Appendix D3.1: Ecological Systems Natural Resources Reports and Correspondence

2024 Natural Resources Report Update

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Natural Resources Report

Chicago to St. Louis High Speed Rail
Elwood to Braidwood (Tier 8)
2024 Natural Resources Update
MP 45.5 to 55.5
Will County, Illinois

Date: November 2020
Updated: October 2024
File No. 81.0220288.18

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1.0 INTRODUCTION 1

2.0 UPDATED NATURAL RESOURCES SURVEYS 1

2.1 BOTANICAL SURVEYS 4

2.1.1 Botanical Survey Methodologies 4

2.1.2 Botanical Species Habitat, Natural History, and Characteristics 5

2.1.2.1 Eastern Prairie Fringed Orchid 5

2.1.2.2 Leafy Prairie Clover 6

2.1.2.3 Mead's Milkweed 6

2.1.2.4 Grass Pink Orchid 7

2.1.2.5 Oklahoma Grass Pink Orchid 7

2.1.2.6 Queen-of-the-Prairie 8

2.1.2.7 Decurrent False Aster 8

2.1.2.8 Royal Catchfly 8

2.1.2.9 Buffalo Clover 9

2.1.2.10 Qaurterman's Hedge Hyssop 9

2.1.2.11 Butler's Quillwort 9

2.1.2.12 Large Cranberry (Buffer outside limits) 10

2.1.2.13 Tubercled Orchid 10

2.1.2.14 Northern Panic Grass 10

2.1.2.15 Rattlesnake-Master 10

2.1.2.16 Prairie Dropseed 11

2.1.2.17 Bulrush 11

2.1.2.18 Eastern Straw Sedge 11

2.1.2.19 Regional Forester's Sensitive Species 12

2.1.3 Botanical Survey Results 13

2.2 RATTLESNAKE MASTER BORER MOTH METHODOLOGIES 21

2.2.1 Rattlesnake Master Borer Moth Survey Results 21
2.3 AVIAN SURVEYS 22
2.3.1 Avian Survey Timeframe and Duration 22
2.3.2 Avian Survey Boundaries 22
2.3.3 Bird Species Habitat, Natural History, and Characteristics 22
2.3.3.1 Loggerhead Shrike 22
2.3.4 Avian Survey Results 23
2.4 HERPETOFAUNA SURVEY 24
2.4.1 Introduction 24
2.4.2 Materials and Methods 24
2.4.2.1 Eastern Massasauga Species Biology 24
2.4.2.2 Ornate Box Turtle Species Biology 25
2.4.2.3 Blanding's Turtle Species Biology 26
2.4.3 Survey Areas 27
2.4.4 Survey Protocols 28
2.4.5 Results 29
2.4.6 Discussion 31
2.5 RUSTY PATCHED BUMBLE BEE SURVEY 31
2.5.1 Life History 31
2.5.2 Habitat 31
2.5.3 Survey Methodology 32
2.5.4 Survey Results 34
3.0 BRIDGE BAT ASSESSMENTS 35
4.0 REGIONAL FORESTER SPECIES 35
5.0 SUMMARY 35
6.0 REFERENCES 37

TABLES

TABLE 2-1: SPECIES SURVEY SUMMARY 1

TABLE 2-2:REGIONAL FORESTER'S SENSITIVE SPECIES 3

TABLE 2-3: FIELD SURVEY DATES AND TARGET FLORA SPECIES ..... **ERROR! BOOKMARK NOT DEFINED.**

TABLE 2-4: REGIONALLY NOTEWORTHY BOTANICAL RESOURCE AREAS SUMMARY TABLE 20

TABLE 2-5: RATTLESNAKE MASTER POPULATIONS 21

TABLE 2-6: AVIAN FIELD SURVEY DATES AND SURVEY HOURS 26

TABLE 2-7: SPECIMENS COLLECTED DURING BLANDING'S TURTLE TRAPPING SURVEYS 30

TABLE 2-8: SPECIMENS OBSERVED DURING VISUAL ENCOUNTER SURVEYS FOR HERPETOFAUNA 30

TABLE 2-9: VISUAL ENCOUNTER SURVEY PERSON-HOURS FOR HERPETOFAUNA 31

TABLE 2-10: RUSTY PATCHED BUMBLE BEE SURVEY EFFORT 33

TABLE 2-10: RUSTY PATCHED BUMBLE BEE SURVEY RESULTS 34

APPENDICES

APPENDIX A — Site Location Map
USFWS IPAC
IDNR EcoCAT
APPENDIX B — Botanical Site Location Map
Botanical Survey Photographic Log
Floristic Quality Assessments
INHS Botanic Surveys
APPENDIX C — Rattlesnake Master Location Map
Rattlesnake Master Photographic Log
APPENDIX D — Avian Survey Location Map
Avian Survey Photographic Log
APPENDIX E — Turtle Survey Location Map
Turtle Survey Photographic Log
APPENDIX F — Rusty Patched Bumble Bee Habitat Assessment
Project Limits within the HPZ Map
Illinois Protected Lands Map
RPBB Habitat Map
Rusty Patched Bumble Bee Survey Map
Rusty Patched Bumble Bee Photographic Log
Rusty Patched Bumble Bee Identification Summary
APPENDIX G — Regional Forester's Sensitive Species
APPENDIX H — Bridge Bat Assessments

1.0 INTRODUCTION

As a part of the corridor studies for the Union Pacific Railroad (UPRR) High Speed Intercity Passenger Rail Tier 8 Double Tracking Project, Huff & Huff, Inc. (H&H) updated natural resources surveys for the project limits. Previous field surveys were completed for the proposed project by Illinois Natural History Survey (INHS) and H&H between 2013 and 2015. Botanical surveys were conducted on the following dates: June 26, 28, 29, July 23, 28, 30, August 5, 7, 11, 12, 13, 18, and September 1 and 3, 2020 and May 28, 29, June 3, 4, and 11, August 6, 8, and 13, 2024.

H&H updated species surveys within and adjacent to the proposed rail improvements between Elwood and Braidwood as well as on portions of Midewin National Tallgrass Prairie (Midewin), governed by the U.S. Forest Service, and Hitt's Siding Prairie Nature Preserve, owned by the Illinois Department of Natural Resources (IDNR), properties within and adjacent to the project limits as shown on Figure 1 (Appendix A). The results for the surveys conducted are presented in this report.

Both the U.S. Fish & Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) and IDNR Ecological Compliance Assessment Tool (EcoCAT) were updated in 2024 and are located in Appendix A.

2.0 UPDATED NATURAL RESOURCES SURVEYS

In 2020, H&H was tasked to update previous surveys completed by INHS and H&H between 2013 and 2015. The 2013, 2014, and 2015 field investigations included botanical, avian, herpetofauna, and bat/tree surveys. Species surveys were updated in 2020 by H&H staff based on an updated Illinois Natural Heritage Database list received from Illinois Department of Transportation (IDOT) on September 2, 2020. The Natural Heritage Database includes state (IESPB, 2020) and federally (USFWS) listed species. Additional surveys were conducted by H&H in 2024 to include Regional Forester's Sensitive Species (RFSS) and additional state-listed species that were not previously surveyed for the proposed project. In addition, Bridge Bat Assessments were completed for the proposed project in 2024 by H&H. Table 2-1 summarizes the species and survey dates.

Table 2-1: Species Survey Summary

Species	Previous Surveys Completed	2024 Update (Y/N)
Birds		
Loggerhead shrike (*Lanius ludovicianus*)	2011 & 2012, 2020 – H&H	N
Upland sandpiper (*Bartramia longicauda*)	2011 & 2012, 2020 – H&H	N
Herpetofauna		
Blanding's turtle (*Emydoidea blandingii*)	2014, 2020 – H&H	N
Ornate box turtle (*Terrapene ornata*)	2014, 2020 – H&H	N
Eastern massasauga rattlesnake (*Sistrurus catenatus*)	2014, 2020 – H&H	N
Insects		
Rusty patched bumble bee	2020	N

Species	Previous Surveys Completed	2024 Update (Y/N)
(*Bombus affinis*)		
Mammals		
Northern long-eared bat (*Myotis septentrionalis)*	2015 – H&H (Habitat)	Bridge Bat Assessment completed
Flora		
Eastern prairie fringed *orchid* (*Platanthera leucophaea*)	2013 & 2014 – INHS	N
Lakeside daisy (*Hymenoxys herbacea*)	2014-INHS	N
Leafy prairie clover (*Dalea foliosa*)	2014 – INHS; 2013, 2020 -H&H	Y
Mead's milkweed (*Asclepias meadii*)	2014 – INHS; 2020 – H&H	N
Decurrent false aster (*Boltonia decurrens*)	2014 – INHS; 2020 – H&H	Y
Ear leaved false-foxglove (*Agalinis auriculata*)	2014 – INHS; 2013, 2020 -H&H	Y
Grass pink orchid (*Calopogon tuberosus*)	2014 – INHS; 2013, 2020 – H&H	Y
Large cranberry (*Vaccinium macrocarpon*)	2014 – INHS; 2020 – H&H	N
Oklahoma grass pink orchid (*Calopogon oklahomensis*)	2014 – INHS; 2013, 2020 - H&H	Y
Queen of the prairie (*Filipendula rubra*)	2014 – INHS; 2020 – H&H	Y
Prairie dropseed *(Sporobolus heterolepis*)	2014-INHS; 2020 -H&H	Y
Rattlesnake Master (*Eryngium yuccifolium*)	2014 – INHS;2015, 2020 - H&H	Y
Tubercled orchid (*Platanthera flava var. herbiola*)	2014 – INHS; 2020 – H&H	Y
Flora – Added in 2020		
Buffalo clover (*Trifolium reflexum*)	2020 – H&H	Y
Butler's quillwort (*Isoetes butleri*)	NA	NA
Quarterman's hedge hyssop (*Gratiola quartermaniae*)	2020 – H&H	Y
Northern panic grass (*Dichanthelium boreale*)	2020 – H&H	Y
Royal catchfly (*Silene regia*)	2020 – H&H	Y
Flora – Added in 2024		

Species	Previous Surveys Completed	2024 Update (Y/N)
Bulrush (*Sciprus hattorianus*)	NA	Y
Eastern straw sedge (*Carex straminea*)	NA	Y

In 2024, botanic surveys were conducted to include plants on the U.S. Forest Service RFSS list. Table 2-2 lists the RFSS species known at Midewin as well as whether each was surveyed for by H&H in 2024.

Table 2-2 Regional Forester's Sensitive Species 2024

Scientific Name	Common name	Surveyed
Flora		
Agalinis auriculata	Earleaf false foxglove	Yes
Bagliettoa marmorea	Wart lichen	Yes
Circium hillii	Hill's thistle	Yes
Cypripedium candidum	Small white lady's slipper	Yes
Festuca paradoxa	Cluster fescue	Yes
Gratiola quartermaniae	Quarterman's hedge-hyssop[2]	Yes
Hydrastis canadensis	Goldenseal	Yes
Isoetes butleri	Butler's quillwort	Yes
Malvastrum hispidum	Hispid false mallow	Yes
Minuartia patula	Pitcher's stitchwort	Yes
Panax quinquefolius	American ginseng	Yes
Sanguisorba canadensis	Canada burnet	Yes
Silene regia	Royal catchfly	Yes
Valeriana edulis var ciliata	Hairy valerian	Yes
Valerianella umbilicata	Naval corn salad	Yes
Animals		
Asio flammeus	Short eared owl[2]	No
Bartramia longicauda	Upland sandpiper[2]	Yes
Botaurus lentiginosus	American bittern	No
Circus cyaneus	Northern harrier[2]	No
Coccyzus erythropthalmus	Black billed cuckoo[1]	No
Dolichonyx oryzivorus	Bobolink[1]	No
Emydoidea blandingii	Blanding's turtle[2]	Yes
Eptesicus fuscus	Big brown bat	No
Haliaeetus leucocephalus	Bald eagle[1]	Yes
Ixobrychus exilis	Least bittern	No
Lanius ludovicianus migrans	Migrant loggerhead shrike[12]	Yes
Melanerpes erythrocephalus	Red headed woodpecker[1]	No
Rallus elegans	King rail[1]	No
Rana blairi	Plains leopard frog	No

Setophaga cerulea	Cerulean warbler[1]	No
Spermophilus franklinii	Franklin's ground squirrel	No
Invertebrates		
Scientific Name	**Common name**	**Surveyed**
Aflexia rubranura	Red tailed leafhopper	No
Danaus plexippus	Monarch butterfly	No
Dannella lita	A mayfly	No
Deltocephalus gnarum	A leafhopper	No
Dichagyris reliqua	A noctuid moth	No
Macrosteles potorius	A leafhopper	No
Oncocnemis saundersiana	A noctuid moth	No
Papaipema beeriana	Blazing star stem borer moth	No
Papaipema eryngii	Rattlesnake master borer moth[2]	No
Plusia venusta	White streaked looper moth	No
Sphinx luscitiosa	Clemen's sphinx	No
Vernustaconcha ellipsiformis	Ellipse	No

[1]Species on the 2024 IPaC.
[2]Species on the 2024 EcoCAT.

2.1 BOTANICAL SURVEYS

2.1.1 Botanical Survey Methodologies

Botanical surveys were conducted on June 26, 28, 29, July 23, 28, 29, 30, August 5, 7, 11, 12, 13, 18, 21 and September 1 and 3, 2020; and May 28, 29, June 3, 4, and 11, August 6, 8, and 13, 2024 within and immediately adjacent to the project limits (Appendix A, Figure 1) to provide an supplemental data to the previous vascular plant species surveys completed for the proposed project by the Illinois Natural History Survey (INHS) in 2013 and 2014 and by H&H in 2014 and 2020, with primary objectives including:

1) The 2024 survey reevaluated the quality of high-quality botanical sites previously identified during the 2013 and 2014, flora surveys, which includes three categories (Significant, Exceptional, or Regionally Noteworthy Botanical Resource Areas (defined below)
    a. *Significant Botanical Resource Area* – area with a high level of natural quality, which would appear to qualify for the Illinois Natural Areas Inventory (INAI) as a Category 1 natural area.
    b. *Exceptional Botanical Resource Area* – area that based on floristic quality would likely qualify for the INAI as a Category 1 natural area but does not meet other INAI criteria for a particular community type (e.g., size requirement).
    c. *Regionally Noteworthy Botanical Resource Area* – relatively high-quality natural community that likely does not meet INAI criteria for a Category 1 natural area,but is clearly an outstanding example of a specific community type, or assemblage of community types, for a particular region of Illinois, or within a defined project area.
2) The 2024 survey reevaluated previously identified high quality botanical sites to update the flora species compositions and determine the potential presence of listed flora species.
3) The 2024 survey added survey dates within the bloom times of the Regional Forester Species (RFSS).

Flora species lists were compiled for areas encountered during the 2020 and 2024 meander surveys that represent high quality and/or potential high quality flora communities. Random meander surveys were conducted by surveying representative habitats within and immediately adjacent to the project limits, specifically searching for high quality plant species assemblages, high quality species, species of concern, and listed plant species previously identified through previous field surveys and desktop analysis, with an understanding of specific species growth forms and habit/habitats.

Biologists utilized previous survey data and aerial photography as a search guide. Surveys focused on high quality, remnant prairie areas, which include xeric, mesic, wet prairies, sedge meadows, as well as sand prairies. Special attention was given to high-quality remnant areas or restoration areas within the UPRR right-of-way (ROW) adjacent to Midewin and Hitts Siding Prairie Nature Preserve as these areas contain the highest potential habitat for the listed flora survey species.

Floristic Quality Assessments

Floristic quality assessments (FQA)s were conducted for botanic sites possessing noteworthy or remnant quality to further evaluate and substantiate empirical determinations of community quality, based on INAI grades. Observed plant species were noted to obtain the native Floristic Quality Index (nFQI) and native mean C-value (coefficient of conservatism). Areas of high natural quality include native plants with C-values ranging from approximately four to ten. C-values are assigned to native plants as listed in *Flora of the Chicago Region* (Wilhelm and Rericha, 2017). A low C-value indicates that a plant is generally not considered high quality or is a habitat generalist. An nFQI for each site is obtained by multiplying the mean C-value of all native plants encountered by the square root of the number (N) of native species.

Natural Community Classification

Natural communities (botanical sites) are classified and their quality is evaluated using the criteria developed for the INAI (IDNR, 2023). Natural communities are graded based on the degree of anthropogenic disturbance; grades of natural quality are as follows;

- Grade A: Relatively stable or undisturbed communities;
- Grade B: Late successional or lightly disturbed communities;
- Grade C: Mid-successional or moderately to heavily disturbed communities;
- Grade D: Early successional or severely disturbed communities; and
- Grade E: Very early successional or very severely disturbed communities.

2.1.2 Botanical Species Habitat, Natural History, and Characteristics

Botanical surveys were completed for the following plants in 2020 and/or 2024.

2.1.2.1 Eastern Prairie Fringed Orchid

The eastern prairie fringed orchid (*Platanthera leucophaea*) occurs in scattered counties of central and northern Illinois. Only small, local populations of this rare plant exist in high quality habitats (Hilty, 2018). The eastern prairie fringed orchid occurs in a wide variety of habitats, from mesic prairie to wetlands such as sedge meadows, marsh edges, even bogs. It requires full sun for optimum growth and flowering and a grassy habitat with little or no woody encroachment (USFWS, 2024a).

The eastern prairie fringed orchid is eight to forty inches tall and has an upright leafy stem with a flower cluster called an inflorescence. The three to eight-inch lance-shaped leaves sheath the stem. Each plant has one single flower spike composed of five to forty creamy white flowers. Each flower has a three-part fringed lip less than one inch long and a nectar spur (tube-like structure) which is about one to two inches long (USFWS, 2024a).

This orchid is a perennial herb that grows from an underground tuber. Flowering begins from late June to early July and lasts for seven to ten days. Blossoms often rise just above the height of the surrounding grasses and sedges. The more exposed flower clusters are more likely to be visited by the hawkmoth pollinators, though they are also at greater risk of predation by deer. Seed capsules mature over the growing season and are dispersed by the wind from late August through September (USFWS, 2024a).

Eastern prairie fringed orchid is federally listed as threatened, but listed as endangered in Illinois (IDNR, 2020).

2.1.2.2 Leafy Prairie Clover

Leafy prairie clover (*Dalea foliosa*) has been observed in only a few counties in northern Illinois. Today, it is restricted to two to seven populations in northeastern Illinois, including Midewin (USFS, 2024a). Leafy prairie clover also occurs in Tennessee and Alabama. Populations have declined in all three states. In Illinois, habitats are restricted to mesic dolomite prairies and rocky riverbanks. Lack of management has resulted in habitat loss to woody encroachment and non-native, invasive plants (USFS, 2024a).

This native perennial wildflower is about one to two feet tall, branching occasionally to frequently. It is ascending to erect, although some of the side branches may sprawl across the ground in open areas. The central stem and side branches are light green, hairless, and terete or angular in cross-section (Hilty, 2018).

The alternate compound leaves are odd-pinnate with five to 15 pairs of leaflets and a terminal leaflet. The compound leaves are up to three inches long and they have short petioles. Individual leaflets are medium green, oblong, hairless, and smooth along their margins. Each leaflet has a very short petiole and a tiny, pointed tip (Hilty, 2018).

