway surface, shoulders, and foreslope / embankment. Toe-of-foreslope to toe-of-foreslope (see Figure 2).

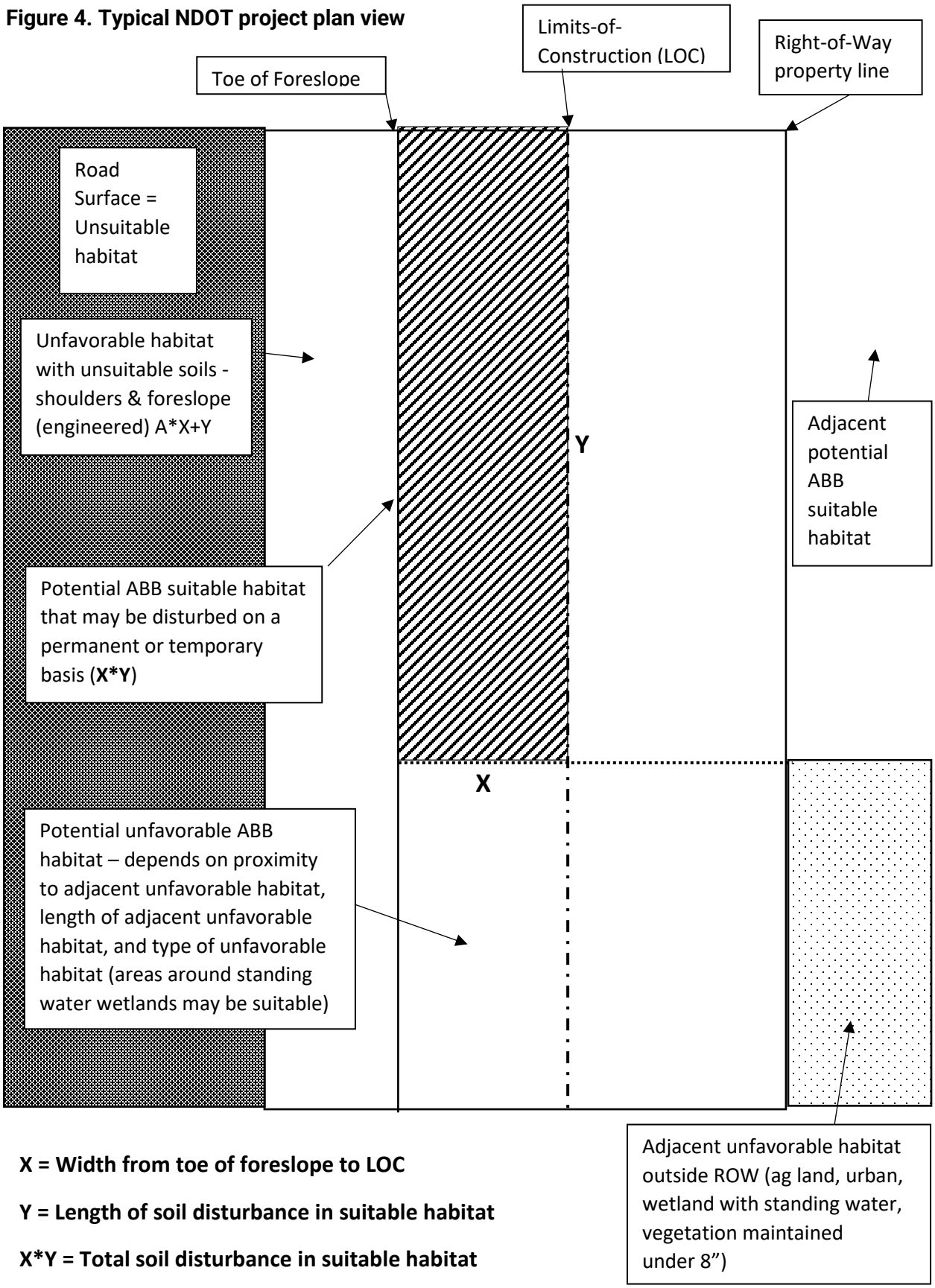
Roadway surface = footprint of the road including pavement, asphalt, and gravel (Figure 2 and 4).