The petals of these flowers are medium purple or rose-pink (rarely white), while their sepals and bracts are green-white. The petals are oblanceolate or obovate and longer than the sepals. The short sepals are lanceolate with green tips and white bases. The blooming period occurs from mid- to late summer and lasts about one to two months. There is no noticeable floral scent. Each flower is replaced by a short seedpod with a slender beak that is largely enclosed by the persistent sepals; each seedpod contains one to two smooth seeds. As the seeds mature, the floral spikes become dark brown. The root system consists of a short stout taproot with fibrous rootlets. This wildflower reproduces by reseeding itself. Individual plants typically live less than eight years (Hilty, 2018).

Leafy prairie clover is federally endangered, and state listed as endangered in Illinois (IDNR, 2020).

2.1.2.3 Mead's Milkweed

Mead's milkweed (*Asclepias meadii*) is a perennial plant, with suitable habitat comprised of well-drained, high quality tallgrass prairies. Mead's milkweed has declined due to habitat loss and degradation. There are no

naturally occurring populations of Mead's milkweed in Will County (INHS, 2014). Will County is within the historic range of this plant. Mead's milkweed has been planted at Midewin (INHS, 2014).

Mead's milkweed is a long-lived tallgrass prairie plant. It has a single slender unbranched stalk, 8 to 16 inches high, without hairs but with a waxy covering. Leaves are opposite, broadly ovate, 2 to three inches long. It has a solitary umbel at the top of the stalk with 5 to 15 greenish, cream-colored flowers (USFWS, 2024b).

Mead's milkweed is most obvious when in flower (late May-early June in northeastern Illinois). It is federally listed as threatened, but listed as endangered in Illinois (IDNR, 2020).

2.1.2.4 Grass Pink Orchid

The grass pink orchid (*Calopogon tuberosis*) is one of four terrestrial species of orchid belonging to the Orchidaceae family. The species is native throughout the Northeast, Southeast, and Midwest of the United States. It is considered relatively common in Northern Canada and within other states in its range; however, due to overcollection and habitat destruction, its population is considered imperiled in the state of Illinois (NatureServe Explorer, 2024).

In northern Illinois, the grass pink orchid is most commonly found in peaty meadows, swamps, and acid-soiled boggy areas, but can also be seen in fens. It is often found springing from peat or sphagnum moss (Wilhelm and Rericha, 2017).

The inflorescence of the species has a terminal raceme of four to 12 bright magenta to pink flowers that range from 10-40 cm above the ground. Its most distinctive feature is the flower's top petal which has a yellow bearded lip. Its leaves are basal and grass-like ranging from 10-30 cm long. The leaves are glabrous and create a pleated appearance with its expressed veins. This orchid is very difficult to identify outside of the blooming period between early June and early August as its basal leaves so closely resemble common grasses (Hilty, 2018).

Grass pink orchid is state-listed as endangered in Illinois within Will County (IDNR, 2020).

2.1.2.5 Oklahoma Grass Pink Orchid

The Oklahoma grass pink orchid (*Calopogon oklahomensis*), also known as the prairie grass pink, is a terrestrial species of orchid native to the south-central U.S and is considered extirpated throughout most of its range (NatureServe Explorer, 2024).

The Oklahoma grass pink orchid occupies mesic, acidic, sandy to loamy soils found in tallgrass prairies, prairie remnants, pine savannas, and sandy woodlands, oak woodlands, edges of bogs, and frequently mowed meadows. This species appears to benefit from relatively frequent but mild disturbance (NatureServe Explorer, 2024).

It has flowers that are white, pink, or purple, with a lip that has yellow hairs. One distinguishing feature of the Oklahoma grass pink orchid is that, unlike most orchids, it is non-resupinate. The lip of the Oklahoma grass pink orchid is on the top of the flower, not the bottom, as is common with most other genera. The brushy, yellow protuberances on the lip are also designed to attract pollinators. The flower then snaps closed when a

potential pollinator lands on it, and the insect has to crawl out of the tight quarters between the lip and the reproductive parts below in order to escape, hopefully pollinating the flower in the process (IDNR, 2022).

According to the Natural Heritage Database, Oklahoma grass pink orchid is known to occur in the northern portion of Hitts Siding Prairie (Illinois Natural Heritage Database, 2020). Oklahoma grass pink orchid is state-listed as endangered in Illinois within Will County (IDNR, 2020).

2.1.2.6 Queen-of-the-Prairie

The queen-of-the-prairie (*Filipendula rubra*) is a perennial, flowering plant occurring in the eastern United States, from Minnesota to Missouri and to the eastern seaboard. In Illinois, it occurs in counties along the upper basin of the Illinois River and in the Chicago area. This species is found most often in wetter habitats, including fens, seeps, and mesic prairies with sandy soils. Its natural presence is indicative of high quality habitats (Hilty, 2018).

Queen-of-the-prairie can grow up to six feet high, with alternate compound leaves. Inflorescence occurs in panicles of small, pink flowers approximately 1/3rd of an inch across. This species blooms between June 13 and July 17 in northern Illinois for approximately three weeks (Hilty, 2018).

This species is state listed as threatened in Illinois within Will County (IDNR, 2020) and is listed as a RFSS species in 2024 (USFS, 2024b).

2.1.2.7 Decurrent False Aster

The decurrent false aster (*Boltonia decurrens*) is a terrestrial, perennial herbaceous plant that flowers from August to October. This species is native to Illinois, Iowa, and Missouri, particularly in areas associated with the Illinois River and Mississippi River basins. Its natural habitat is now largely restricted to several counties in central and southwestern Illinois. The decurrent false aster is generally found in moist, sandy prairies subject to periodic flooding (Cox and Slaton, 2024).

The decurrent false aster is typically found with multiple stems, growing up to approximately two-and-a-half meters, with white flowers blooming between August and October (Hilty, 2018).

A population of decurrent false aster occurs in Midewin, having been unintentionally planted during restoration of the site in the early 2000's (INHS, 2014).

This species is listed as federally threatened wherever encountered and state threatened in Illinois (IDNR, 2020). It should be noted that Will County is outside of the decurrent false aster's historical habitat and not listed on the Federal Threatened and Endangered species list in Will County.

2.1.2.8 Royal Catchfly

The royal catchfly (*Silene regia*) is an unbranched, flowering herb that grows up to one meter high. The stems are pubescent. This plant has a leafy appearance with striking red, five-petaled, star-shaped flowers occurring in clusters toward the top of the plant. The flowers bloom for a period of approximately one month toward the end of summer in northern Illinois, from July 17 to August 4 (Hilty, 2018).

This species occurs from the southern Great Lakes region to northern Florida, and as far west as Oklahoma and Kansas. Populations are patchily distributed throughout its broad range and within northern Illinois. It occurs in prairies, savannas, and other mesic, open habitats on well drained, often rocky soils (USFS, 2024c).

This species is listed as endangered in Illinois within in Will County (IDNR, 2020) and is listed as an RFSS Species in 2024 (USFS, 2024b).

2.1.2.9 Buffalo Clover

Buffalo clover (*Trifolium reflexum*) is a low-growing, flowering plant with alternate compound leaves. The flowers are red and white, occurring at the end of a central stem. Leaflets come in groups of three, typical of members of genus *Trifolium*, and are serrated.

This species ranges from the Great Plains to the Mid-Atlantic region, from the Gulf Coast as far north as the southern Great Lakes states. Populations in Illinois are scattered throughout the state, but typically occur in dry-to-mesic prairies and savannas (NatureServe Explorer, 2024).

This species is state listed as threatened in Illinois within Will County (IDNR, 2020) and is listed as an RFSS Species in 2024 (USFS, 2024b).

2.1.2.10 Quarterman's Hedge Hyssop

Quarterman's hedge hyssop (*Gratiola quartermaniae*) is a small flowering plant found with opposite, clasping leaves. Flowers occur at the ends of stalks and have a flute-like appearance and are whitish in color. This species typically blooms between June and September.

Populations of this species are scattered, occurring only in Texas, Alabama, Tennessee, Kentucky, Illinois, and Ontario. This species is usually found in limestone or dolomite areas with concentrated water and clayey soils, and is rarely found in other habitats (NatureServe Explorer, 2024). This habitat is not present within the project corridor (INHS, 2014).

This species is state listed as endangered in Illinois within Will County (IDNR, 2020) and is listed as an RFSS Species in 2024 (USFS, 2024b).

2.1.2.11 Butler's Quillwort

Butler's quillwort (*Isoetes butleri*) is an inconspicuous grass-like plant ranging up to approximately ten inches long. This species does not flower, and instead reproduces with spores (USFS, 2003).

This species is native to the southeast and southern Midwest, including Alabama, Arkansas, Georgia, Illinois, Kansas, Kentucky, Missouri, Oklahoma, Tennessee, and Texas. Populations in Illinois are quite separate from the other nearest populations. This species is found in seasonally moist calcareous habitats, usually only around shallow depressions in remnant dolomite prairies (USFS, 2003).

This species is state listed as endangered in Illinois within Will County (IDNR, 2020) and is listed as a RFSS Species in 2024 (USFS, 2024b). Butler's quillwort can be surveyed April, May and June. The habitat of calcareous soils over shallow limestone is not present adjacent to the railroad tracks within the project limits (INHS, 2014).

2.1.2.12 Large Cranberry

The large cranberry (*Vaccinium macrocarpon*) is a shrub that grows low to the ground in acidic soils, usually in bogs, fens, and swamps. This species has simple, alternate leaves that are evergreen. Nodding flowers grow in bunches of up to six on stalks. This species blooms May to June (Chayka and Dzuik, 2018).

This species ranges in the northeastern United States, from Illinois and Minnesota to New England and eastern Canada, and as far south as Tennessee and North Carolina. This species also occurs along the west coast of the United States and Canada (NatureServe Explorer, 2024).

This species is listed as endangered in Illinois within Will County (IDNR, 2020). Large cranberry was not observed within the project limits and is known to occur in the northern portion of Hitts Siding Prairie, outside of the project limits (INHS, 2014).

2.1.2.13 Tubercled Orchid

The tubercled orchid (*Platanthera flava*) is an herbaceous, perennial, flowering plant. This species has alternate leaves that are approximately four times longer than they are wide. The white to pale green flowers occur in spikes typical of orchids. This species blooms for a short duration in early-to-mid-summer (Hilty, 2018).

The tubercled orchid is widespread throughout the eastern United States, ranging from Missouri, Iowa, and Minnesota east to the Atlantic Ocean. This species occurs as far south as Georgia and ranges as far north at southern Canada (NatureServe Explorer, 2024). Most populations in Illinois are confined to high quality wet habitats in the northeastern portion of the state, including wet prairies, seeps, and floodplain forests (Hilty, 2018).

This species is listed as threatened in Illinois within Will County (IDNR, 2020). Tubercled orchid is known to occur in the northern portion of Hitts Siding Prairie (INHS, 2014).

2.1.2.14 Northern Panic Grass

Northern panic grass (*Dichanthelium boreale*) is a grass with three to five alternate lanceolate leaves. The flowers occur in clusters approximately five to ten centimeters long, and are green to purple in color, and elliptical in shape. This species is typically found in moist habitats and in sandy or rocky soil, most often in wet prairies and marshes (Chayka and Dzuik, 2018).

This species is widespread, though not common, throughout the eastern United States and Canada, ranging as far south as Georgia and as far west as Minnesota, Iowa, and Missouri (NatureServe Explorer, 2024).

This species is state listed as endangered in Illinois within Will County (IDNR, 2020) and is known to occur in the northern portion of Hitts Siding Prairie (INHS, 2014).

2.1.2.15 Rattlesnake-Master

Rattlesnake-master (*Eryngium yuccifolium*) is an herbaceous plant, growing up to approximately one and a half meters tall. This species has a rigid stem and hearty leaves, usually blue green in color. Inflorescences appear spiky and ball-like, whitish in color, and occur in clusters (Hilty, 2018).

This species occurs from the Gulf Coast up to the Great Lakes regions, and from Texas, Oklahoma, Kansas, and Nebraska to the east coast, excluding the Appalachian region (NatureServe Explorer, 2024). Populations in Illinois typically occur in moist to slightly dry open prairie habitats (Hilty, 2018).

This is species is not of conservation concern itself, except that the state-threatened rattlesnake master borer moth depends on the rattlesnake master plant for its larval development and only occurs on sites that support large, mature stands of the host plant (Hilty, 2018).

The rattlesnake master borer moth was previously listed as a federal candidate species. The USFWS determined that the moth does not warrant listing in July 2020 and has been removed as a candidate (USFWS 2024c).

2.1.2.16 Prairie Dropseed

Prairie dropseed populations were identified during the botanic survey. Prairie dropseed (*Sporobolus heterolepis*) is a tussock-forming perennial grass which grows to about one to two feet tall (Hilty, 2018).

This species occurs from the Gulf Coast up to the Great Lakes regions, and from Texas, Oklahoma, Kansas, and Nebraska to the east coast, excluding the Appalachian region (NatureServe, 2024). Prairie dropseed grows in mesic to dry conditions and populations in northern Illinois typically occur in high quality open prairie habitats (Hilty, 2018).

The state-threatened red-tailed leafhopper (*Aflexia rubranura*) is a specialist insect which is dependent on prairie dropseed, and lives on relatively large (greater than 20 tussocks) populations of the plant. All stages of the life cycle live on the above-ground parts of prairie dropseed. Females insert their eggs into the stems of prairie dropseed in late summer, where they remain dormant until spring and hatch in May. The nymphs feed on the sap of prairie dropseed and undergo five molts before reaching the adult stage in mid-summer (MNDNR, 2024).

2.1.2.17 Bulrush

Bulrush (*Scirpus hattorianus*) blooms early to late summer and has stiff, open branching clusters at the top of the stem, the main branches up to 5 inches long radiating from a central point with shorter divergent branchlets at each branch top. At the tip of each branchlet is head of 4 to 55 stalkless spikelets (2-3.5 mm long) (Chayka and Dzuik, 2018).

Bulrush is widespread throughout the eastern United States, ranging from Minnesota and Illinois east to the Atlantic Ocean. This species occurs as far south as North Carolina and ranges as far north as southern Canada (NatureServe Explorer, 2024). Bulrush inhabits shores, ditches, marshes, depressions in forest openings and meadow, and prefers part shade, moist to wet often disturbed soil (Chayka and Dzuik, 2018).

This species is state listed in Illinois as endangered within Will County (IDNR, 2020).

2.1.2.18 Eastern Straw Sedge

Eastern straw sedge (*Carex straminea*) blooms from the end of May through the first week of July. The leaves are 2-4mm. Spikelets have a distinctive staminate base with flattened, winged perigynia. Scales have sharp awn-like tips (MNFI, 2025).

Eastern straw sedge occurs in widely separated populations throughout the eastern United States, from Massachusetts west to Wisconsin and south to North Carolina, Kentucky, and Missouri. It grows densely clumped along emergent wetlands, marshes and swamp borders in sandy, acidic soils (NatureServe Explorer, 2024).

This species is state listed in Illinois as endangered within Will County (IDNR, 2020).

2.1.2.19 Regional Forester's Sensitive Species

Royal catchfly, Quarterman's hedge hyssop, Eastern straw sedge, and Butler's quillwort are RFSS species previously included in surveys and listed above. The additional RFSS Species (USFS, 2024b) surveyed in 2024 are summarized below:

- **Earleaf false foxglove** prefers habitats with ample sunlight, well-drained soils, and moderate moisture levels, open woodlands, prairies, along the edges of wetlands or marshes, and along railroads (Hilty, 2020).
- **Hill's thistle** is primarily found in prairies and savannas. It prefers full sun and well-drained soils, including thin soil over limestone bedrock (Ontario, 2021).
- **White lady's slipper** typically occurs in moist, sunny meadows, prairies, fens, limestone barrens, and forest edges. This plant prefers calcium-rich soils, often found in limestone-rich areas. These soils are typically well-drained and slightly alkaline. Often found in areas with a moderate amount of moisture, such as near streams, seeps, or in low-lying areas where water accumulates (University of Illinois, 2025).
- **Cluster fescue** is primarily found in wet meadows, prairies, open grasslands, and open woods where it can receive ample sunlight. Cluster fescue prefers habitats with well-drained soils and dry to mesic conditions (USFS, 2002).
- **Goldenseal** is often found in mesic deciduous forests woodlands, woodland edges, and woodland paths where it grows in the rich, moist soils beneath the canopy of trees. It prefers habitats with a moderate amount of shade, particularly in the understory of forests and with rich, well-drained soils that are moist but not waterlogged. It commonly grows in areas with loamy or sandy soils that have good drainage and retain moisture well (Hilty, 2020).
- **Hispid false mallow** is found in open, disturbed habitats, including roadsides, prairies, fields, pastures, and other areas with disturbed soils. It can also colonize abandoned agricultural fields, construction sites, and other areas where the soil has been disturbed. It commonly grows in limestone and dolomite outcrops and shallow soil. It is often found in habitats with variable moisture levels, including areas that experience periodic drought or occasional flooding (Northwest Wildflowers, 2025).
- **Pitcher's stitchwort** is often found in habitats including barrens, limestone glades and bluffs with shallow soil (limestone near the surface). (USFS, 2003).
- **American ginseng** is often found in mesic deciduous forests and woodlands, where it grows in the rich, moist soils beneath the canopy of trees. Typically these woodlands are high quality and little – disturbed. It prefers habitats with a moderate amount of shade, particularly in the understory of forests and with rich, well-drained soils with abundant organic matter (Hilty, 2020).
- **Canada burnet** is often found in wetland habitats, including wet to moist prairies, primarily along railroads. It can also be found in low areas such as rivers, bogs, fens and swamps. It can tolerate periodic flooding and often grows in areas with seasonally saturated soils. It commonly grows in

areas where the water table is close to the surface or where there is periodic inundation, such as in floodplains or low-lying areas and can tolerate some shade, it generally prefers habitats with full sunlight exposure (Hilty, 2020).

- **Hairy valerian** is often found in fens, native prairies, open grasslands, and meadows, and can be found in railroad right-of-ways. These habitats typically have well-drained soils and receive ample sunlight. This species prefers habitats with moist to wet soils. It is commonly found in areas with sufficient moisture, such as moist microsites in rocky soil, wet meadows, and low-lying areas that retain moisture and can tolerate a range of light conditions, from full sunlight to partial shade. However, it typically grows best in habitats with ample sunlight exposure (MNDNR, 2025).
- **Naval corn salad** is often found in open habitats such as fields, meadows, grasslands, and disturbed areas. It can also grow in agricultural fields, gardens, and along roadsides. It prefers habitats with moderately moist to mesic (moderately wet) soils. It can tolerate a range of soil types, including loamy, sandy, or clayey soils, as long as they are well-drained and can grow in a variety of light conditions, from partial shade to full sunlight (Hilty, 2020).

2.1.3 Botanical Survey Results

According to the 2020 and 2024 reevaluation of the botanical sites previously identified in 2013 and 2014 within and adjacent to the project limits, habitat types present within and adjacent to the proposed project limits include wet and mesic black soil prairies, wet and mesic sand prairies, thickets containing grasses and occasional shrubs, woodland borders, abandoned fields, degraded old fields, agricultural land, and high-quality remnant prairies and botanical areas along the UPRR.

Three natural community remnants (botanical sites) were identified within the study limits during the 2020 flora surveys (Sites A, B, and C). These areas include INHS Sites 5, 9, 10, 11, 12, 13, 14, and 15, which maintain relatively high levels of diversity. The following outlines notable findings from the 2020 and 2024 botanical surveys completed for the proposed project. Figure 2B shows the locations of the botanical sites, prairies, and

- The state-endangered and RFSS species royal catchfly was identified at Botanical Site A in 2020 and 2024, outside of the project limits.
- The state-threatened queen-of-the-prairie was identified at Botanical Site A in 2020 and 2024 outside of the project limits.
- Introduced populations of the federal and state-threatened decurrent false aster were identified at Sites A and B in 2020 and 2024.
- Multiple populations of the rattlesnake master were identified during 2020 and 2024 surveys; four populations consisted of greater than 2,000 individual stems (with the largest population estimated at 5,000+ stems (INHS 2013)).
- One Nature Preserve (Hitts Siding Prairie NP) and two INAI Natural Areas (Joliet Army Ammunition Plant NA and Hitts Siding Prairie NA) are present in the project area.
- Three natural community remnants (botanical sites) were identified, mapped, and evaluated; one is significant, one is exceptional, and one is a noteworthy example of these community types. This was confirmed in the 2024 surveys.
- The state-listed eastern straw sedge was identified throughout the southern portion of Hitt's Siding Prairie within the project limits in 2024;
- The RFSS Species, naval corn salad was identified north of North River Road, along the east and west sides of the RR within the project limits and was observed growing within the RR embankment;

- A population of the native orchid, green twayblade was identified south of Botanical Site A in 2024; and
- The RFSS Species, ear-leaved false foxglove was identified within Botanical Site B in 2024.

H&H conducted flora surveys on the dates presented in Table 2-3. Listed species and species of concern were noted during the field surveys. Table 2-3 lists the species that were likely blooming on each survey date.

Table 2-3: Field Survey Dates and Target Flora Species

Date	Target Species
June 26, 2020	Eastern prairie fringed orchid, grass pink orchid, and Oklahoma grass pink orchid, queen-of-the-prairie, Quarterman's hedge hyssop, large cranberry, tubercled orchid, rattlesnake master
June 28, 2020	Eastern prairie fringed orchid, grass pink orchid, and Oklahoma grass pink orchid, queen-of-the-prairie, Quarterman's hedge hyssop, large cranberry, tubercled orchid, rattlesnake master
June 29, 2020	Eastern prairie fringed orchid, grass pink orchid, and Oklahoma grass pink orchid, queen-of-the-prairie, Quarterman's hedge hyssop, large cranberry, tubercled orchid, rattlesnake master
July 23, 2020	Leafy prairie clover, grass pink orchid, royal catchfly, queen-of-the-prairie, Quarterman's hedge hyssop, tubercled orchid, rattlesnake master
July 28, 2020	Leafy prairie clover, grass pink orchid, royal catchfly, queen-of-the-prairie, Quarterman's hedge hyssop, rattlesnake master
July 30, 2020	Leafy prairie clover, grass pink orchid, royal catchfly, queen-of-the-prairie, Quarterman's hedge hyssop, rattlesnake master
August 5, 2020	Leafy prairie clover, grass pink orchid, royal catchfly, Quarterman's hedge hyssop, rattlesnake master
August 7, 2020	Leafy prairie clover, grass pink orchid, royal catchfly, Quarterman's hedge hyssop, rattlesnake master
August 11, 2020	Leafy prairie clover, decurrent false aster, Quarterman's hedge hyssop, rattlesnake master
August 12, 2020	Leafy prairie clover, decurrent false aster, Quarterman's hedge hyssop, rattlesnake master
August 13, 2020	Leafy prairie clover, decurrent false aster, Quarterman's hedge hyssop, rattlesnake master
August 13, 2020	Leafy prairie clover, decurrent false aster, Quarterman's hedge hyssop, rattlesnake master
September 1, 2020	Leafy prairie clover, decurrent false aster, rattlesnake master
September 3, 2020	Leafy prairie clover, decurrent false aster, rattlesnake master
May 28, 2024	Eastern straw sedge, tubercled orchid, buffalo clover, bulrush, small white lady's slipper, cluster fescue, Quarterman's hedge hyssop, goldenseal, Butler's quillwort, hispid false mallow, Pitcher's stitchwort, American ginseng, Canada burnet, naval corn salad
May 29, 2024	Eastern straw sedge, tubercled orchid, buffalo clover, bulrush, small white lady's slipper, cluster fescue, Quarterman's hedge hyssop, goldenseal, Butler's quillwort, hispid false mallow, Pitcher's stitchwort, American ginseng, Canada

Date	Target Species
	burnet, naval corn salad
June 3, 2024	Eastern straw sedge, tubercled orchid, buffalo clover, bulrush, small white lady's slipper, cluster fescue, Quarterman's hedge hyssop, goldenseal, Butler's quillwort, hispid false mallow, Pitcher's stitchwort, American ginseng, Canada burnet, naval corn salad
June 4, 2024	Eastern straw sedge, tubercled orchid, buffalo clover, bulrush, small white lady's slipper, cluster fescue, Quarterman's hedge hyssop, goldenseal, Butler's quillwort, hispid false mallow, Pitcher's stitchwort, American ginseng, Canada burnet, naval corn salad
June 11, 2024	Eastern straw sedge, tubercled orchid, buffalo clover, small white lady's slipper, cluster fescue, Quarterman's hedge hyssop, goldenseal, Butler's quillwort, hispid false mallow, Pitcher's stitchwort, American ginseng, Canada burnet, naval corn salad
August 6, 2024	Leafy prairie clover, Royal catchfly, decurrent false aster, hispid false mallow, hairy valerian
August 8, 2024	Royal catchfly, decurrent false aster, Hill's thistle
August 13, 2024	Royal catchfly, decurrent false aster, Ear-leaved false foxglove

Figure 1 in Appendix B depicts the location of federal and state-listed plant species observed within the project corridor during the 2020 and 2024 surveys. Photographic documentation of the federal and state-listed plant species observed within the project corridor and the surrounding habitats are found in Appendix B.

Botanical Sites A, B, and C were identified as high-quality natural remnant prairie communities. Site C meets the INAI criteria for a Category 1 natural area as this site is already a designated Nature Preserve and INAI Site, Site A likely qualifies for the INAI designation as a Category 1 natural area as this site is host to several federal and state listed plant species, and Site B likely qualifies as a Regionally Noteworthy Botanical Resource Area as this site possesses a high quality natural community that is clearly an outstanding example of a specific community type and/or assemblage of community types. Sites A, B, and C are described in detail below and mapped in Appendix B, Figure 1. Table 2-3 summarizes the characteristics of the Botanical Resource Areas within the ESR limits. Photographic documentation and FQAs for the botanical sites are located in Appendix B.

In addition, many of the INHS 2013 and 2014 prairies maintain relatively high levels of diversity although some have been degraded or overtaken by shrubs and trees, while others have been developed or are now submerged beneath water. These prairies are also included in Appendix B, Figure 1.

The botanical sites and INHS prairies are mapped in Appendix B, Figure 1. Photographic documentation and FQAs for the botanical sites are located in Appendix B. The high-quality Botanic Resource Areas (Sites A, B, and C) are described in detail below.

Site A (Wet-Mesic Remnant Prairie – Grade C+ Midewin National Tallgrass Prairie)

Site A is an intergrading wet-mesic to mesic remnant prairie located on the west side of the UPRR, between mile post (MP) 49.95 and MP 50.42 (Appendix B, Figure 1, Sheet 2). This prairie possesses a notable assemblage of vascular plant species and retains a high degree of native character (Grade C+).

Site A coincides with rattlesnake master Population G, a large population of rattlesnake master consisting of over an estimated 5,000 individual plants (INHS 2014). The southern portion of Site A includes INHS Site 6 (INHS 2014). INHS Site 6 was described as "foxglove wetland", featuring a sedge meadow and wet prairie understory. The INHS survey report noted the presence of moderate-to-severe woody infiltration at INHS Site 6, particularly infiltration of less conservative species, but also the vigor of the herbaceous understory in areas with open canopy. The natural communities at this site were considered Grade C in 2014, and due to degradation of the habitat, this area is thought to have strong potential for restoration efforts. Standing water has changed the overall composition of INHS Site 6, which has become overgrown with sandbar willow (*Salix interior*) and common reed.

In 2024, a total of 188 vascular plant species (160 native [85.0%] and 28 adventives [15.0%]) were observed at this site during 2020 and 2024 surveys. Thirty-one (16.5%) species at this site are conservatives (C-values between 7 to 10), some of which include: purple prairie clover (*Dalea purpurea*, C = 9), rattlesnake master (C = 9), Queen-of-the-prairie (C = 10), prairie sunflower (*Helianthus rigidus*, C = 9), great St. John's wort (*Hypericum ascyron*, C = 10), royal catchfly (C = 10), and prairie dropseed (*Sporobolus heterolepis*, C = 10).

Matrix species (those with C values of 4-6; relatively conservative species associated with areas that have not been degraded) represent 41.3% (66 species) of the native flora. Native ruderal species (native species with C values of 0-3; often associated with areas that have been degraded) represent 37.5% (60 species) of the native flora. The native FQI for Prairie Site A is 53.1 (49.0 with adventive species) and the native mean C-value is 4.2 (3.6 with adventive species). Three listed plant species were also identified within this site, the state-endangered royal catchfly, the state-threatened queen-of-the-prairie, and the federal and state-threatened decurrent false aster[1].

Results of the FQA support the designation of this site as an Exceptional Botanical Resource Area. Specific evidence to support this conclusion include; the presence of state-listed plant species, the high diversity of native species (n = 160), a relatively high native FQI and native mean C-value (53.1 and 4.2, respectively), the high number of conservative species at this site (19.4% of native flora), and the relatively low number of adventive species (15.0% of total flora). Additionally, this site is located on protected federal lands.

The most immediate and apparent threats to this remnant prairie are invasive, adventive species encroachment (including native and adventive species). The majority of the adventive species present at this site were not abundant (although some were present), but many of the adventive species are known to be highly invasive and their populations may increase. It appeared that management is occurring within this site.

Areas immediately east of this site, narrow segments of Site A bordering railroad ballast, harbor the greatest concentration of adventive and/or invasive, weedy species. Adventive, invasive, and/or weedy native herbaceous species likely to spread and eventually displace native vegetation within this site include sandbar willow, Canadian thistle (*Cirsium arvense*), Queen Anne's lace (*Daucus carota*), tall boneset (*Eupatorium altissimum*), Tatarian honeysuckle (*Lonicera tatarica*), white sweet clover (*Melilotus alba*), and reed canary grass (*Phalaris arundinacea*). The area south of this site includes wetland habitat of moderate quality and agricultural land.

[1] While listed as a federal and state-threatened species, decurrent false aster is not endemic to the Chicago Region of Illinois and is therefore calculated as an adventive species in the FQA.

Site B (Wet-Mesic Remnant Prairie – Grade C Midewin National Tallgrass Prairie)

Site B is an intergrading wet-mesic to mesic remnant prairie located on the east side of the UPRR, between mile post (MP) 49.95 and MP 50.42 (Appendix B, Figure 2B, Sheets 2 and 3). This prairie possesses a notable assemblage of vascular plant species and retains a high degree of native character (Grade C+). Site B is within the Mola Restoration site of Midewin National Tallgrass Prairie.

Site B coincides with Botanical Site 5 and rattlesnake master Population H, as identified within the INHS 2014 Botanical Survey. Population H is a relatively large population, consisting of more than an estimated 2,500 individual plants. Botanical Site 5 was identified as Mola Prairie Remnant in the 2014 INHS Botanical Survey Report and was described as a wet-mesic prairie remnant. The vegetative community was considered Grade C and has been managed throughout recent years with methodology including prescribed burns. The description of Site 5 in the 2014 INHS Botanical Survey Report is consistent with the current status of Botanical Site B, based on 2020 surveys.

In 2024, a total of 194 vascular plant species (165 native [85.0%] and 26 adventives [15.0%]) were observed at this site during 2020 and 2024 surveys. Thirty-three (17.0%) species at this site are conservatives (C-values between 7 to 10), some of which include: rattlesnake master (C = 9), Illinois tick-trefoil (*Desmodium illinoense*, C = 9), sharp-wing-monkey-flower (*Mimulus alatus*, C = 9), purple rattlesnake-root (*Nabalus racemosus*, C = 10), and prairie dropseed (C = 10).

Matrix species (those with C values of 4-6; relatively conservative species associated with areas that have not been degraded) represent 38.2% (63 species) of the native flora. Native ruderal species (those with C values of 0-3; often associated with areas that have been degraded) represent 40.0% (66 species) of the native flora. The native FQI for Prairie Site B is 53.4 (49.3 with adventive species) and the native mean C-value is 4.2 (3.5 with adventive species). One listed plant species was also identified within this site, the federal and state-threatened decurrent false aster[2]. Although federally listed, decurrent false aster is not listed in Will County and is not endemic to the Chicago Region. The populations present at Midewin were accidentally planted during restoration of the area (INHS 2014).

Results of the FQA support the designation of this site as a Regionally Noteworthy Botanical Resource Area. Specific evidence to support this conclusion include; the presence of state-listed plant species, the high diversity of native species (n = 165), a relatively high native FQI and native mean C-value (53.4 and 4.2, respectively), the high number of conservative species at this site (20.0% of native flora), and the relatively low number of adventive species (15.0% of total flora). Additionally, this site is located on protected federal lands.

The most immediate and apparent threats to this remnant prairie are invasive, adventive species encroachment (including native and adventive species). The majority of the adventive species present at this site were not abundant (although some were present), but many of the adventive species are known to be highly invasive and their populations may increase. Management within this area was evident.

Areas immediately west of this site, narrow segments of Site B bordering railroad ballast, harbor the greatest concentration of adventive and/or invasive, weedy species. Adventive, invasive, and/or weedy native

[2] While listed as a federal and state-threatened species, decurrent false aster is not endemic to the Chicago Region of Illinois and is therefore calculated as an adventive species in the FQA.

herbaceous species likely to spread and eventually displace native vegetation within this site include sandbar willow, Canadian thistle, Queen Anne's lace, tall boneset, Tatarian honeysuckle, Canada goldenrod (*Solidago canadensis*), tall goldenrod (*Solidago altissima*), and reed canary grass.

Site C (Wet-Mesic Remnant Sand Prairie – Grade B- Hitts Siding Prairie Nature Preserve)

Prairie Site C is an intergrading wet-mesic to mesic remnant sand prairie located on the west side of the UPRR, between mile post (MP) 53.8 and MP 54.3 (Appendix B, Figure 2B). This prairie possesses a notable assemblage of vascular plant species and retains a high degree of native character (Grade B-).

Site C was identified as Sites 9, 10, 11, 12, 13, 14, and 15 in the 2014 INHS Botanical Survey Report. Communities in these areas were characterized as wet, mesic, and wet-mesic sand prairies, and sedge meadow. Portions of these sites achieved Grade A and B, with some C+ areas adjacent to the railroad line. This area also coincides with rattlesnake master Populations J, K, L, and M in the 2014 INHS Report. These areas consisted of approximately 570 rattlesnake master individuals.

A total of 200 vascular plant species (168 native [84.0%] and 32 adventives [16.0%]) were observed at this site during 2020 and 2024 surveys. Forty-one (20.5%) species at this site are conservatives (C-values between 7 to 10), some of which include: white colic root (*Aletris farinosa*, C = 9), grove-stem Indian plantain (*Arnoglossum plantagineum*, C = 10), green milkweed (*Asclepias hirtella*, C = 10), pawpaw (*Asimina triloba*), Illinois tick-trefoil (C = 9), rattlesnake master (C = 9), bottle gentian (*Gentiana andrewsii*, C = 9), prairie gentian (*Gentiana puberulenta*, C = 9), downy sunflower (*Helianthus mollis*, C = 9), rough rattlesnake-root (*Nabalus asper*, C = 10), purple rattlesnake-root (C = 10), prairie sundrops (*Oenothera pilosella*, C = 10), swamp betony (*Pedicularis lanceolata*, C = 10), and smooth phlox (*Phlox glaberrima interior*, C = 9).

Matrix species (those with C values of 4-6; relatively conservative species associated with areas that have not been degraded) represent 38.7% (65 species) of the native flora. Native ruderal species (those with C values of 0-3; often associated with areas that have been degraded) represent 35.1% (59 species) of the native flora. The native FQI for Prairie Site C is 58.3 (53.4 with adventive species) and the native mean C-value is 4.5 (3.8 with adventive species).

Results of the FQA support the designation of this site as a Significant Botanical Resource Area. Specific evidence to support this conclusion include; the designation of this site as a Nature Preserve and INAI Site, the high diversity of native species (n = 168), a relatively high native FQI and native mean C-value (58.3 and 4.5, respectively), the high number of conservative species at this site (24.4% of native flora), and the relatively low number of adventive species (16.0% of total flora).

The most immediate and apparent threats to this remnant prairie are invasive, adventive species encroachment (including native and adventive species). The majority of the adventive species present at this site were not abundant (although some were present), but many of the adventive species are known to be highly invasive and their populations may increase. In addition, recent work in the utility right-of-way in the eastern portion of Site C was apparent in 2024.

The eastern portions of Site C, bordering railroad ballast, harbor the greatest concentration of adventive and/or invasive, weedy species. Adventive, invasive, and/or weedy native herbaceous species likely to spread and eventually displace native vegetation within this site include sandbar willow, common reed, Canadian thistle, Queen Anne's lace, Tatarian honeysuckle, Canada goldenrod, tall goldenrod, and reed canary grass.

This area also appeared to have recent disturbance in 2024.

Table 2-2: Regionally Noteworthy Botanical Resource Areas Summary Table

Prairie Site	Community Type	Native FQI/Native Mean C-value	Conservative Species Present (% of Natives)[1]	Matrix Species Present (% of Natives)[1]	Ruderal Species Present (% of Natives)[1]	Listed Species Present? (Y/N?)	Disturbance Level[2]	Grade[3]
A	Wet-mesic remnant prairie	53.1/4.2	19	41	38	Y	2	C+
B	Wet-mesic remnant prairie	53.4/4.2	20	38	40	Y	2	C
C	Wet-mesic remnant sand prairie	58.3/4.5	24	39	35	N	2	B-

[1] Calculation does not include non-native species. As a result, the percentages listed across rows may not total 100%.
[2] 1 = disturbance less than 5% of total prairie cover, 2 = disturbance less than 25% of total prairie cover, 3 = disturbance less than 50% of total prairie cover, 4 = disturbance greater than 75% of total prairie cover.
[3] 1 = Native prairie species represent 95 to 100% cover, 2 = Prairie vegetation comprises 55 to 95% of vegetative cover, 3 = Prairie vegetation comprises less than 55% of vegetative cover.