Soil disturbance = movement or alteration of soil associated with modifying the existing land use. Includes grading, filling, excavating, topsoil stripping, and chemical treatment (soil sterilizer, pesticides, or herbicides).

Temporary impacts (or Temporary soil disturbance) = activities or actions that alter or remove ABB habitat after which the disturbed area is restored to a condition suitable for ABB use within five years of the original activities. Temporary impacts would not convert suitable habitat to unfavorable habitat.

Toe of foreslope = the compaction and composition transition between engineered soil base to native soil. Generally, a 3:1 slope, but slope and width of foreslope will be variable between and within projects (see Figure 2 and 4).

Figure 4. Typical NDOT project plan view



X = Width from toe of foreslope to LOC

Y = Length of soil disturbance in suitable habitat

X*Y = Total soil disturbance in suitable habitat

Estimating Soil Disturbance for ABB Project Evaluation Form

All soil disturbance that occurs in unfavorable and suitable habitat have the potential for incidental take of ABB. Under the 4(d) rule, incidental take would not be prohibited in unfavorable habitat, but is prohibited in suitable habitat (for most instances of NDOT or LPA roadway projects, unless specific to wildlife management activities). Whether soils are permanently or temporarily disturbed does not affect the potential for incidental take related to the construction of the project. However, the amount of suitable habitat permanently lost versus temporarily disturbed is used to calculate different mitigation ratios. Permanently lost areas are mitigated at a higher ratio than temporarily disturbed area.

A view of the typical NDOT project plan view showing areas pertinent to estimating the potential prohibited incidental take for projects in ABB range is shown by Figure 4. For simplified steps to estimate potential prohibited incidental take, calculate the area (acres) of soils located in suitable ABB habitat that will be disturbed (impacted) by the project(s). This will include the area of suitable habitat outside the toe of the foreslope and within the limits of construction (LOC) (width "X"), and laterally the length of the project (length "Y"). Ideally, acres of disturbance would be calculated in a mapping application. Habitat evaluation and soil disturbances may be presented as shown by Table 1. The information in Table 1 will be provided in the ABB Project Evaluation Form (NDOT xxx [TBD]).

Table 1. Example of table to show habitat evaluation and soil disturbance types.

Description of Analysis	Results
Total Permanent impact to Suitable Habitat (acres)	
Total Temporary impact to Suitable Habitat (acres)	
Total Permanent impact to Unfavorable Habitat (acres)	
Total Temporary impact to Unfavorable Habitat (acres)	
Total Soil Disturbance (acres)	
Total Permanent and Temporary Soil Disturbance in Suitable Habitat (acres)	

The completion of the ABB Project Evaluation Form (NDOT xxx [TBD]) using the habitat mapping results will be part of the overall NDOT T&E biological assessment review and inform the Overview of Effects and Required Conservation Conditions (OERCC).

References

Li, X., M. Mamo, W. Schacht, T. Awada, and H. Blanko. 2016. Identifying and addressing soil property issues affecting roadside vegetation establishment. Nebraska Department of Roads – Research Report.

Nebraska Department of Transportation (NDOT). 2017. Standard Specification for Highway Construction. Accessible: https://dot.nebraska.gov/media/g4qp4y0d/2017-specbook.pdf.

Nebraska Department of Transportation (NDOT). 2022. Roadway design manual. Accessible: https://dot.nebraska.gov/media/gnwk21cs/rdm.pdf.

Nebraska Department of Transportation (NDOT). 2023. NDOT Roadside Vegetation Establishment and Management. Accessible: https://dot.nebraska.gov/media/4016/veg-manual.pdf.

U.S. Fish and Wildlife Service (USFWS). 2018. American burying beetle (Nicrophorus americanus) range-wide presence/absence survey guidance. Accessible (as of July 12, 2023): https://www.fws.gov/media/american-burying-beetle-rangewide-survey-guidance-may-2018.

U.S. Fish and Wildlife Service (USFWS). 2019. Species status assessment report for the American burying beetle. Version 1.0. Accessible (as of April 19, 2022): https://ecos.fws.gov/ServCat/DownloadFile/165011.

U.S. Fish and Wildlife Service (USFWS). 2020a. Endangered and Threatened Wildlife and Plants; Reclassification of the American Burying Beetle From Endangered to Threatened With a Section 4(d) Rule. Federal Register Vol. 85, No. 200, October 15, 2020.

U.S. Fish and Wildlife Service (USFWS). 2020b. Intra-Service Section 7 biological opinion on reclassifying the American burying beetle (Nicrophorus americanus) from endangered to threatened on the federal list of endangered and threatened wildlife with a 4(d) Rule, Final Rule. Accessible: https://www.fws.gov/sites/default/files/documents/Intra%20Service%20Section%207%20Biological%20Opinion%20Reclassifying%20American%20Burying%20Beetle%20From%20Endangered%20to%20Threatened.pdf.

U.S. Fish and Wildlife Service (USFWS). 2020c. Reclassification of the American burying beetle from endangered to threatened with a Section 4(d) Rule. Accessible (as of November 16, 2022): https://www.fws.gov/species-publication-action/reclassification-american-burying-beetle-endangered-threatened-section.

APPENDIX D:

ABB PROJECT EVALUATION FORM
(TEMPLATE AND INSTRUCTIONS)

NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION

ABB Project Evaluation Form

(Instruction Template)

Project Development Division

Project Name:	Project No.:	Control No.:
Project Location (City, if applicable and County):		
Initial Draft Date:	Written By:	
Approval Date:	Approved By:	

Instructions: Green text represents notes, guidance, or examples to aid with the completion of this document. Green text shall be deleted from the draft or final versions of this document. Black text represents standard statements used for particular types of work or situations. Do not remove black text from this document. The Nebraska Biological Evaluation Process determines when this form is needed by utilizing the Project Action Area (generally a 1.1-mile buffer) to determine if the project is within the range of ABB.

Complete the below sections to determine the appropriate Determination of Effects for the American burying beetle (ABB), per the NDOT ABB Programmatic Consultation (USFWS and NGPC Biological Opinion[s]) (NDOT ABB PBA 2025).

OPTION 1:

<u>DETERMINATION OF EFFECT:</u> PROJECT WOULD HAVE 'NO EFFECT' ON ABB OR ITS HABITAT. NO AVOIDANCE AND MINIMIZATION MEASURES (AMMs) ARE REQUIRED.

Check all boxes that apply to this project:

☐ No effect - project is located entirely within unsuitable habitat (i.e., some urban projects).

Complete a review of aerial imagery to determine if the project is entirely within unsuitable habitat. Project must have estimated project limits (based on limits of construction) to complete this step. Urban areas and unsuitable habitat are defined in the NDOT ABB PBA/PBO. This would also be checked for pavement preservation projects that will not disturb soil outside of the surfaced roadway or surfaced shoulders. If unfavorable habitat (i.e., manicured grassy lawns) is present then proceed to the next step (and do not check this box).

If the above box is checked, then evaluation is complete, and the remainder of the form can remain blank.

If the above box is not checked, then proceed to OPTION 2 and review for applicability.

OPTION 2:

<u>DETERMINATION OF EFFECT:</u> PROJECT MAY AFFECT BUT IS NOT LIKELY TO ADVERSELY AFFECT (NLAA) ABB OR ITS HABITAT. HABITAT MAPPING IS NOT REQUIRED. AMMs ARE REQUIRED.

Incidental take of ABB is <u>not</u> reasonably certain to occur for these projects, per the NDOT ABB PBA/PBO (2025). Application of the ABB 4(d) rule is not needed. If the project is not an ITS project and a survey was not completed, then proceed to the next step (and do not check either of these boxes).

☐ NLAA – project is for Intelligent Transportation Systems (ITS).

ITS projects are associated with the installation/repair/replacement of infrastructure (i.e., concrete footing, concrete pad, and pole) for closed-circuit television (CCTV) cameras, monitors, electronic messaging signs, fiber-optic cables, variable speed advisory sign systems, and other wireless communication technologies to be used as part of ITS.

☐ NLAA – no ABB were captured in an ABB presence/absence survey (following USFWS survey guidance).