2.2 RATTLESNAKE MASTER BORER MOTH METHODOLOGIES

As a part of the corridor studies for the UPRR High Speed Intercity Passenger Rail project, H&H conducted a survey to determine the presence of the rattlesnake-master borer moth's host plant within and adjacent to the project limits in 2020. Populations of this insect are known to exist adjacent to the project area near Hitts Siding Prairie. The rattlesnake-master borer moth is currently a state threatened species.

Rattlesnake master populations were identified during the 2020 botanical surveys conducted by H&H staff. Survey limits are depicted in Appendix B on the botanical survey (Figure 2B).

According to the USFWS, habitat for the rattlesnake-master borer moth includes remnant prairie and woodland openings that sustain the rattlesnake master plant, the larvae's sole food source. Larvae emerge from eggs in mid-May through early June. Depending on the larvae stage, they will either feed on the leaves or burrow into the stem and/or root of the host plant. Adult rattlesnake-master borer moths emerge from mid-September through mid-October and are active though fall. Positively identifying adults would be difficult as the species is nocturnal (USFWS, August 2013).

H&H surveyed areas of identified rattlesnake master plant populations that will potentially be impacted by construction activities. Of these potentially impacted populations, those investigated include populations that are known to contain greater than or equal to 100 rattlesnake master plants.

During the site visits, H&H documented inspected individual plants for bore holes on the stems and leaves within and immediately adjacent to the project limits. Surveys for bore holes were conducted in September and October, after emergence of the moths. If present, the plant's location was recorded.

2.2.1 Rattlesnake Master Borer Moth Survey Results

Table 2-4 summarizes the results of the rattlesnake master survey. Ten populations of the rattlesnake master were identified within or adjacent to the project limits. Smaller populations were counted, and large population estimates were based on previous surveys (INHS 2013) and confirmed in the field. Ten populations were identified in the 2020 survey. Eight bore holes within Population C1 were identified. The discovery of bore holes indicates the potential presence of the rattlesnake-master borer moth within the project limits. A photo log from the site visits is located in Appendix C.

Table 2-5: Rattlesnake Master Populations

Mile Post	Rattlesnake Master Survey Location	Approximate Number of Rattlesnake Master Population	Approximate Number of Bore Holes Observed*
46.8	Population H	70	NA
47.1	Population G	100	None
47.1	Population F	>1,300	None
49.9 to 50.3	Population A	>5,000	None
49.9 to 50.3	Population B	>3,000	None
53.9	Population C3	150	None
54.0	Population C2	300	None
54.15 to 54.25	Population C1	>2,500	8
54.4	Population E	>100	None
55.1	Population D	75- 100	None

* Only portions of rattlesnake master populations greater than 100 and within the project limits were investigated for bore holes.

2.3 AVIAN SURVEYS

Migratory bird habitat and grassland bird habitat exist throughout the project corridor. Based on coordination with the IDNR and Midwin, H&H conducted meander surveys conducting visual observations for the loggerhead shrike and the upland sandpiper in 2013. These surveys were updated in 2020. To conduct visual surveys, biologists made visual observations within areas of potential habitat for loggerhead shrike and upland sandpiper birds seen or heard. H&H relied upon both the loggerhead shrike and upland sandpiper calls using the Cornell Lab of Ornithology online bird guide (Cornell, 2024).

Surveys were conducted within areas of potential habitat for each species as depicted on the Avian Survey Site Location Map (Figure 3B). All encountered loggerhead shrike and upland sandpiper birds, identified by sight or sound, were recorded. H&H also documented and will forward any confirmed observation of the survey species and coordinate locations using Element Occurrence Record (EOR) forms. Any encountered threatened and/or endangered species, other than the survey species, was noted as well.

In addition to the surveys completed for loggerhead shrike and upland sandpiper, a bald eagle nest was observed adjacent to the project limits in Midewin. The nest was observed to be active in 2024. The nest location is shown on Exhibit 1.

2.3.1 Avian Survey Timeframe and Duration

H&H conducted surveys during the migration season for loggerhead shrike and upland sandpiper within the areas identified as potential habitat for each species. Surveys were conducted between late June and early August 2020 for the upland sandpiper and between late June and mid-October 2020 for the loggerhead shrike during their summer and fall migrations.

2.3.2 Avian Survey Boundaries

The survey boundaries for both species are depicted on Figure 3B within Appendix D. The survey settings are based on the August 2011 IDNR Natural Resource Assessment maps received for the High Speed Rail Corridor, which shows areas in which both bird species are located, as well as areas identified as having potential habitat for the survey species based upon on-the-ground field surveys conducted by H&H for listed flora in 2011 and 2020 and rusty patched bumble bee in 2020.

All areas identified as having potential habitat were surveyed, with special attention to Midewin adjacent to the project limits, which contains the highest potential habitat for the aforementioned species.

2.3.3 Bird Species Habitat, Natural History, and Characteristics

2.3.3.1 Loggerhead Shrike

According to the "The Birds of North America", the loggerhead shrike is a summer migrant in Illinois, during its breeding season (Yosef, 1996). Loggerhead shrikes breed from Washington, northern Alberta, central Saskatchewan, and southern Manitoba, south to California and Florida, and east to southwestern Minnesota, southern Wisconsin, northern Illinois, southern Michigan, and Maryland (Dechant et al., 2001).

Loggerhead shrikes prefer open habitat characterized by grasses and forbs of low stature interspersed with bare ground and shrubs or low trees. Loggerhead shrikes use prairies, pastures, sagebrush (Artemisia) desert, and fencerows or shelterbelts of agricultural fields, as well as old orchards, riparian areas, open woodlands, farmsteads, suburban areas, mowed road ROW, abandoned railroad ROW, cemeteries, golf courses, and reclaimed strip mines (Dechant et al., 2001). Scattered shrubs or trees, particularly thick or thorny species, serve

as nesting substrates and hunting perches. Thorny shrubs or trees also serve as impaling stations. In the upper Midwest, abundance of open habitat, foraging areas, and elevated perch sites were considered the most important factors in habitat suitability.

Loggerheads are permanent residents of southern Illinois, and they breed in northern and central Illinois as well. Shrikes that nest in the northern United States appear throughout the state during migration. Nests are built in Osage orange, locust, hawthorn, and wild crabapple, and usually contain from five to seven gray-colored eggs with brown spots.

It is not known what triggers migration for this species (Poole, 1992); however, it seems that the loggerhead shrike will migrate within ten days or less upon snow cover (Yosef, 1996).

2.3.3.1.1 Upland Sandpiper

According to the "The Birds of North America", the upland sandpiper is a summer migrant in Illinois, during its breeding season (Yosef, 1996). Upland sandpipers breed from central Maine west through Canada to southern Alaska; southeast to northern Utah, northwestern Oklahoma and northern Texas; and east to central Tennessee, Virginia and Maryland. They winter in South America from southern Brazil to south-central Argentina. The birds leave the pampas early in February, reaching the Gulf Coast of the United States in March. Their major northward migration occurs between the Rocky Mountains and the Mississippi River; however, a smaller migration occurs along the east coast.

The upland sandpiper breeding habitat is restricted primarily to extensive, open tracts of short grassland habitat. They nest in native prairie, dry meadows, pastures, domestic hay fields, short-grass savanna, plowed fields, along highway ROW and on airfields, and in peatlands and scattered woodlands near timberline (Godfrey, 1986). Nesting is also known to occur in dry patches of wet meadows and in blueberry barrens. A survey of nesting habitats in Wisconsin suggests that upland sandpipers favor a level topography with a minimum of tall vegetation edges and proportionately high acreages of agricultural crops which duplicate prairie grasslands in terms of structure (Godfrey, 1986). In Illinois, nesting occurs in the north and central portions of the state, with nests built in a hollow in the ground lined with grass and leaves (IDNR, 2025).

The upland sandpiper begins southward migration unusually early, beginning in mid-July. It spends up to eight months of the year in its winter home in South America, during the austral summer (Houston, 2001). In Illinois, spring migrants arrive in early to mid-April. Fall migration begins in July (IDNR, 2025).

2.3.4 Avian Survey Results

H&H conducted surveys for the loggerhead shrike and the upland sandpiper on the dates presented in Table 2-5. A total of 134 survey-hours were spent conducting the surveys.

Table 2-6: Avian Field Survey Dates and Survey Hours

Date	Species Surveyed	Survey-Hours
June 29th, 2020	Loggerhead shrike and Upland sandpiper	6.0
July 23rd, 2020	Loggerhead shrike and Upland sandpiper	12.0
July 24th, 2020	Loggerhead shrike and Upland sandpiper	6.0
July 28th, 2020	Loggerhead shrike and Upland sandpiper	8.0
July 29th, 2020	Loggerhead shrike and Upland sandpiper	14.0
August 6th, 2020	Loggerhead shrike and Upland sandpiper	12.0
August 12th, 2020	Loggerhead shrike and Upland sandpiper	7.0

Table 2-6: Avian Field Survey Dates and Survey Hours

Date	Species Surveyed	Survey-Hours
August 16th, 2020	Loggerhead shrike	7.0
August 18th, 2020	Loggerhead shrike	7.0
September 1st, 2020	Loggerhead shrike	16.0
September 15th, 2020	Loggerhead shrike	16.0
September 16th, 2020	Loggerhead shrike	16.0
October 10th, 2020	Loggerhead Shrike	3.0
TOTAL		**134.0**

Temperatures ranged from approximately 50°F to 90°F during the field investigations. Because of the limited timeframe between the request for surveys and documentation submittal, surveys were conducted in a variety of weather conditions to match the observation hours from the 2013 H&H avian studies.

Neither loggerhead shrike nor upland sandpiper were observed by H&H staff during any of the survey dates. The loggerhead shrike was observed on multiple occasions by H&H staff during surveys previously conducted in 2012. However, it should be noted that during the flora surveys conducted within Botanical Site A, a dead state-endangered king rail bird (*Rallus elegans*) was observed within this site.

Both species were also reported on eBird, an online database of real-time bird observations, by citizen scientists during the timeframe of the 2020 surveys. Observations were generated from reputable members of the forum with a high degree of confidence in the sighting[3]. All observations of the loggerhead shrike and upland sandpiper documented on eBird within or adjacent to the project corridor occurred at Midewin. Areas of Midewin with suitable habitat for both species is presented in Figure 3B.

2.4 HERPETOFAUNA SURVEY

2.4.1 Introduction

H&H conducted surveys of herpetofauna at select locations adjacent to the HSR improvements at Elwood and Braidwood/Wilmington. Specifically, surveys targeting the state threatened Blanding's turtle (*Emydoidea blandingii*) and ornate box turtle (*Terrapene ornata*), and their appropriate habitat was conducted. Visual encounters for the federally threatened, state endangered eastern massasauga rattlesnake, (*Sistrurus catenatus)* were also to be recorded, though none of the snakes have historically been reported in the study area, and none were expected to be encountered.

H&H previously conducted surveys for each of the above listed species within the HSR corridor for the same herpetofauna of interest in July 2014. Blanding's turtles, ornate box turtles, and massasauga were not encountered during the 2014 surveys.

2.4.2 Materials and Methods

2.4.2.1 Eastern Massasauga Species Biology

The eastern massasauga is a small rattlesnake that lives in shallow wetlands and adjacent uplands in portions of Illinois, Indiana, Iowa, Michigan, Minnesota, New York, Ohio, Pennsylvania, Wisconsin, and Ontario (USFWS 2013,

[3] Sightings of rare or uncommon bird species are subject to review before the observation can be accepted to the forum. Reviews include the addition of photographic evidence and/or a brief narrative on identifiable field marks, habitat, behavior, etc. (eBird, 2020).

Szyzmanski, 1988). One eastern massasauga population, which is currently thought to be extirpated, was located in Will County, near Beecher, IL. The closest historic population of massasauga are approximately 30 miles away from the HSR project area (Szymanski 1998). Eastern massasauga rattlesnakes were not encountered during the July 2014 surveys within the HSR corridor. Massasauga are not expected to occur in the HSR project area, but the species was visually surveyed for in its suitable habitat during ornate box turtle surveys.

2.4.2.2 Ornate Box Turtle Species Biology

The ornate box turtle was formerly widely distributed in prairie habitat but is now rare and listed as a state threatened species in Illinois (Kuhn 2013).

2.4.2.2.1 Species Description

The ornate box turtle is a terrestrial turtle with a shell length of up to six inches. The plastron is hinged, and not keeled. The high domed shell is marked with thick yellow lines radiating out from the center of each scute. The background color of the scutes is deep brown. Females have brown eyes, while males have red eyes (Leger 1960, Phillips et al. 1999).

2.4.2.2.2 Life History

The ornate box turtle matures at eight to nine years (Kansas males) and 10-11 years (Kansas females). Texas populations mature at seven to eight years (Blair 1976). Mating occurs in spring or late summer/fall. Nesting usually occurs from late May to mid-June in Nebraska (Converse et al. 2005), with June peak nesting occurring in Kansas and southern Wisconsin (Doroff and Keith 1990). Female ornate box turtles lay 1-2 clutches of one to eight eggs. Eggs take nine to 12 weeks to hatch, depending on ambient temperature. Maximum home range diameter in New Mexico was observed to be 32-526 m (mean 276 m) (Nieuwolt 1996). Home range in Kansas averaged about 2 hectares (ha) (Leger 1960). Home range in Texas averaged about 100 m in diameter (Blair 1976). The home range for Wisconsin ornate box turtles was an average of nine ha (Doroff and Keith, 1990). Annual adult survivorship was 81% to 96% in Texas, and 83% in Kansas (Iverson 1991). Annual survival was observed to be 88% in males and 93% in females in western Nebraska (Converse et al. 2005). Egg production is less than 100 percent of the adult female population, with 50% to 63% of Wisconsin females producing eggs in a given year. Their active season is from mid-April through October in Illinois (Phillips et al. 1999).

2.4.2.2.3 Population Dynamics

Leger (1960) estimates the ornate box turtle may live up to 50 years. Kuo and Janzen (2004) found no significant difference in genetic markers in an isolated population of Illinois (Whiteside County) ornate box turtles (370 acres of habitat) and a much larger Nebraska population (1,780 acres). Kuo and Janzen attributed the maintenance of genetic diversity to the longevity of the turtles but cautioned that populations of ornate box turtles continue to decline due to habitat fragmentation, roadway mortality and removal of specimens by collectors.

2.4.2.2.4 Habitat

The ornate box turtle is a prairie species that uses other open canopy habitats such as savanna, pasture, and grasslands. The ornate box turtle is a burrower, often found in sandy soils (Leger, 1960). Wisconsin ornate box turtles were found on remnant prairie areas with deep sandy soil, and avoided agricultural settings (Doroff and Keith, 1990). In Indiana, ornate box turtles are found in open sandy areas, meadows, and sparse woodlands (Minton, 2001).

2.4.2.2.5 Range wide Distribution

The ornate box turtle is distributed in the prairie regions of Illinois, the Great Plains, and southwestern states (Ernst et al., 1994). In the U.S., it is found in Arkansas, Arizona, Colorado, Iowa, Illinois, Indiana, Kansas, Louisiana, Missouri, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, Wisconsin, and Wyoming (NatureServe, 2014).

2.4.2.2.6 Kankakee Distribution

One record of occurrence for the ornate box turtle is located approximately 1.5 miles southwest of Wilmington, Illinois at Hitts Siding Nature Preserve, centered at the coordinates 41.298202°, -88.173734°. The Hitts Siding records include an ornate box turtle record from 2011, as well as a Blanding's turtle record from 2008 (Kuhns 2013).

Huff & Huff, Inc. conducted surveys for the ornate box turtle within the HSR corridor in 2014. Methodology was consistent with that used in the 2020 surveys. Ornate box turtles were not encountered during visual meander surveys in 2014.

2.4.2.3 Blanding's Turtle Species Biology

The Blanding's turtle is a large turtle that frequents vegetated ponds and is listed as endangered in Illinois (Illinois Endangered Species Protection Board 2020).

2.4.2.3.1 Species Description

The Blanding's turtle has a domed shell with a straight shell length of up to ten inches. The Blanding's turtle's plastron is hinged, and it has a conspicuous yellow throat and chin (Ernst et al., 1994).

2.4.2.3.2 Life History

Females typically mature between 14 and 20 years, laying one clutch of eggs per year (Congdon et al., 1983). Blanding's turtles are active from late March through October in Northern Illinois with females travelling up to a mile over land from their home ponds to nest. Nests of up to 19 eggs are laid in sand or sandy loam soils with good drainage and low canopy cover. Females show nesting site fidelity (Congdon et al. 1983; Kuhns et al. 2007). The greatest trapping success occurs from May through mid-July (Benda et al. 2007).

2.4.2.3.3 Population Dynamics

Wild Blanding's turtles may live more than 77 years (Congdon et al. 2001). Rubin et al. (2001) genetically examined Blanding's populations from Nova Scotia, Wisconsin, Michigan, and the Chicago metro area, and found differences in allelic structure that indicated the Chicago metro populations were becoming genetically depauperate.

2.4.2.3.4 Habitat

Blanding's turtles occupy eutrophic habitats such as ponds, marshes, or small lakes with clear water and abundant aquatic vegetation. Blanding's turtles require adjacent uplands for nesting habitat (Ernst et al. 1994).

2.4.2.3.5 Range Wide Distribution

The Blanding's turtle is found in Iowa, Illinois, Indiana, Massachusetts, Maine, Michigan, Minnesota, Montana, Nebraska, New Hampshire, New York, Ohio, Pennsylvania, South Dakota, and Wisconsin.

2.4.2.3.6 Kankakee Distribution

Several discrete areas west of the Kankakee River at Wilmington, Illinois were surveyed for herpetofauna by the Illinois Natural History Survey (INHS) (Kuhns, 2013). Two areas near the HSR corridor had recent records as *Elements of Occurrence* for the state endangered Blanding's turtle and ornate box turtle from 2018.

- A Blanding's turtle record from 2010 was located approximately 2.5 miles NW of Wilmington, IL, centered approximately at 41.327632°, -88.186669°. A Blanding's turtle (2008 record) and an ornate box turtle (2011 record) were located approximately 1.5 miles SW of Wilmington, Illinois at Hitts Siding Nature Preserve, centered at the coordinates 41.298202°, -88.173734°. A Blanding's turtle sighting from 2012 was located approximately 1-mile NW of Wilmington, IL centered at coordinates 41.316159°, -88.168116° (INHS 2013).

Three additional areas were deemed to contain suitable habitat for both the ornate box turtle and the Blanding's turtle. The approximate centers of the three potential habitat locations were designated by the INHS as Illianx-Ves1, Illianx-Ves2 and Illianx-Ves4 by the INHS survey (Ibid 2013).

The 2013 surveys conducted by the INHS (Kuhns, 2013), did not find ornate box turtles or Blanding's turtles during a combined effort of 1,046 trapping hours and seven hours of visual surveys at the identified potential habitat locations.

H&H surveyed locations adjacent to the HSR corridor for Blanding's turtles in 2014, but no Blanding's turtles were encountered.