Survey dates:

Number of ABB capture in control trap(s):

Survey notes:

NDOT T&E Biologists (Technical Resources Unit) will determine if an ABB survey is warranted. These will be completed in areas outside of the high density area as defined in the NDOT ABB PBA/PBO; shapefile of the high density area boundary should be provided by NDOT.

With the implementation of AMMs, potential adverse effects would be reduced to levels that are insignificant or discountable; therefore, this project may affect but is not likely to adversely affect (NLAA) ABB or its habitat.

If any of the above OPTION 2 boxes are checked, then evaluation is complete. The following AMMs will be required for the project and should be copied and pasted into the OERCC form:

ABB-1 NDOT shall include a factsheet with the NDOT Status of Environmental Commitments focused on identifying the American burying beetle, explaining its life history, current range, and habitat requirements. Information about the legal protections and AMMs shall be included. Construction personnel shall be instructed to report any sightings of American burying beetle or brood chambers if encountered. (NDOT Environmental)

ABB-2 Contractor use sites (e.g., borrow areas, asphalt plants, and staging areas) shall be located in areas that are frequently disturbed such as, but not limited to, field entrances, crop fields, abandoned roadway, farmsteads, and roads. If this is not possible, the contractor shall coordinate with NDOT Environmental with a site plan showing the desired contractor use site location(s), which will be sited in such a way as to avoid or minimize soil disturbance in suitable habitat. (Contractor, NDOT Environmental [RDCU])

ABB-3 All phases and aspects of the project shall be modified, to the extent practicable, to avoid soil disturbance in excess of what is required to implement the project safely. Soil disturbance shall be limited to areas specified in the project plans. (Design and Contractor)

ABB-4 Erosion and sediment control techniques such as mulching, silt fencing, wattles, and other efforts shall be used to prevent washing away of topsoil, formation of gullies, or other erosion that could negatively affect American burying beetle habitat through the action of surface water. (Design and Contractor)

ABB-5 Nighttime work with lights or temporary construction lighting are not authorized from May 1 to September 30. If nighttime or temporary lighting is requested and approved during this timeframe, then the lighting shall be limited to a Nominal CCT of 3000 +/- 300 K, down shielded (i.e., directional shielding to focus the lighting onto the driving surface), and directed away from suitable habitat. Lighting shall be limited to the extent necessary to meet safety requirements. (Design and Contractor)

ABB-6 If the project has a temporary work crossing/causeway/platform for channel work or bank stabilization activities, then implement the following: After completion of construction activities, the contractor shall remove any temporary fill and construction debris from the channel and surrounding uplands. Temporarily disturbed upland or wetland areas shall be reseeded with native seed mix and channel vegetation shall be allowed to recolonize. (Design and Contractor)

ABB-7 Areas of temporary soils disturbance shall be restored. Restoration of permanent vegetative cover shall be determined successful when the absolute cover is at least 75 percent. Erosion of the disturbed area shall be equal to or less than the surrounding area when gullying, headcutting, slumping, and deep or excessive filling is not observed. The site shall be free of noxious weeds unless the weeds were present at the site prior to construction or are present in surrounding areas. If the vegetative cover requirement is not met within the two-year monitoring period, then re-seeding and repairs shall continue to follow the NDOT guidance until the standards are met. (Design, Contractor, NDOT Environmental)

If none of the OPTION 1 or OPTION 2 boxes are checked, then proceed to OPTION 3 and review for applicability.

OPTION 3:

<u>DETERMINATION OF EFFECT:</u> PROJECT MAY AFFECT AND IS LIKELY TO ADVERSELY AFFECT (LAA) ABB OR ITS HABITAT BUT INCIDENTAL TAKE IS EXCEPTED FROM PROHIBITIONS LISTED IN THE ABB 4(d) RULE. AMMs ARE REQUIRED. HABITAT MAPPING IS NOT REQUIRED.

If the project is not a site development project, then proceed to the next step (and do not check this box).

☐ LAA – project is site development for a mitigation property.

Site development projects consist of properties developed for compensatory mitigation required for Clean Water Act Section 404 permits, other restoration pursuits, or permittee-responsible mitigation (e.g., ABB compensatory mitigation lands). Site development projects for mitigation lands would be considered wildlife management activities. Relative to soil disturbing activities proposed for potential future mitigation sites, the ABB 4(d) rule excepts prohibited incidental take associated with wildlife management activities for state agencies, such as NDOT. Therefore, this incidental take is excepted and does not need to be mitigated.