2.4.3 Survey Areas

Four separate areas were surveyed for Blanding's turtle, ornate box turtle and eastern massasauga as part of the 2020 survey by H&H, as follows:

- **Midewin North** is located in Elwood, Illinois and consists of two areas located west of the HSR tracks that are separated by the Henslow Trail. The northern portion of Midewin North is partially located within the Joliet Army Ammunition Plant INAI site. Midewin North is bound by a fence line associated with Abraham Lincoln National Cemetery to the north, a United States Forest Service access road to the south, and the railroad line between MP 48.6 to 47.6 on the east, and undeveloped land to the west. The approximate center of this area is located at 41.375171° N, -88.131515° W. The habitat at Midewin North consists of mesic and dry prairie, most of which is managed for invasive species and to promote native prairie plant species. A portion of the southern section of this area is not managed and considerable woody infiltration was observed during surveys. For a detailed discussion of the botanical community at this area, refer to section 2.5.3 in the rusty patched bumblebee survey methodology. This area was surveyed for the ornate box turtle and the eastern massasauga.

- **Midewin South** is located in Wilmington, Illinois and consists of two areas roughly rectangular in shape, on either side of the railroad line. Midewin South is bounded by a fertilizer plant to the north, a mesic-wet prairie associated with Midewin National Tallgrass Prairie and the Joliet Army Ammunition Plant INAI Site to the east and west, and a large wetland complex associated with a tributary to the Kankakee River to the south. The Midewin South survey area extends along the railroad line from MP 50.6 to MP 49.9. The approximate center of this area is located at 41.344178° N, -88.138934 W°. Habitat consists of high quality wet-mesic prairie dominated by native prairie species. This area is managed by the U.S. Forest Service to promote high-quality habitat as part of Midewin National Tall Grass Prairie. For a detailed

discussion of the botanical community at this area, refer to section 2.1.3, in which this area is referred to as Botanical Sites A and B. This area was surveyed for the ornate box turtle and the eastern massasauga.

- **Hitts Siding Prairie INAI Site** is located in Wilmington, Illinois, and consists of an irregularly shaped survey area comprised of a primary transect with secondary transects radiating out at various locations. The entirety of the survey area lies within Hitts Siding Prairie INAI Site. This survey area is bound by Strip Mine Road to the north, a sandy prairie with scattered wetlands to the west and east, a densely forested area to the south, and the railroad line between MP 54.3 and 53.7 to the southeast. The approximate center of this area is located at 41.300590° N, -88.171202° W. This area consists of high-quality sandy prairie in the northern portion and mesic-wet prairie to the south and along the railroad line. For a detailed discussion of the botanical community at this area, refer to section 2.1.3, in which this area is referred to as Botanical Site C. This area was surveyed for the ornate box turtle and the eastern massasauga.

- **The Blanding's Turtle Survey Location** is located within an open water lake and wetland complex located in Wilmington, Illinois, south of Coal City Road and west of the railroad line between MP 55.2 and MP 54.9. This area is located immediately south of the Wilmington West Geological Area INAI Site. Surveys at this location consisted of setting traps within the open water areas. As such, the survey location was bound entirely by irregularly spaced upland areas but can generically be stated as bound by Coal City Road to the north and Illinois Route 129 (Washington Street) to the west. The approximate center of this area is located at 41.289062° N, -88.187280° W. When investigated, the deepest portions of the areas surveyed were approximately 4.5 feet deep. Vegetation near the trapping locations consisted of low-quality communities dominated by American white-water lily (*Nymphaea odorata*) and Eurasian water milfoil (*Myriophyllum spicatum*), and the banks of the survey area were lined with thick stands of common reed. This area was surveyed only for Blanding's turtles. Due to the drought occurring at the time of the survey, this was the only area that had enough water to trap for Blanding's turtle.

2.4.4 Survey Protocols

The following survey protocols were used in all habitats, with aquatic traps used in the closest available suitable habitat to the HSR improvements.

Blanding's turtles, and other aquatic turtle species were sampled using two sizes of baited, double throat, hoop traps (15-inch diameter by 28-inch length with five-inch throats, and 29-inch diameter by 47-inch length with 26-inch throats). All traps had five-inch throats (Leger, 1960). Hoop traps were placed so that two to three inches of the trap was above the water's surface to ensure that potentially captured turtles had access to air. Traps were tied to wooden stakes to ensure that traps would stay in their placed positions. Traps were baited with sardines canned in spring water and were checked daily. GPS coordinates were taken of the trap placements. Trapping effort was recorded in trap hours (the number of traps deployed multiplied by the number of hours the traps were deployed).

Visual Encounter Surveys (VES) were conducted daily around both trapping areas and non-trapping areas in both suitable habitat as well as less suitable habitat nearer to the existing railroad lines. Less suitable habitat often was removed from consideration due a habitat assessment during the initial survey. VES hours were calculated as the number of personnel surveying an area multiplied by the number of hours each person spent observing during the survey. VES were primarily used to detect the presence of eastern massasauga and ornate box turtles, although Blanding's turtles may also be encountered terrestrially. VES surveys are a favored means of sampling for terrestrial amphibians and reptiles during timed periods and utilize visual searches of habitat. Logs, rocks, and other cover may be overturned and replaced during searches, and more open habitat may be scanned for fauna. Visual searches may be conducted while moving or may have periods of stationary observation (Heyer et al., 1994, Seltenrich & Pool, 2002).

2.4.5 Results

Surveys for Blanding's turtles were undertaken at the aquatic trapping locations depicted on Figure 4b within Appendix E from September 14 through September 19, 2020. Traps were set for a total of 960 hours, spread out between sets of five small traps and five large traps. No Blanding's turtles were encountered. A total of 66 painted turtles (*Chrysemys picta*), two snapping turtles (*Chelydra serpentina*), and other aquatic fauna (various fish species) were captured and released over the course of the trapping surveys. Table 2-6 presents the trapping records for the 2020 Blanding's turtle survey.

VES were conducted at Midewin North, Midewin South, and Hitts Siding Prairie from September 14 through September 19, 2020. A total of 37 hours was spent on VES at Hitts Siding Prairie, 18 hours at Midewin North, and 12 hours at Midewin South, for a grand total of 67 person-hours of VES surveys. Survey hours are summarized in Table 2-7. No ornate box turtles or massasauga were detected at any of the VES locations. The most encountered species included leopard frog (*Lithobates pipiens*) and eastern garter snake (*Thamnophis sirtalis*).

Appropriate habitat for the ornate box turtle, occurs at Hitts Siding Nature Preserve. Sandy mounds, approximately 14 to 18 inches in diameter and 8 to 10 inches high were observed in the northern portion of Hitts Siding and may be some species of turtle nesting sites. Several sandy mounds had been shallowly dug into by a potential predator. Eggshell fragments were present at one dug sandy area; however, they were not able to be identified. No appropriate habitat occurs along the railroad right-of-way for the ornate box turtle at the Hitts Siding Nature Preserve. Table 2-8 presents the daily data for VES surveys. Photographic documentation is included in Appendix D.

Table 2-7: Specimens Collected During Blanding's Turtle Trapping Surveys

Common Name	Genus species	Numbers									
		9/14/2020	9/15/2020	9/16/2020	9/17/2020		9/18/2020		9/19/2020		Totals
			Small Traps	Small Traps	Small Traps	Large Traps	Small Traps	Large Traps	Small Traps	Large Traps	
Eastern Painted Turtle	*Chrysemys picta*	--	16	5	1	12	15	9	--	8	66
Snapping Turtle	*Chelydra serpentina*	--	--	--	--	--	--	2	--	--	2
Blanding's Turtle	*Emydoidea blandingii*	--	--	--	--	--	--	--	--	--	0
Number of Traps	--	Set traps starting at 9:10 AM	5	5	10		10		10		--
Daily Trap Hours	--	Set traps starting at 9:10 AM	120	120	240		240		240		960

Table 2-8: Specimens Observed During Visual Encounter Surveys for Herpetofauna

Common Name	Genus species	Numbers								
		9/14/2020	9/15/2020			9/16/2020	9/17/2020		9/18/2020[1]	Totals
		Hitts	Hitts	Midewin South	Midewin North	Midewin North	Hitts	Midewin South	Hitts	
Eastern Garter Snake	*Thamnophis sirtalis*	4	1	1	--	--	1	1	1	9
Six-lined Racerunner	*Aspidoscelis sexlineata*	2	--	--	--	--	--	--	1	3
Slender Glass Lizard	*Ophisaurus attenuatus*	1	--	--	--	--	--	--	--	1
Leopard Frog	*Lithobates pipiens*	4	1	--	--	3	--	--	2	10
Green Frog	*Lithobates clamitans*	--	--	--	--	--	--	--	5[2]	5[2]
American Toad	*Anaxyrus americanus*	2	--	--	--	--	--	--	1	3
Brown Snake	*Pseudonaja textilis*	--	--	--	--	--	--	--	1	1
Ornate Box Turtle	*Terrapene ornata*	--	--	--	--	--	--	--	--	0
Eastern Massasauga	*Sistrurus catenatus*	--	--	--	--	--	--	--	--	0
Person-Hours	--	15	6	6	6	12	4	6	12	

[1]One relict shell observed during VES efforts. Species was unable to be identified by the shell.

[2]This species was numerous to the point that an accurate count was not able to be taken at the time of the site investigation.

Table 2-9: Visual Encounter Survey Person-Hours for Herpetofauna

Visual Encounter Survey Location	Total Survey Person-Hours
Midewin North	18
Midewin South	12
Hitts Siding Prairie	37
Total	**67**

2.4.6 Discussion

No Blanding's turtles, ornate box turtles, or eastern massasauga snakes were encountered during a combined aquatic trapping effort of 960 hours at the Blanding's Turtle Trapping Location and a combined VES effort of 67 hours at Midewin North, Midewin South, and Hitts Siding Prairie. The methodology used was successful in detecting painted turtles, snapping turtles, eastern garter snakes, and six-lined racerunners.

The Blanding's Turtle Trapping Location featured habitat suitable for the Blanding's turtle; however, none were encountered during the surveys. Midewin North featured habitat of low quality with no detection of appropriate nesting habitat for Blanding's or ornate box turtles. Midewin South featured habitat of moderate quality with appropriate nesting habitat for ornate box turtle; however, no appropriate habitat occurs near the railroad lines for turtles. Hitts Siding Prairie has high quality habitat and recent sightings of Blanding's and ornate box turtles (2008-2011).

The closest eastern massasauga historical populations are located 30 miles from the study area and were not expected to be encountered.

Railroad line reconstruction and maintenance along the right-of-way in the areas surveyed are not expected to impact Blanding's turtles, ornate box turtles or eastern massasauga.

2.5 RUSTY PATCHED BUMBLE BEE SURVEY

2.5.1 Life History

The rusty patched bumble bee (RPBB) is a social insect forming colonies of a single queen, female workers, and males. Colonies can consist of up to 1,000 individuals in a season. RPBBs have entirely black heads, and workers and males have a reddish patch on the abdomen.

In spring, the solitary queen emerges from hibernation and looks for a suitable nest, which often consists of a small mammal burrow. The queen lays eggs that were fertilized the previous fall. In late spring and summer, the eggs hatch and mature into worker bees, who forage for food and help rear developing larvae. In the late summer, the colony produces males and new queens, who mate in the fall. In the fall, the members of the colony leave or die, while the queen hibernates beneath a few inches of loose soil (USFWS 2019).

2.5.2 Habitat

RPBB are habitat generalists and have been found in a variety of habitats, including prairies, woodlands, marshes, and residential parks and gardens. They serve an important role in pollination and do not depend on any one flower type. The RPBB relies on blooms spanning the seasons, from spring through fall. The RPBB overwinters in upland forests and woodland, as well as edges within 30 meters of these areas. The RPBB nests in upland grassland and shrubland and edges of upland forests and woodlands. Foraging habitat in spring and summer/fall includes upland grasslands, shrublands, forest edges, and palustrine wetlands. Upland forests and woodlands provide spring foraging opportunities if spring ephemerals are present.

2.5.3 Survey Methodology

A meeting was held with USFWS on July 22, 2020 to discuss the project. The USFWS was interested in RPBB surveys occurring just outside of the High Potential Zone (HPZ), which is located between MP 48.0 and MP 49.0. Due to the limited timeframe available yet this season to survey the bees, it was determined to use the photographic methodology.

The USFWS RPBB survey protocols were followed (USFWS, 2019). According to the protocols, the surveys must occur between June and mid-August. Surveys should take place when temperatures are greater than 60 degrees and not during wet conditions. Partially cloudy days can be surveyed if you can still see your shadow. Surveys were conducted at least two hours after sunrise and three hours before sunset.

The USFWS survey protocol for photography only describes effort as "at your discretion" per visit. An RPBB habitat Assessment is not required. Note – the photo can only verify presence, not absence of the RPBB in the surveyed area.

The presence-absence protocol recommends one-person hour per three acres of the best habitat per visit, with four equally spaced sampling periods from mid-June to mid-August. This level of effort is not required for the photography survey protocol.

Four separate areas were surveyed for RPBB as part of the 2020 survey by H&H on July 28, July 29, July 30, August 5, August 7, August 11, August 12, August 13, August 18, and August 21. Survey locations were based on guidance from the USFWS during the July 22, 2020 conference call and were focused on areas with higher concentrations of blooming nectar plants. Figure 5 shows the survey areas, the HPZ, and RPBB habitat in these locations.

In addition, a habitat assessment was completed utilizing data previously collected and adapting it to *Project-Specific Bumble Bee Habitat Quality Assessment* protocols developed by Jason Robinson of the Illinois Natural History Survey (INHS) (Robinson, 2024). This assessment is included in Appendix F.

- **Midewin North –** Habitat at Midewin North consists of mesic and dry prairie, most of which is managed for invasive species and to promote native prairie plant species. Blooming nectar species during the surveys included bee balm (*Monarda fistulosa*), black-eyed Susan (*Rudbeckia hirta*), and yellow coneflower (*Ratibida pinnata*). This area is currently under active restoration, with pesticide applications occurring. Midewin North includes upland grassland and shrubland (foraging) habitat and is partially located within the HPZ.

- **Midewin South –** Habitat consists of high quality wet-mesic prairie dominated by native prairie species. This area is managed by the U.S. Forest Service to promote high-quality habitat as part of Midewin National Tall Grass Prairie. Section 2.1.3 discusses the vegetative community in more detail. Blooming plants during the surveys include culver's root (*Veronicastrum virginicum*), cardinal flower (*Lobelia cardinalis*), wild bergamot, blazing stars (*Liatris* sp.), swamp milkweed (*Asclepias incarnata*), partridge pea (*Chamaecrista fasciculata*), prairie dock (*Silphium terebinthinaceaum*), compass plant (Sil*phium laciniatum*), cup plant (*Silphium perfoliatum*), and black-eyed Susan. Midewin south includes upland grassland and shrubland (foraging) habitat, palustrine wetland (foraging) habitat. Portions were non-habitat due to standing water and lack of flowering vegetation.

- **Hitts Siding Prairie -** This area consists of high-quality sandy prairie in the northern portion and mesic-wet prairie to the south and along the railroad line. Blooming nectar species at Hitts Siding Prairie during the surveys included downy sunflower (*Helianthus mollis*), goldenrods (*Solidago* sp.), common boneset (*Eupatorium perfoliatum*), steeple bush (*Spiraea tomentosa*), blazing stars, Virginia mountain mint

(*Pycnanthemum virginianum),* and blue vervain (*Verbena hastata*). An area was investigated south of Hitts Siding Prairie near Coal City Road that was not part of the botanic site but had a community of purple loosestrife (*Lythrum salicaria*) that usually had bumblebee activity. Hitts Siding Prairie is comprised of upland grassland and shrubland habitat (foraging), palustrine wetland habitat (foraging), upland forest and woodland edges (nesting and foraging) within the survey area.

- **Abraham Lincoln National Cemetery** remnant prairies occur west of the railroad tracks at approximately MP47.0. This area is comprised of degraded prairie remnants mixed with old-field species. Blooming nectar sources during the survey time periods included wild bergamot, yellow coneflower, and black-eyed Susan. This survey area is comprised of upland grassland and shrubland (foraging) habitat.

Table 2-10: Rusty Patched Bumble Bee Survey Effort

Location	Milepost	Survey Date	Number of Blooming Species	Weather	Wind	Survey Area (approx. acres)	Survey Hours	Survey Hours/ acre
Abraham Lincoln National Cemetery	47.0 – 47.1	7/30/2020	0-5	80, cloudy	10-15, gusts	4	2	0.5
Abraham Lincoln National Cemetery	47.0 – 47.1	8/5/2020	0-5	70, partly cloudy	5-10, gusts	4	1	0.25
Abraham Lincoln National Cemetery	47.0 – 47.1	8/12/2020	0-5	75, sunny	0-5, gusts	4	1	0.25
Abraham Lincoln National Cemetery	47.0 – 47.1	8/18/2020	0-5	75, partly cloudy	10 to 15	4	0.75	0.18
TOTAL – Abraham Lincoln National Cemetery							4.75	1.19
Hitts Siding Prairie	53.9-54.3	7/29/2020	>10	80, partly cloudy	10-15, gusts	15	9	0.6
Hitts Siding Prairie	53.9-54.3	8/7/2020	>10	75, partly cloudy	0-5,	15	6*	0.4
Hitts Siding Prairie	53.9-54.3	8/11/2020	>10	75, partly cloudy	5-10, gusts	15	14*	0.93
Hitts Siding Prairie	53.9-54.3	8/21/2020	>10	80, sunny	5 to 10	15	15.5*	1.03
TOTAL – Hitts Siding Prairie							44.5	4.93
Midewin North	47.9	7/30/2020	5-10	80, cloudy	10-15, gusts	4	2.25	0.56
Midewin North	47.9	8/5/2020	5-10	70, partly cloudy	5-10, gusts	4	1.5	0.375
Midewin North	47.9	8/11/2020	5-10	75, sunny	0-5, gusts	4	2	0.5
Midewin North	47.9	8/13/2020	>10	75, partly cloudy	10 to 15	4	3.5	0.875

Table 2-10: Rusty Patched Bumble Bee Survey Effort

Location	Milepost	Survey Date	Number of Blooming Species	Weather	Wind	Survey Area (approx. acres)	Survey Hours	Survey Hours/ acre
Midewin North	47.9	8/18/2020	5-10	75, partly cloudy	10 to 15	4	4.5	0.89
TOTAL – Midewin North							13.75	3.43
Midewin South - East	49.9 to 50.3	7/28/2020	>10	85, partly cloudy	5-10, gusts	20	4.5	0.225
Midewin South - East	49.9 to 50.3	8/5/2020	>10	70, partly cloudy	5-10, gusts	20	4	0.2
Midewin South - East	49.9 to 50.3	8/12/2020	>10	75, sunny	0-5, gusts	20	8.25	0.41
Midewin South - East	49.9 to 50.3	8/18/2020	>10	75, partly cloudy	10 to 15	20	5	0.25
TOTAL – Midewin South East							21.75	1.08
Midewin South - West	49.9 to 50.3	7/28/2020	>10	85, partly cloudy	5-10, gusts	20	2	0.1
Midewin South - West	49.9 to 50.3	8/5/2020	>10	70, partly cloudy	5-10, gusts	20	6	0.3
Midewin South - West	49.9 to 50.3	8/12/2020	>10	75, sunny	0-5, gusts	20	7.5	0.375
Midewin South - West	49.9 to 50.3	8/13/2020	>10	75, partly cloudy	10 to 15	20	5	0.25
Midewin South - West	49.9 to 50.3	8/18/2020	>10	75, partly cloudy	10 to 15	20	7.5	0.375
TOTAL – Midewin South West							28	1.4

2.5.4 Survey Results

RPBB was not found during the surveys. The most abundant bumblebees identified during the survey included brown-belted bumblebee (*Bombus griceocollis)*, Table 2-9 summarizes the bees identified during the survey. Bees were classified as “abundant”, “common”, or “uncommon” based on how often the bee was observed at each location. Abundant is defined as seen multiple times at all survey locations. Common bees were seen at most survey sites at least a half dozen times at each site. Uncommon bees were seen at many of the sites but sporadically. Appendix F includes specific notes and photos for each identification.

Table 2-11: Rusty Patched Bumble Bee Survey Results

Bee Species	Common name	Midewin South East	Midewin South West	Midewin North	Hitts Siding Prairie	Abraham Lincoln National Cemetery
Xylocopa virginica	Carpenter bee	NA	Abundant	NA	NA	NA
Bombus impatiens	Common eastern bumblebee	Common	Abundant	Abundant	Common	Abundant
Bombus vagans	Half-black bumblebee	NA	Uncommon	NA	NA	NA
Bombus griceocollis	Brown-belted bumblebee	Common	Common	Abundant	Abundant	Common

Table 2-11: Rusty Patched Bumble Bee Survey Results

Bee Species	Common name	Midewin South East	Midewin South West	Midewin North	Hitts Siding Prairie	Abraham Lincoln National Cemetery
Bombus fervidus	Yellow bumblebee	NA	Uncommon	NA	NA	NA
Bombus auricomus	Black and gold bumblebee	NA	Uncommon	NA	NA	Uncommon
Bombus pensylvanicus	American bumblebee	NA	NA	Uncommon	Uncommon	NA
Bombus variabilis	Variable cuckoo bumblebee	NA	NA	Uncommon	NA	NA

NA – These species were not identified at this location.

3.0 BRIDGE BAT ASSESSMENTS

In 2024, bridge bat assessments were completed utilizing Appendix D: Bridge/Structure Bat Assessment Form Guidance by FTA/DOT. The purpose of the assessments is to investigate bridges and culverts larger than 4 feet tall for potential presence of bats. Characteristics favorable for bats include cracks in concrete, expansion joints, and cave-like environments.

Indicators of bat presence include staining and guano deposits.

Indicators of bat presence within culvert and bridge structures were not observed within the project limits. The Bridge Bat Assessment Forms are included in Appendix H.

4.0 REGIONAL FORESTER SPECIES

In 2024, the survey was updated to include RFSS species. Only plants were surveyed in 2024. Habitat is present for many species within the corridor in MNTP. Appendix G includes a summary of RFSS species and habitat present within the corridor.

5.0 SUMMARY

H&H conducted surveys of botanic sites, plants, birds, herpetofauna, and RPBB in 2020. Two state listed plants were identified - royal catchfly and queen-of-the-prairie. One federally listed plant was identified – decurrent false aster, which was planted at this location more than 20 years ago. Rattlesnake master and prairie dropseed populations were identified and surveyed as these plants host state-listed insects.

During the flora surveys conducted within Botanical Site A, a dead state-endangered king rail bird was observed within this site in 2020.

In 2024, the botanic survey was updated to include RFSS species. Habitat was assessed for the remaining RFSS species that were not surveyed.

In addition, bridge bat inspections were conducted in 2024. Evidence of bat usage within culvert and bridge structures was not observed.

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APPENDIX A

Site Location Map

0 1,500 3,000
Feet

Topo Source: INHS/USGS 7.5-minute DRG, Plainfield, Joliet, Channahon, Elwood, Coal City, Wilmington, Symerton, Dwight, Campus, Mazon, Gardner 1:24,000 Quadrangles, 1998

Legend

Project Survey Limits

Huff & Huff, Inc.

Figure 1
Elwood to Braidwood Track Construction Project (Tier 8)
Site Location Map
Will County, Illinois
Sheet 1 of 3

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0 1,500 3,000
Feet

Topo Source: INHS/USGS 7.5-minute DRG, Plainfield, Joliet, Channahon, Elwood, Coal City, Wilmington, Symerton, Dwight, Campus, Mazon, Gardner 1:24,000 Quadrangles, 1998

Legend

Project Survey Limits

Huff & Huff, Inc.

Figure 1
Elwood to Braidwood Track Construction Project (Tier 8)
Site Location Map
Will County, Illinois
Sheet 2 of 3

J:\81.0220288.15 WSP-PB HSR WO #28\Figures\PB_IHSIPR_SLM.mxd

0 1,500 3,000
Feet

Topo Source: INHS/USGS 7.5-minute DRG, Plainfield, Joliet, Channahon, Elwood, Coal City, Wilmington, Symerton, Dwight, Campus, Mazon, Gardner 1:24,000 Quadrangles, 1998

Legend

Project Survey Limits

Huff & Huff, Inc.

Figure 1
Elwood to Braidwood Track Construction Project (Tier 8)
Site Location Map
Will County, Illinois
Sheet 3 of 3

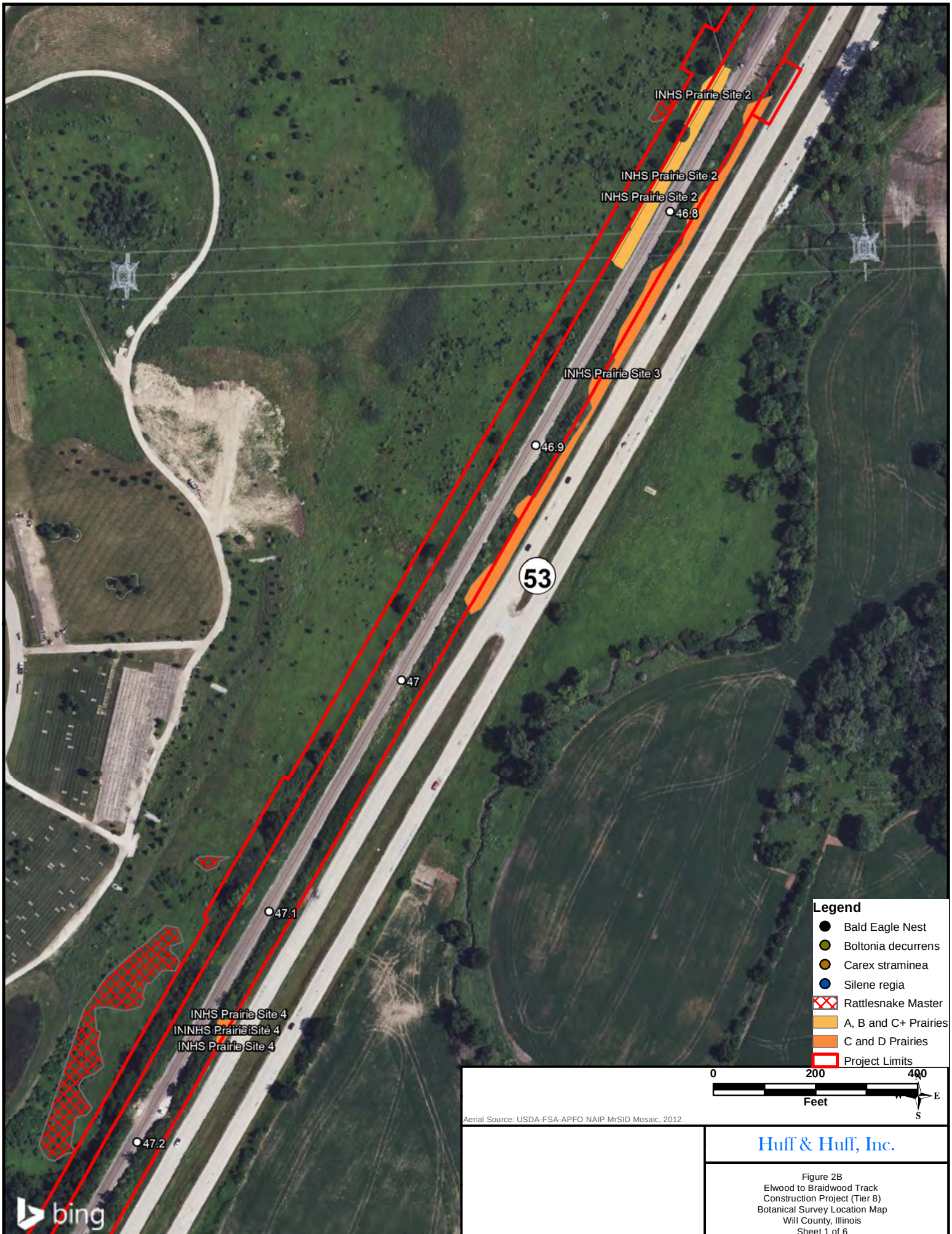
J:\81.0220288.15 WSP-PB HSR WO #28\Figures\PB_IHSIPR_SLM.mxd

APPENDIX B

Botanical Survey Location Map

Botanical Survey Photographic Log

Floristic Quality Assessments



Huff & Huff, Inc.

Figure 2B
Elwood to Braidwood Track
Construction Project (Tier 8)
Botanical Survey Location Map
Will County, Illinois
Sheet 1 of 6

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Aerial Source: USDA-FSA-APFO NAIP MrSID Mosaic, 2012

Huff & Huff, Inc.

Figure 2B
Elwood to Braidwood Track
Construction Project (Tier 8)
Botanical Survey Location Map
Will County, Illinois
Sheet 2 of 6

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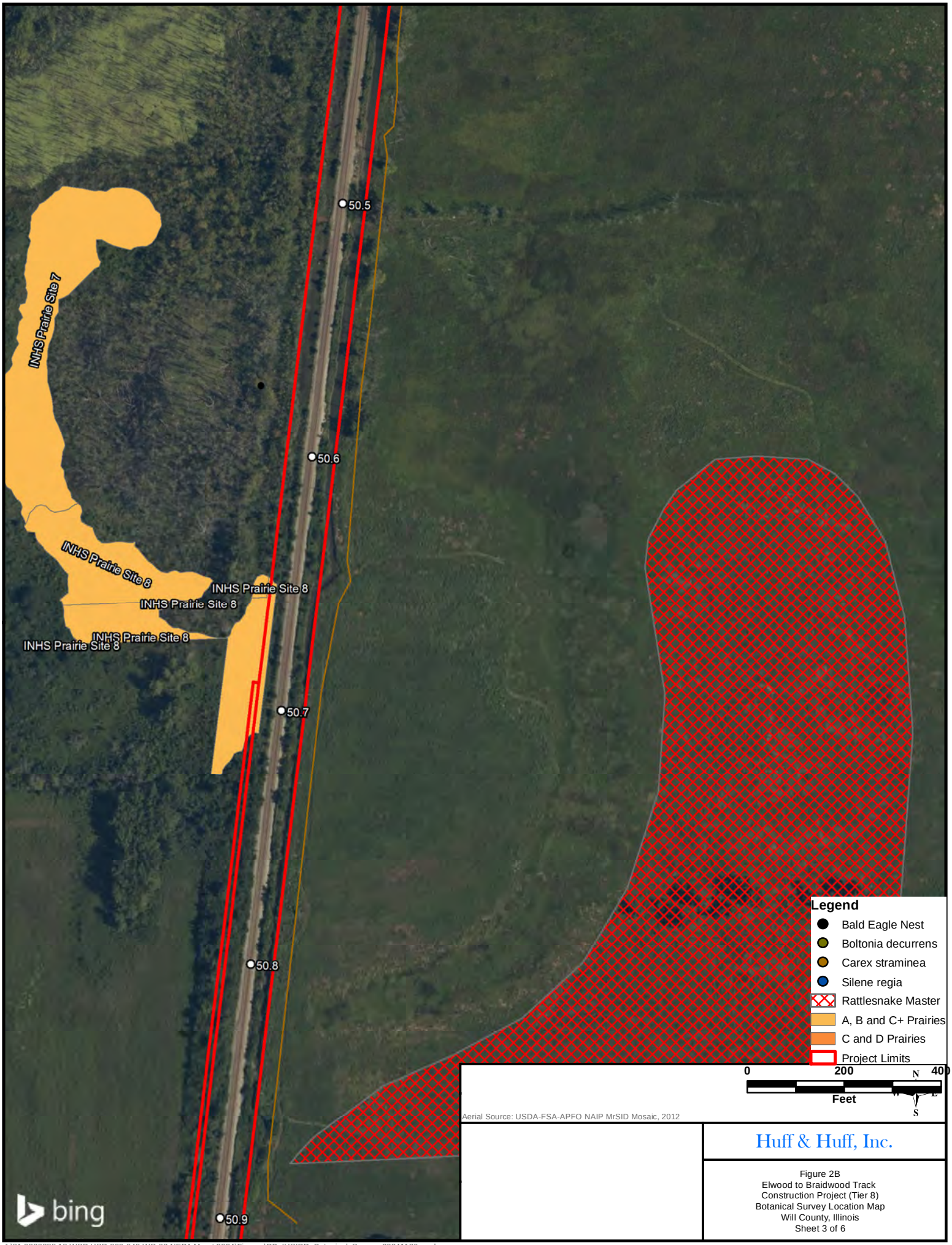

Huff & Huff, Inc.

Figure 2B
Elwood to Braidwood Track
Construction Project (Tier 8)
Botanical Survey Location Map
Will County, Illinois
Sheet 3 of 6

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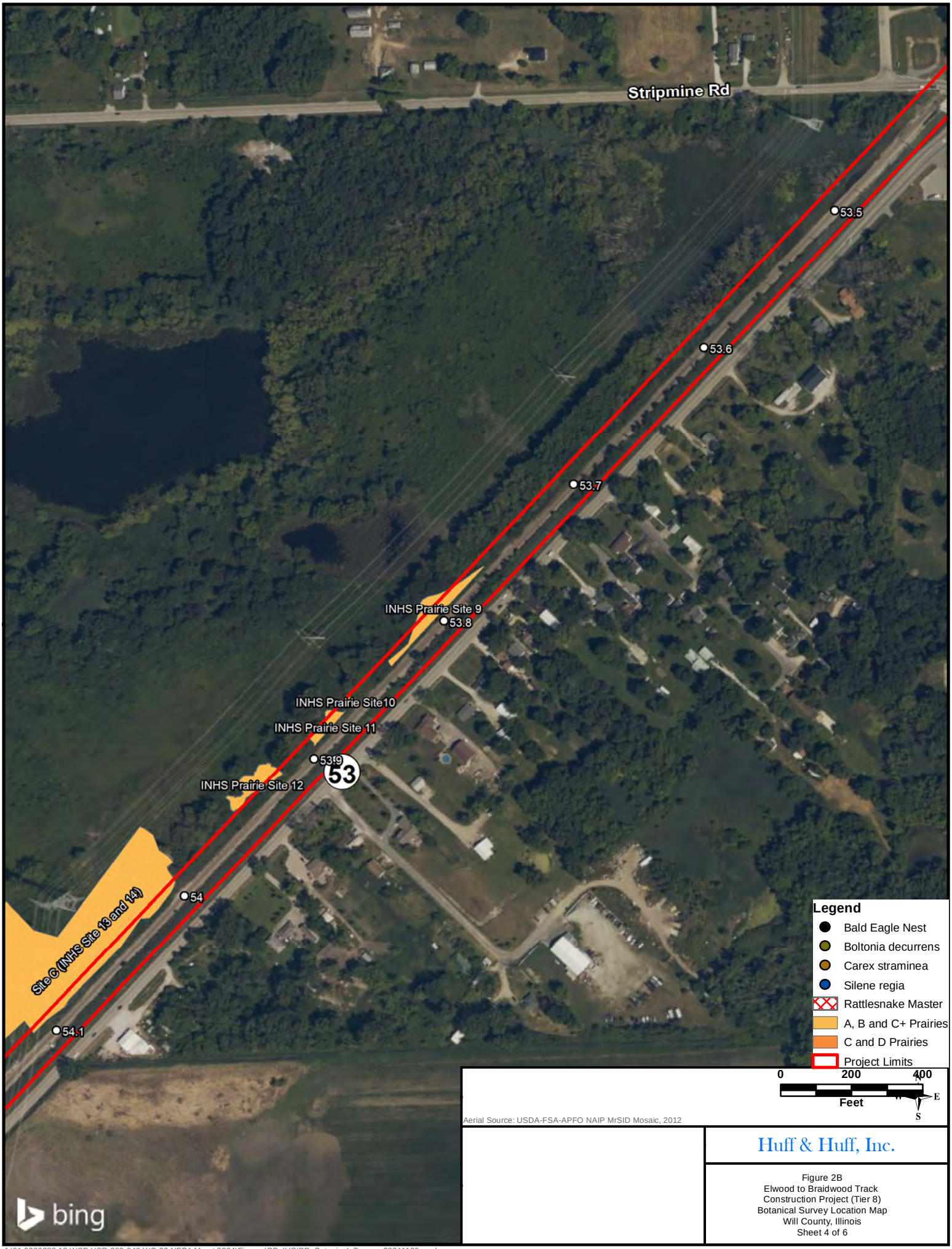

Aerial Source: USDA-FSA-APFO NAIP MrSID Mosaic, 2012

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Figure 2B
Elwood to Braidwood Track
Construction Project (Tier 8)
Botanical Survey Location Map
Will County, Illinois
Sheet 4 of 6

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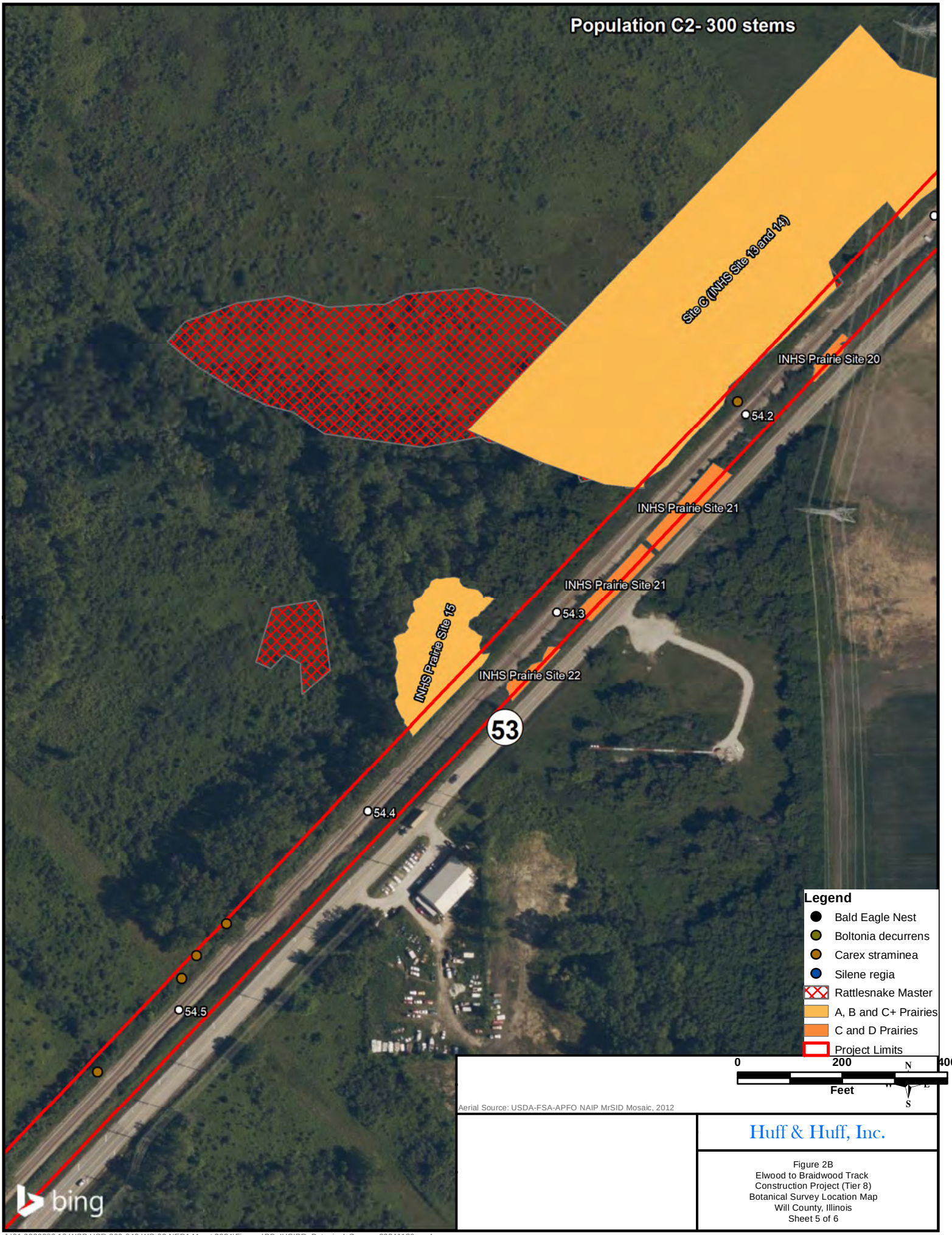

Huff & Huff, Inc.