With the implementation of AMMs and future beneficial effects to ABB survival and propagation, potential adverse effects would be reduced but incidental take may occur; therefore, this project may affect and is likely to adversely affect (LAA) ABB or its habitat. Proposed actions may affect ABB; however, any take that may occur as a result of a Site Development project is excepted under the ABB 4(d) rule, and effects from wildlife management have been evaluated in the ABB 4(d) BO. Compensatory mitigation would not be required.

If the above OPTION 3 box is checked, then evaluation is complete, and the remainder of the form can remain blank. The AMMs (ABB-1 through ABB-7) listed in the previous section will be required for the project and should be copied and pasted into the OERCC form.

If none of the OPTION 1, OPTION 2, or OPTION 3 boxes are checked, then proceed to OPTION 4 and review for applicability.

OPTION 4:

<u>DETERMINATION OF EFFECT:</u> PROJECT MAY AFFECT AND IS LIKELY TO ADVERSELY AFFECT (LAA) ABB OR ITS HABITAT BUT INCIDENTAL TAKE IS NOT PROHIBITED UNDER ABB 4(d) RULE. AMMs ARE REQUIRED. HABITAT MAPPING IS NOT REQUIRED.

If the project is not located entirely in unfavorable habitat, then proceed to the next step, which requires habitat mapping (and do not check this box).

☐ LAA – project located entirely in unfavorable habitat.

Estimated Soil Disturbance to Unfavorable Habitat:

This would be checked for urban projects with no suitable habitat (but unfavorable habitat is present) and pavement preservation projects that will not disturb soil outside of the roadway prism (toe-of-foreslope to toe-of-foreslope). It is unlikely other projects are located entirely in unfavorable habitat but could be considered if the surrounding habitat within a mile or more of any portion of the project consists of only row crop agricultural or other unfavorable conditions. Quantification of disturbed soil (in unfavorable habitat) could be estimated by multiplying the length of the project by the greatest distance from the roadway surface to the toe-of-foreslope.

With the implementation of AMMs, potential adverse effects would be reduced, but incidental take is possible in unfavorable habitat; therefore, this project may affect and is likely to adversely affect (LAA) ABB or its habitat. Proposed actions may affect ABB; however, incidental take that occurs in unfavorable habitat as a result of the project is not prohibited under the ABB 4(d) rule. Compensatory mitigation would not be required.

If the above OPTION 4 box is checked, then evaluation is complete, and the remainder of the form can remain blank. The AMMs (ABB-1 through ABB-7) listed in the previous section will be required for the project and should be copied and pasted into the OERCC form.

If none of the OPTION 1, OPTION 2, OPTION 3, or OPTION 4 boxes are checked, then proceed to OPTION 5.

HABITAT MAPPING IS REQUIRED FOR PROJECTS NOT MEETING THE ABOVE OPTIONS.

OPTION 5:

<u>DETERMINATION OF EFFECT:</u> PROJECT MAY AFFECT AND IS LIKELY TO ADVERSELY AFFECT (LAA) ABB OR ITS HABITAT. INCIDENTAL TAKE IS PROHIBITED UNDER ABB 4(d) RULE. AMMs AND HABITAT MAPPING ARE REQUIRED.

COMPLETE THE FOLLOWING STEPS.

<u>Step 1</u>:

Complete habitat assessment mapping following guidance in the NDOT ABB PBA (**Appendix C**) and provide data in **Table 1**. Determine if any portion of the project is located in the high density area, as defined in the NDOT ABB PBA/PBO; shapefile of the high density area boundary should be provided by NDOT.

Table 1: Soil Disturbance Impacts on ABB Habitat Based on GIS Analysis

Description of Analysis	Results
Total Permanent impact to Suitable Habitat (acres)	
Total Temporary impact to Suitable Habitat (acres)	
Total Permanent impact to Unfavorable Habitat (acres)	
Total Temporary impact to Unfavorable Habitat (acres)	
Total Soil Disturbance (acres)	
Total Permanent and Temporary Soil Disturbance in Suitable Habitat (acres)	

<u>Step 2</u>:

Copy and paste the AMMs (from above section) into the OERCC form.