Figure 2B
Elwood to Braidwood Track
Construction Project (Tier 8)
Botanical Survey Location Map
Will County, Illinois
Sheet 5 of 6

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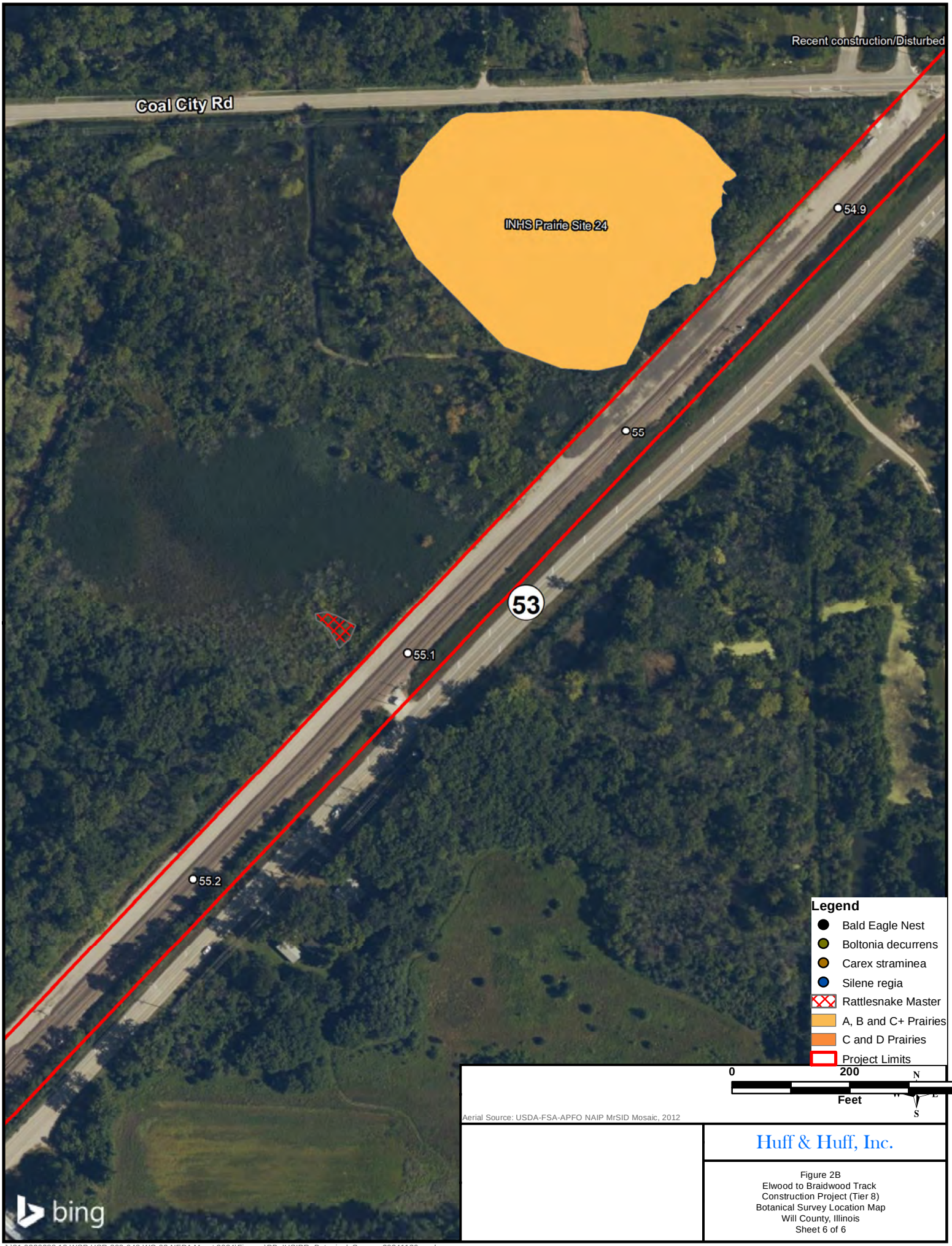

Aerial Source: USDA-FSA-APFO NAIP MrSID Mosaic, 2012

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Figure 2B
Elwood to Braidwood Track
Construction Project (Tier 8)
Botanical Survey Location Map
Will County, Illinois
Sheet 6 of 6

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SITE: Site A

CONSERVATISM-BASED METRICS		ADDITIONAL METRICS	
MEAN C (NATIVE SPECIES)	4.20	SPECIES RICHNESS (ALL)	188
MEAN C (ALL SPECIES)	3.57	SPECIES RICHNESS (NATIVE)	160
MEAN C (NATIVE TREES)	1.33	% NON-NATIVE	0.15
MEAN C (NATIVE SHRUBS)	3.00	WET INDICATOR (ALL)	-0.35
MEAN C (NATIVE HERBACEOUS)	4.35	WET INDICATOR (NATIVE)	-0.45
FQAI (NATIVE SPECIES)	53.13	% HYDROPHYTE (MIDWEST)	0.68
FQAI (ALL SPECIES)	49.01	% NATIVE PERENNIAL	0.76
ADJUSTED FQAI	38.75	% NATIVE ANNUAL	0.08
% C VALUE 0	0.23	% ANNUAL	0.10
% C VALUE 1-3	0.24	% PERENNIAL	0.87
% C VALUE 4-6	0.36		
% C VALUE 7-10	0.17		

SPECIES ACRONYM	SPECIES NAME (NWPL/ MOHLENBROCK)	SPECIES (SYNONYM)	COMMON NAME	C VALUE	MIDWEST WET INDICATOR	NC-NE WET INDICATOR	WET INDICATOR (NUMERIC)	HABIT	DURATION	NATIVITY
ACENEG	Acer negundo	Acer negundo var. violaceum	Ash-Leaf Maple	0	FAC	FAC	0	Tree	Perennial	Native
acocal	Acorus calamus	Acorus calamus	Single-Vein Sweetflag	0	OBL	OBL	-2	Forb	Perennial	Adventive
AGATEN	Agalinis tenuifolia	Agalinis tenuifolia	Slender-Leaf False Foxglove	3	FACW	FACW	-1	Forb	Annual	Native
AGRPAR	Agrimonia parviflora	Agrimonia parviflora	Harvestlice	4	FACW	FAC	-1	Forb	Perennial	Native
AGRGIG	Agrostis gigantea	AGROSTIS ALBA	Black Bent	0	FACW	FACW	-1	Grass	Perennial	Adventive
ALISUB	Alisma subcordatum	Alisma subcordatum	American Water-Plantain	3	OBL	OBL	-2	Forb	Perennial	Native
ALLCAN	Allium canadense	Allium canadense	Meadow Garlic	3	FACU	FACU	1	Forb	Perennial	Native
ALLCER	Allium cernuum	Allium cernuum	Nodding Onion	7	FACU	FACU	1	Forb	Perennial	Native
ALOPRA	Alopecurus pratensis	ALOPECURUS PRATENSIS	Field Meadow-Foxtail	0	FACW	FAC	-1	Grass	Perennial	Adventive
AMBART	Ambrosia artemisiifolia	Ambrosia artemisiifolia elatior	Annual Ragweed	0	FACU	FACU	1	Forb	Annual	Native
AMBTRI	Ambrosia trifida	Ambrosia trifida	Great Ragweed	0	FAC	FAC	0	Forb	Annual	Native
AMMROB	Ammannia robusta	Ammannia robusta	Grand Redstem	4	OBL	OBL	-2	Forb	Annual	Native
ANDGER	Andropogon gerardii	Andropogon gerardii	Big Bluestem	5	FAC	FACU	0	Grass	Perennial	Native
ANECYL	Anemone cylindrica	Anemone cylindrica	Thimbleweed	8	UPL	UPL	2	Forb	Perennial	Native
ANEVIR	Anemone virginiana	Anemone virginiana	Tall Thimbleweed	5	FACU	FACU	1	Forb	Perennial	Native
APOCAN	Apocynum cannabinum	Apocynum sibiricum	Indian-Hemp	2	FAC	FAC	0	Forb	Perennial	Native
ASCINC	Asclepias incarnata	Asclepias incarnata	Swamp Milkweed	3	OBL	OBL	-2	Forb	Perennial	Native
BAPALB	Baptisia alba var. macrophylla	Baptisia leucantha; Baptisia lactea	White Wild Indigo	8	FACU	FACU	1	Forb	Perennial	Native
BIDPOL	Bidens aristosa	Bidens polylepis	Bearded Beggarticks	3	FACW	FACW	-1	Forb	Annual	Native
BIDFRO	Bidens frondosa	Bidens frondosa	Devil's-Pitchfork	1	FACW	FACW	-1	Forb	Annual	Native
BOECYL	Boehmeria cylindrica	Boehmeria cylindrica drummondiana	Small-Spike False Nettle	5	OBL	OBL	-2	Forb	Perennial	Native

BOLDEC	Boltonia decurrens	BOLTONIA DECURRENS	Peoria False Daisy	0	UPL	UPL	2	Forb	Perennial	Adventive
BROINE	Bromus inermis	BROMUS INERMIS	Smooth Brome	0	FACU	UPL	1	Grass	Perennial	Adventive
CALCAN	Calamagrostis canadensis	Calamagrostis canadensis	Bluejoint	6	OBL	OBL	-2	Grass	Perennial	Native
CALSEP	Calystegia sepium	Convolvulus sepium	Hedge False Bindweed	1	FAC	FAC	0	Forb	Perennial	Native
cxbebb	Carex bebbii	Carex bebbii	Bebb's Sedge	8	OBL	OBL	-2	Sedge	Perennial	Native
cxbick	Carex bicknellii	Carex bicknellii	Bicknell's Sedge	8	FACU	FAC	1	Sedge	Perennial	Native
CXBLAN	Carex blanda	Carex blanda	Eastern Woodland Sedge	1	FAC	FAC	0	Sedge	Perennial	Native
CXCRIS	Carex cristatella	Carex cristatella	Crested Sedge	4	FACW	FACW	-1	Sedge	Perennial	Native
cxgran	Carex granularis	Carex granularis	Limestone-Meadow Sedge	3	FACW	FACW	-1	Sedge	Perennial	Native
cxhyst	Carex hystericina	Carex hystericina	Porcupine Sedge	7	OBL	OBL	-2	Sedge	Perennial	Native
CXLUPN	Carex lupulina	Carex lupulina	Hop Sedge	6	OBL	OBL	-2	Sedge	Perennial	Native
CXLURI	Carex lurida	Carex lurida	Sallow Sedge	5	OBL	OBL	-2	Sedge	Perennial	Native
cxmole	Carex molesta	Carex molesta	Troublesome Sedge	2	FAC	FAC	0	Sedge	Perennial	Native
cxsqua	Carex squarrosa	Carex squarrosa	Squarrose Sedge	8	OBL	OBL	-2	Sedge	Perennial	Native
CXSTIP	Carex stipata	Carex stipata	Stalk-Grain Sedge	4	OBL	OBL	-2	Sedge	Perennial	Native
cxstri	Carex stricta	Carex stricta	Uptight Sedge	5	OBL	OBL	-2	Sedge	Perennial	Native
CXVULP	Carex vulpinoidea	Carex vulpinoidea	Common Fox Sedge	2	FACW	OBL	-1	Sedge	Perennial	Native
CHAFAS	Chamaecrista fasciculata	Cassia fasciculata; Cassia fasciculata var. robusta	Sleepingplant	4	FACU	FACU	1	Forb	Annual	Native
CICINT	Cichorium intybus	CICHORIUM INTYBUS	Chicory	0	FACU	FACU	1	Forb	Perennial	Adventive
CICMAC	Cicuta maculata	Cicuta maculata	Spotted Water-Hemlock	6	OBL	OBL	-2	Forb	Perennial	Native
CIRARV	Cirsium arvense	CIRSIUM ARVENSE	Canadian Thistle	0	FACU	FACU	1	Forb	Perennial	Adventive
CIRDIS	Cirsium discolor	Cirsium discolor	Field Thistle	3	FACU	UPL	1	Forb	Biennial	Native
CIRVUL	Cirsium vulgare	CIRSIUM VULGARE	Bull Thistle	0	FACU	FACU	1	Forb	Biennial	Adventive
CORTRI	Coreopsis tripteris	Coreopsis tripteris	Tall Tickseed	5	FAC	FAC	0	Forb	Perennial	Native
CORALB	Cornus alba	Cornus stolonifera; Cornus baileyi; Cornus sericea	Red Osier	5	FACW	FACW	-1	Shrub	Perennial	Native
COROBL	Cornus obliqua	Cornus obliqua	Pale Dogwood	5	FACW	FACW	-1	Shrub	Perennial	Native
CORRAC	Cornus racemosa	Cornus racemosa	Gray Dogwood	1	FAC	FAC	0	Shrub	Perennial	Native
CYPSTR	Cyperus strigosus	Cyperus strigosus	Straw-Color Flat Sedge	1	FACW	FACW	-1	Sedge	Perennial	Native
DALPUR	Dalea purpurea	Petalostemum purpureum	Purple Prairie-Clover	9	UPL	UPL	2	Forb	Perennial	Native
DAUCAR	Daucus carota	DAUCUS CAROTA	Queen Anne’s Lace	0	UPL	UPL	2	Forb	Biennial	Adventive
DESILI	Desmanthus illinoensis	Desmanthus illinoensis	Prairie Bundle-Flower	3	FACU	FACU	1	Forb	Perennial	Native
DESCAA	Desmodium canadense	Desmodium canadense	Showy Tick-Trefoil	4	FACU	FAC	1	Forb	Perennial	Native
DESILL	Desmodium illinoense	Desmodium illinoense	Illinois Tick-Trefoil	9	UPL	UPL	2	Forb	Perennial	Native
ECHCRU	Echinochloa crus-galli	Echinochloa crusgalli	Large Barnyard Grass	0	FACW	FAC	-1	Grass	Annual	Native
ELAANG	Elaeagnus angustifolia	ELAEAGNUS ANGUSTIFOLIA	Russian-Olive	0	FACU	FACU	1	Shrub	Perennial	Adventive
ELEPAL	Eleocharis palustris	Eleocharis erythropoda; Eleocharis palustris major; Eleocharis smallii; Eleocharis xyridiformis; Eleocharis macrostachya	Common Spike-Rush	1	OBL	OBL	-2	Sedge	Perennial	Native

ELYVIR	Elymus virginicus	Elymus virginicus	Virginia Wild Rye	3	FACW	FACW	-1	Grass	Perennial	Native
EPICOL	Epilobium coloratum	Epilobium coloratum	Purple-Leaf Willowherb	3	OBL	OBL	-2	Forb	Perennial	Native
EQUARV	Equisetum arvense	Equisetum arvense	Field Horsetail	0	FAC	FAC	0	Fern	Perennial	Native
EQUHYE	Equisetum hyemale	Equisetum hyemale	Tall Scouring-Rush	1	FACW	FAC	-1	Fern	Perennial	Native
ERYYUC	Eryngium yuccifolium	Eryngium yuccifolium	Button Eryngo	9	FAC	FAC	0	Forb	Perennial	Native
EUPALT	Eupatorium altissimum	Eupatorium altissimum	Tall Boneset	0	UPL	UPL	2	Forb	Perennial	Native
EUPPER	Eupatorium perfoliatum	Eupatorium perfoliatum	Common Boneset	4	OBL	FACW	-2	Forb	Perennial	Native
EUPSER	Eupatorium serotinum	Eupatorium serotinum	Late-Flowering Thoroughwort	0	FAC	FAC	0	Forb	Perennial	Native
SOLGRA	Euthamia graminifolia	Solidago graminifolia; Solidago graminifolia nuttallii; Euthamia nuttallii	Flat-Top Goldentop	4	FACW	FAC	-1	Forb	Perennial	Native
FILRUB	Filipendula rubra	Filipendula rubra	Queen-of-the-Prairie	10	OBL	FACW	-2	Forb	Perennial	Native
FRAVIR	Fragaria virginiana	Fragaria virginiana	Virginia Strawberry	0	FACU	FACU	1	Forb	Perennial	Native
FRAPEN	Fraxinus pennsylvanica	Fraxinus pennsylvanica subintegerrima; Fraxinus lanceolata	Green Ash	4	FACW	FACW	-1	Tree	Perennial	Native
GAUBIE	Gaura biennis	Gaura biennis	Biennial Beeblossom	2	FACU	FACU	1	Forb	Biennial	Native
GEUCAN	Geum canadense	Geum canadense	White Avens	1	FAC	FAC	0	Forb	Perennial	Native
GLYSTR	Glyceria striata	Glyceria striata var. stricta	Fowl Manna Grass	4	OBL	OBL	-2	Grass	Perennial	Native
HELDIV	Helianthus divaricatus	Helianthus divaricatus	Woodland Sunflower	5	UPL	UPL	2	Forb	Perennial	Native
HELGRO	Helianthus grosseserratus	Helianthus grosseserratus	Saw-Tooth Sunflower	4	FACW	FACW	-1	Forb	Perennial	Native
HELRIG	Helianthus pauciflorus	Helianthus rigidus	Prairie Sunflower	9	UPL	UPL	2	Forb	Perennial	Native
HELHEL	Heliopsis helianthoides	Heliopsis helianthoides	Smooth Oxeye	7	FACU	FACU	1	Forb	Perennial	Native
HORJUB	Hordeum jubatum	HORDEUM JUBATUM	Fox-Tail Barley	0	FAC	FAC	0	Grass	Perennial	Native
HYPASC	Hypericum ascyron	Hypericum pyramidatum	Great St. John's-Wort	10	FAC	FAC	0	Forb	Perennial	Native
IMPCAP	Impatiens capensis	Impatiens capensis	Spotted Touch-Me-Not	3	FACW	FACW	-1	Forb	Annual	Native
IRIVIR	Iris virginica var. shrevei	Iris virginica shrevei	Virginia Blueflag	5	OBL	OBL	-2	Forb	Perennial	Native
JUNCAN	Juncus canadensis	Juncus canadensis	Canadian Rush	5	OBL	OBL	-2	Forb	Perennial	Native
JUNDUD	Juncus dudleyi	Juncus dudleyi	Dudley's Rush	2	FACW	FACW	-1	Forb	Perennial	Native
JUNEFF	Juncus effusus ssp. solutus	Juncus effusus	Lamp Rush	5	OBL	OBL	-2	Forb	Perennial	Native
junint	Juncus interior	Juncus interior	Inland Rush	4	FAC	FAC	0	Forb	Perennial	Native
JUNTOR	Juncus torreyi	Juncus torreyi	Torrey's Rush	2	FACW	FACW	-1	Forb	Perennial	Native
LEEORY	Leersia oryzoides	Leersia oryzoides	Rice Cut Grass	3	OBL	OBL	-2	Grass	Perennial	Native
LIAASP	Liatris aspera	Liatris aspera	Rough Gayfeather	8	UPL	UPL	2	Forb	Perennial	Native
LIAPYC	Liatris pycnostachya	Liatris pycnostachya	Cat-Tail Gayfeather	8	FAC	FAC	0	Forb	Perennial	Native
LIASPI	Liatris spicata	Liatris spicata	Dense Gayfeather	7	FAC	FAC	0	Forb	Perennial	Native
liploe	Liparis loeselii	Liparis loeselii	Yellow Wide-Lip Orchid	4	FACW	FACW	-1	Forb	Perennial	Native
LOBCAR	Lobelia cardinalis	Lobelia cardinalis	Cardinal-Flower	7	OBL	OBL	-2	Forb	Perennial	Native
LOBSIP	Lobelia siphilitica	Lobelia siphilitica	Great Blue Lobelia	4	OBL	FACW	-2	Forb	Perennial	Native
LOLPER	Lolium perenne	LOLIUM PERENNE	Perennial Rye Grass	0	FACU	FACU	1	Grass	Perennial	Adventive
LONTAT	Lonicera tatarica	LONICERA TATARICA	Twinsisters	0	FACU	FACU	1	Shrub	Perennial	Adventive