Incidental take would be reasonably certain to occur and unavoidable even with the implementation of AMMs; therefore, this project may affect and is likely to adversely affect (LAA) ABB and its habitat. Incidental take in suitable habitat is prohibited by the ABB 4(d) rule.

<u>Step 3:</u>

Use soil disturbance data in **Table 1** to complete calculations to determine potential compensatory mitigation credits in **Table 2**. Fill in take density estimate based on location relative to the high density area, as defined in the NDOT ABB PBA/PBO, and required for the ABB Project Evaluation Form.

Within Table 1, complete the following:

- *Row 1, Column 1: Fill in "OUTSIDE" or "WITHIN" relative to the high density area. If any portion of the project is within the high density area, then consider the whole project as "WITHIN".*
- *Column 2: Fill in blank cells with data from Table 1. If it is zero acres, then be sure to mark it as zero (i.e., do not leave the cell blank). Calculate the sum of acres of suitable habitat in row 6. Acres should be calculated to the nearest hundredths of an acre (i.e., two decimal places).*

- *Column 3: If outside the high density area, then apply the applicable ratio to determine credits; similarly, if within the high density area, then apply the applicable ratio to determine credits. For example, if a project has 3.26 acres of permanent impacts to suitable habitat and is within the high density area, then the credit required would be 3.26 times 1.5, which equals 4.89 credits.*
- *Row 7, Column 4: Calculate the sum of credits of compensatory mitigation from Rows 4 and 5 in Column 4. Credits should be calculated to the nearest hundredth of a credit (i.e., two decimal places).*

Table 2: Compensatory Mitigation Required

	Column 1	*Column 2*	*Column 3*	*Column 4*
Row 1	**PROJECT LOCATED _____ HIGH DENSITY AREA**	**SOIL DISTURBANCE (ACRES)**	**COMPENSATORY MITIGATION CREDIT RATIO (CONSERVED: AFFECTED)**	**MITIGATION CREDITS REQUIRED**
Row 2	Temporary Impacts to Unfavorable Habitat		n/a	
Row 3	Permanent Impacts to Unfavorable Habitat		n/a	
Row 4	Temporary Impacts to Suitable Habitat		0.25:1 (outside HDA[1]) OR 0.5:1 (within HDA)	
Row 5	Permanent Impacts to Suitable Habitat		1:1 (outside HDA) OR 1.5:1 (within HDA)	
Row 6	**Total Acres of Soil Disturbance to Suitable Habitat**		n/a	
Row 7	**Total Credits of Compensatory Mitigation**			

[1]HDA = high density area, as identified in **Appendix A of the NDOT ABB Programmatic Biological Assessment**.

Step 4: NDOT T&E Biologists will enter project information from **Table 1** and **Table 2** into the programmatic tracking spreadsheet. **Consultation is complete.**

Glossary (consistent with the ABB Programmatic BA)

Glossary pages can be deleted prior to submitting the evaluation form to NDOT.

ABB 4(d) rule - a rule regarding ABB that specifies what constitutes prohibited taking of ABB and provides exceptions from take prohibitions (see Excepted Take). The rule does not remove, or alter in any way, the consultation requirements under Section 7 of the ESA or NESCA. The Intra-Service Section 7 Biological Opinion on the final 4(d) rule (ABB 4(d) BO) provides a framework for streamlined consultation as an option for federal and non-federal agencies to use. The 4(d) rule prohibits all intentional take of ABB. Within the Northern Plains analysis areas, USFWS prohibits incidental take only if it occurs in suitable habitat and is the result of soil disturbance, which includes converting habitat from an existing land use to a different land use. Overall, the following prohibitions apply to ABB:

(i) Take of ABB, except that take that is incidental to otherwise lawful activity (incidental take), is prohibited only when the take occurs on suitable ABB habitat in the Northern Plains Analysis Areas where the incidental take results from soil disturbance.

(ii) Possession and other acts with unlawfully taken ABB.

> (A) It is unlawful to possess, sell, deliver, carry, transport, or ship, by any means whatsoever, any ABB that was taken in violation of paragraph (d)(1)(i) of this section or State law.
>
> (B) Notwithstanding paragraph (d)(1)(ii)(A) of this section, Federal and State law enforcement officers may possess, deliver, carry, transport, or ship any ABB taken in violation of the Act as necessary in performing their official duties.

(iii) Import and export of the ABB.

(iv) Interstate or foreign commerce. It is unlawful to deliver, receive, carry, transport, or ship, by any means whatsoever, in interstate or foreign commerce or in the course of a commercial activity, ABB.

(v) Sale or offer for sale. It is unlawful to sell or to offer for sale in interstate or foreign commerce any ABB.

This 4(d) rule (85 FR 200) was published for ABB on October 15, 2020 (effective November 16, 2020) (hereafter referred to as ABB 4(d) rule).

Action - As defined in ESA Section 7 regulations (50 CFR 402.02), “action” means “all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies in the United States or upon the high seas.”

Action area - all areas to be affected directly or indirectly by the action and not merely the immediate area involved in the action. For the purposes of this programmatic consultation, the Action Area includes the combined USFWS and NGPC ranges for ABB.

Affect/effect - to affect (a verb) is to bring about a change ("The proposed action is likely to adversely affect piping plovers nesting on the shoreline"). The effect (usually a noun) is the result ("The proposed highway is likely to have the following effects on the Florida scrub jay"). "Affect" appears throughout section 7 regulations and documents in the phrases "may affect" and "likely to adversely affect." "Effect" appears throughout section 7 regulations and documents in the phrases "adverse effects," "beneficial effects," "effects of the action," and "no effect."

AMMs - avoidance and minimization measures (AMMs) are implemented to reduce the potential impacts of the project on ABB or its habitat. These were determined by the NDOT ABB programmatic consultation with USFWS and NGPC (NDOT 2025).

Compensatory mitigation (as provided in the Endangered Species Act Compensatory Mitigation Policy [USFWS 2023]) - compensation or offsets for remaining unavoidable impacts after all appropriate and practicable avoidance and minimization measures have been applied, by replacing or providing substitute

resources or environments (see 40 CFR 1508.20) through the restoration, establishment, enhancement, or preservation of resources and their values, services, and functions.

Conservation pathway - options for mitigation within this programmatic consultation that contribute to the propagation and survival of ABB to ensure there is a net conservation benefit to ABB for projects requiring compensatory mitigation.

Excepted take - or "exceptions to take prohibitions" refers to activities that would be prohibited but were listed as an exception from prohibitions in the ABB 4(d) rule. Exceptions to prohibited take can also be found in Section 10 recovery permits or incidental take permits. The ABB 4(d) rule provides the following exceptions to prohibited take:

(i) Any employee or agent of the Service or of a State conservation agency that is operating a conservation program pursuant to the terms of a cooperative agreement with the Service in accordance with section 6(c) of the Act, who is designated by his or her agency for such purposes, may, when acting in the course of his or her official duties, take ABB, provided that, for State conservation agencies, the ABB is covered by an approved cooperative agreement to carry out conservation programs.

(ii) Federal or State government agencies may incidentally take ABB when conducting wildlife management activities in the Northern Plains Analysis Areas.

(iii) Incidental take of ABB resulting from ranching and grazing activities is allowed.

Harass - Harass is defined by USFWS as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering."

High density area - area in Nebraska with historical ABB densities greater than 0.04 ABB/acre (specific to this NDOT ABB Programmatic Consultation, Appendix A).

Non-prohibited take - also referred to as "take not prohibited" are activities or actions that are not explicitly prohibited or restricted by regulations or rules regarding the conservation or protection of a specific species. In the context of this programmatic BA, it refers to activities that do not violate the rules outlined in the 4(d) rule for ABB).

Permanent impacts - impacts that eliminate ABB habitat (e.g., buildings, roads, quarries, strip mines), as well as any impact to habitat that takes more than 5 years to re-establish as suitable for ABB use.

Prime habitat - suitable habitat that generally contains higher densities of ABB. Examples include undeveloped wet meadows with some trees, especially cottonwoods (*Populus deltoides*), or forest areas. Water sources, including the presence of a river, stream, or sub-irrigated soils (water is close to the surface as a result of shallow aquifer), are located within one mile. Low wetland meadows may be grazed by cattle or used for haying. Cropland is not visible within a one-mile area. Sources of light pollution, including yard lights or houses, are absent.

Prohibited take - see **ABB 4(d) rule** for take prohibitions.

Roadway - for the purposes of this programmatic consultation, the constructed roadway prism from the toe-of-foreslope to the toe-of-foreslope.

Soil disturbance - means movement or alteration of soil associated with modifying the existing land use. Soil disturbance includes actions such as grading, filling, soil excavating or topsoil stripping. Soil disturbance also includes non-physical alterations such as chemical treatment, including ground or soil sterilizers, and pesticides that would make the habitat unsuitable.

Suitable habitat - as defined by Provisions of the ABB 4(d) rule, are "areas where suitable soils contain the appropriate abiotic elements (e.g., soil temperature, soil moisture, particle size, etc.) that are

favorable for excavation and formation of brood chambers and where appropriate carrion for reproduction is available". Most areas outside the toe-of-foreslope are considered suitable habitat (unless they meet the unsuitable or unfavorable descriptions described above). These suitable areas could provide habitat for ABB, support critical portions of the ABB life cycle, or help support potential food resources.

Temporary impact (or Temporary soil disturbance) - activities or actions that alter or remove ABB habitat after which the disturbed area is restored to a condition suitable for ABB use within five years of the original activities. Temporary impacts would not convert suitable habitat to unfavorable habitat.

Unfavorable habitat - for ABB, includes areas with frequent disturbance or other characteristics making it unlikely ABB would find adequate food resources and refuge, or suitable breeding conditions. Unfavorable habitat for ABB includes the following areas, as worded in the ABB 4(d) Determination Key Definitions (accessible: https://www.fws.gov/media/american-burying-beetle-d-key-definitions), unless the area has already been classified as unsuitable habitat:

1. Land that is tilled on a regular basis, planted in monoculture, and does not contain native vegetation.
2. Pasture or grassland that has been maintained through frequent mowing, grazing, or herbicide application at a height of 20 cm (8 inches) or less.
3. Land that has already been developed and no longer exhibits topsoil, leaf litter, or vegetation.
4. Urban areas with maintained lawns, paved surfaces, or roadways.
5. Stockpiled soil without vegetation.
6. Wetlands or permanent waterbodies with standing water or saturated soils. Areas adjacent to wetlands and/or riparian areas are not considered unfavorable for the ABB, as they may be important for ABBs seeking moist soils during dry conditions.

NDOT has worked with USFWS and NGPC to further refine the definition of a roadway, as included in #4 above. The roadway as defined in this BA is the constructed roadway prism from the toe-of-foreslope to the toe-of-foreslope. Other areas within the project limits (outside of the toe-of-foreslope) may also be considered unfavorable habitat. This depends on proximity to adjacent unfavorable habitat, length of adjacent unfavorable habitat, and type of unfavorable habitat (e.g., areas around standing water wetlands are less likely to be called unfavorable). If it is a patchwork of suitable and unfavorable habitat or only one side of the road has unfavorable habitat, then the area should not be considered unfavorable.

Unsuitable habitat - for ABB, generally includes "land cover types that do not provide habitat that would be favorable for any portion of the ABB life cycle (such as open water or highly developed urban lands)" (ABB Species Status Assessment, 2019 and Intra-Service Section 7 biological opinion on reclassifying the American burying beetle (*Nicrophorus americanus*) from endangered to threatened on the federal list of endangered and threatened wildlife with a 4(d) Rule, Final Rule, 2020). Various sections of the Species Status Assessment provide information about unsuitable habitat. This information is paraphrased as the following: areas permanently inundated with water (i.e., stream or river channels and ponds), paved areas such as asphalt or concrete roadway and driveways, and frequently compacted soil or gravel surfaces such as field access drives and gravel roadways. Urban areas consisting of all paved or hard surfaces and areas lacking vegetation would also be considered unsuitable habitat.