LUDALT	Ludwigia alternifolia	Ludwigia alternifolia	Seedbox	6	OBL	OBL	-2	Forb	Perennial	Native
LUDPAL	Ludwigia palustris	Ludwigia palustris americana	Marsh Primrose-Willow	3	OBL	OBL	-2	Forb	Perennial	Native
LYCAME	Lycopus americanus	Lycopus americanus	Cut-Leaf Water-Horehound	4	OBL	OBL	-2	Forb	Perennial	Native
LYTALA	Lythrum alatum	Lythrum alatum	Wing-Angle Loosestrife	7	OBL	OBL	-2	Forb	Perennial	Native
LYTSAL	Lythrum salicaria	LYTHRUM SALICARIA	Purple Loosestrife	0	OBL	OBL	-2	Forb	Perennial	Adventive
MELALB	Melilotus albus	MELILOTUS ALBA	White Sweet-Clover	0	UPL	UPL	2	Forb	Biennial	Adventive
MENARV	Mentha arvensis	Mentha arvensis villosa; Mentha arvensis subsp. parietariaefolia; Mentha canadensis	American Wild Mint	5	FACW	FACW	-1	Forb	Perennial	Native
MIMRIN	Mimulus ringens	Mimulus ringens	Allegheny Monkey-Flower	4	OBL	OBL	-2	Forb	Perennial	Native
MONFIS	Monarda fistulosa	Monarda fistulosa	Oswego-Tea	4	FACU	FACU	1	Forb	Perennial	Native
MORALB	Morus alba	MORUS ALBA VAR. TATARICA	White Mulberry	0	FAC	FACU	0	Tree	Perennial	Adventive
OENBIE	Oenothera biennis	Oenothera biennis	King's-Cureall	0	FACU	FACU	1	Forb	Biennial	Native
PANCAP	Panicum capillare	Panicum capillare	Common Panic Grass	0	FAC	FAC	0	Grass	Annual	Native
PANVIR	Panicum virgatum	Panicum virgatum	Wand Panic Grass	3	FAC	FAC	0	Grass	Perennial	Native
PARPEN	Parietaria pensylvanica	Parietaria pensylvanica	Pennsylvania Pellitory	0	FACU	FACU	1	Forb	Annual	Native
PARINT	Parthenium integrifolium	Parthenium integrifolium	Wild Quinine	8	UPL	UPL	2	Forb	Perennial	Native
PASSAT	Pastinaca sativa	PASTINACA SATIVA	Parsnip	0	UPL	UPL	2	Forb	Biennial	Adventive
PENDIG	Penstemon digitalis	Penstemon digitalis	Foxglove Beardtongue	4	FAC	FAC	0	Forb	Perennial	Native
PENSED	Penthorum sedoides	Penthorum sedoides	Ditch-Stonecrop	4	OBL	OBL	-2	Forb	Perennial	Native
POLAMP	Persicaria amphibia	Polygonum coccineum; Polygonum amphibium stipulaceum	Water Smartweed	4	OBL	OBL	-2	Forb	Perennial	Native
PERMAC	Persicaria maculosa	POLYGONUM PERSICARIA	Lady's-Thumb	0	FACW	FAC	-1	Forb	Annual	Adventive
PERPUN	Persicaria punctata	Polygonum punctatum	Dotted Smartweed	4	OBL	OBL	-2	Forb	Annual	Native
PHAARU	Phalaris arundinacea	PHALARIS ARUNDINACEA	Reed Canary Grass	0	FACW	FACW	-1	Grass	Perennial	Adventive
PHLPRA	Phleum pratense	PHLEUM PRATENSE	Common Timothy	0	FACU	FACU	1	Grass	Perennial	Adventive
phlgla	Phlox glaberrima ssp. interior	Phlox glaberrima interior	Smooth Phlox	9	FACW	FACW	-1	Forb	Perennial	Native
PHLPIL	Phlox pilosa	Phlox pilosa	Downy Phlox	8	FACU	FACU	1	Forb	Perennial	Native
LIPLAN	Phyla lanceolata	Lippia lanceolata	Northern Frogfruit	4	OBL	OBL	-2	Forb	Perennial	Native
PHYVIR	Physostegia virginiana	Physostegia virginiana	Obedient-Plant	4	FACW	FACW	-1	Forb	Perennial	Native
POAPAS	Poa palustris	Poa palustris	Fowl Blue Grass	7	FACW	FACW	-1	Grass	Perennial	Native
POAPRA	Poa pratensis	POA PRATENSIS	Kentucky Blue Grass	0	FAC	FACU	0	Grass	Perennial	Adventive
POLSAN	Polygala sanguinea	Polygala sanguinea	Purple Milkwort	4	FACU	FACU	1	Forb	Annual	Native
POLBIF	Polygonatum biflorum	Polygonatum canaliculatum	King Solomon's-Seal	4	FACU	FACU	1	Forb	Perennial	Native
POPDEL	Populus deltoides	Populus deltoides	Eastern Cottonwood	0	FAC	FAC	0	Tree	Perennial	Native
PROPAL	Proserpinaca palustris	Proserpinaca palustris	Marsh Mermaidweed	6	OBL	OBL	-2	Forb	Perennial	Native
PYCVIR	Pycnanthemum virginianum	Pycnanthemum virginianum	Virginia Mountain-Mint	5	FACW	FACW	-1	Forb	Perennial	Native
RANABO	Ranunculus abortivus	Ranunculus abortivus	Kidney-Leaf Buttercup	1	FACW	FAC	-1	Forb	Annual	Native
RANACR	Ranunculus acris	RANUNCULUS ACRIS	Tall Buttercup	0	FAC	FAC	0	Forb	Perennial	Adventive

RATPIN	Ratibida pinnata	Ratibida pinnata	Yellow Coneflower	4	UPL	UPL	2	Forb	Perennial	Native
rhycat	Rhynchospora capitellata	Rhynchospora capitellata	Brownish Beak Sedge	8	OBL	OBL	-2	Sedge	Perennial	Native
ROSCAR	Rosa carolina	Rosa carolina	Carolina Rose	5	FACU	FACU	1	Shrub	Perennial	Native
ROSMUL	Rosa multiflora	ROSA MULTIFLORA	Rambler Rose	0	FACU	FACU	1	Shrub	Perennial	Adventive
RUBALL	Rubus allegheniensis	Rubus allegheniensis	Allegheny Blackberry	3	FACU	FACU	1	Shrub	Perennial	Native
RUBOCC	Rubus occidentalis	Rubus occidentalis	Black Raspberry	0	UPL	UPL	2	Shrub	Perennial	Native
RUDHIR	Rudbeckia hirta	Rudbeckia hirta var. pulcherrima	Black-Eyed-Susan	1	FACU	FACU	1	Forb	Perennial	Native
RUDSUB	Rudbeckia subtomentosa	Rudbeckia subtomentosa	Sweet Coneflower	8	FACU	FACU	1	Forb	Perennial	Native
RUMCRI	Rumex crispus	RUMEX CRISPUS	Curly Dock	0	FAC	FAC	0	Forb	Perennial	Adventive
SAGCUN	Sagittaria cuneata	Sagittaria cuneata	Arum-Leaf Arrowhead	7	OBL	OBL	-2	Forb	Perennial	Native
SAGLAT	Sagittaria latifolia	Sagittaria latifolia	Duck-Potato	3	OBL	OBL	-2	Forb	Perennial	Native
SALINT	Salix interior	Salix interior	Sandbar Willow	2	FACW	FACW	-1	Shrub	Perennial	Native
SCIACU	Schoenoplectus acutus	Scirpus acutus	Hard-Stem Club-Rush	5	OBL	OBL	-2	Sedge	Perennial	Native
SCIFLU	Schoenoplectus fluviatilis	Scirpus fluviatilis; Bolboschoenus fluviatilis	River Club-Rush	4	OBL	OBL	-2	Sedge	Perennial	Native
SCIPUN	Schoenoplectus pungens	Scirpus pungens	Three-Square	4	OBL	OBL	-2	Sedge	Perennial	Native
SCIVAL	Schoenoplectus tabernaemontani	Scirpus validus creber	Soft-Stem Club-Rush	3	OBL	OBL	-2	Sedge	Perennial	Native
SCIATV	Scirpus atrovirens	Scirpus atrovirens	Dark-Green Bulrush	4	OBL	OBL	-2	Sedge	Perennial	Native
SCICYP	Scirpus cyperinus	Scirpus cyperinus	Cottongrass Bulrush	6	OBL	OBL	-2	Sedge	Perennial	Native
SCIPEN	Scirpus pendulus	Scirpus pendulus	Rufous Bulrush	2	OBL	OBL	-2	Sedge	Perennial	Native
SCULAT	Scutellaria lateriflora	Scutellaria lateriflora	Mad Dog Skullcap	4	OBL	OBL	-2	Forb	Perennial	Native
SETFAB	Setaria faberi	SETARIA FABERI	Japanese Bristle Grass	0	FACU	FACU	1	Grass	Annual	Adventive
SETPUM	Setaria pumila	SETARIA GLAUCA	Yellow Bristle Grass	0	FAC	FAC	0	Grass	Annual	Adventive
SILREG	Silene regia	Silene regia	Royal Catchfly	10	UPL	UPL	2	Forb	Perennial	Native
SILINT	Silphium integrifolium	Silphium integrifolium var. deamii; Silphium integrifolium var. neglectum	Entire-Leaf Rosinweed	5	UPL	FAC	2	Forb	Perennial	Native
SILLAC	Silphium laciniatum	Silphium laciniatum	Compass-Plant	5	UPL	UPL	2	Forb	Perennial	Native
SILPER	Silphium perfoliatum	Silphium perfoliatum	Cup-Plant	5	FACW	FACW	-1	Forb	Perennial	Native
SILTER	Silphium terebinthinaceum	Silphium terebinthinaceum	Prairie Dock	5	FAC	FAC	0	Forb	Perennial	Native
SIUSUA	Sium suave	Sium suave	Hemlock Water-Parsnip	7	OBL	OBL	-2	Forb	Perennial	Native
SOLALT	Solidago altissima	Solidago altissima	Tall Goldenrod	1	FACU	FACU	1	Forb	Perennial	Native
SOLCAN	Solidago canadensis	Solidago canadensis	Canadian Goldenrod	1	FACU	FACU	1	Forb	Perennial	Native
SOLGIG	Solidago gigantea	Solidago gigantea	Late Goldenrod	4	FACW	FACW	-1	Forb	Perennial	Native
SOLJUN	Solidago juncea	Solidago juncea	Early Goldenrod	3	UPL	UPL	2	Forb	Perennial	Native
SOLNEM	Solidago nemoralis	Solidago nemoralis	Gray Goldenrod	3	UPL	UPL	2	Forb	Perennial	Native
SOLRID	Solidago riddellii	Oligoneuron riddellii	Riddell's Goldenrod	8	OBL	OBL	-2	Forb	Perennial	Native
SOLRIG	Solidago rigida	Oligoneuron rigidum	Hard-Leaf Flat-Top-Goldenrod	3	FACU	FACU	1	Forb	Perennial	Native
SORNUT	Sorghastrum nutans	Sorghastrum nutans	Yellow Indian Grass	5	FACU	FACU	1	Grass	Perennial	Native
SPAPEC	Spartina pectinata	Spartina pectinata	Freshwater Cord Grass	4	FACW	FACW	-1	Grass	Perennial	Native
SPOHET	Sporobolus heterolepis	Sporobolus heterolepis	Prairie Dropseed	10	FACU	FACU	1	Grass	Perennial	Native

ASTERI	Symphyotrichum ericoides	Aster ericoides	White Heath American-Aster	6	FACU	FACU	1	Forb	Perennial	Native
ASTSIM	Symphyotrichum lanceolatum	Aster simplex	White Panicled American-Aster	3	FAC	FACW	0	Forb	Perennial	Native
ASTLAT	Symphyotrichum lateriflorum	Aster lateriflorus	Farewell-Summer	4	FACW	FAC	-1	Forb	Perennial	Native
ASTNOV	Symphyotrichum novae-angliae	Aster novae-angliae	New England American-Aster	3	FACW	FACW	-1	Forb	Perennial	Native
TEUCAN	Teucrium canadense	Teucrium canadense	American Germander	3	FACW	FACW	-1	Forb	Perennial	Native
THADAS	Thalictrum dasycarpum	Thalictrum dasycarpum hypoglaucum	Purple Meadow-Rue	6	FACW	FACW	-1	Forb	Perennial	Native
THAREV	Thalictrum revolutum	Thalictrum revolutum	Waxy-Leaf Meadow-Rue	6	FAC	FAC	0	Forb	Perennial	Native
RHURAD	Toxicodendron radicans	Rhus radicans	Eastern Poison-Ivy	2	FAC	FAC	0	Vine	Perennial	Native
TRIPRA	Trifolium pratense	TRIFOLIUM PRATENSE	Red Clover	0	FACU	FACU	1	Forb	Perennial	Adventive
TRIAURI	Triosteum illinoense	Triosteum aurantiacum illinoense	Illinois Horse Gentian	5	UPL	UPL	2	Forb	Perennial	Native
TYPANG	Typha angustifolia	TYPHA ANGUSTIFOLIA	Narrow-Leaf Cat-Tail	0	OBL	OBL	-2	Forb	Perennial	Adventive
TYPLAT	Typha latifolia	Typha latifolia	Broad-Leaf Cat-Tail	5	OBL	OBL	-2	Forb	Perennial	Native
TYPGLA	Typha X glauca	TYPHA X GLAUCA	Hybrid Cat-Tail	0	OBL	OBL	-2	Forb	Perennial	Adventive
VERHAS	Verbena hastata	Verbena hastata	Simpler's-Joy	4	FACW	FACW	-1	Forb	Perennial	Native
VERURT	Verbena urticifolia	Verbena urticifolia var. leiocarpa	White Vervain	2	FAC	FAC	0	Forb	Perennial	Native
VERFAS	Vernonia fasciculata	Vernonia fasciculata	Prairie Ironweed	8	FACW	FACW	-1	Forb	Perennial	Native
VERVIR	Veronicastrum virginicum	Veronicastrum virginicum	Culver's-Root	8	FAC	FAC	0	Forb	Perennial	Native
VITRIP	Vitis riparia	Vitis riparia var. syrticola	River-Bank Grape	1	FACW	FAC	-1	Vine	Perennial	Native
XANSTR	Xanthium strumarium	Xanthium strumarium var. canadense; Xanthium strumarium var. glabratum	Rough Cockleburr	0	FAC	FAC	0	Forb	Annual	Native
ZIZAUR	Zizia aurea	Zizia aurea	Golden Alexanders	5	FAC	FAC	0	Forb	Perennial	Native

SITE: Site B

CONSERVATISM-BASED METRICS	
MEAN C (NATIVE SPECIES)	4.16
MEAN C (ALL SPECIES)	3.54
MEAN C (NATIVE TREES)	3.50
MEAN C (NATIVE SHRUBS)	3.25
MEAN C (NATIVE HERBACEOUS)	4.26
FQAI (NATIVE SPECIES)	53.41
FQAI (ALL SPECIES)	49.25
ADJUSTED FQAI	38.34
% C VALUE 0	0.24
% C VALUE 1-3	0.25
% C VALUE 4-6	0.33
% C VALUE 7-10	0.18

ADDITIONAL METRICS	
SPECIES RICHNESS (ALL)	194
SPECIES RICHNESS (NATIVE)	165
% NON-NATIVE	0.15
WET INDICATOR (ALL)	-0.37
WET INDICATOR (NATIVE)	-0.53
% HYDROPHYTE (MIDWEST)	0.68
% NATIVE PERENNIAL	0.73
% NATIVE ANNUAL	0.10
% ANNUAL	0.12
% PERENNIAL	0.82

SPECIES ACRONYM	SPECIES NAME (NWPL/ MOHLENBROCK)	SPECIES (SYNONYM)	COMMON NAME	C VALUE	MIDWEST WET INDICATOR	NC-NE WET INDICATOR	WET INDICATOR (NUMERIC)	HABIT	DURATION	NATIVITY
ACARHO	Acalypha rhomboidea	Acalypha rhomboidea	Common Three-Seed-Mercury	0	FACU	FACU	1	Forb	Annual	Native
ACESAI	Acer saccharinum	Acer saccharinum	Silver Maple	1	FACW	FACW	-1	Tree	Perennial	Native
ACHMIL	Achillea millefolium	ACHILLEA MILLEFOLIUM	Common Yarrow	0	FACU	FACU	1	Forb	Perennial	Adventive
ACOAME	Acorus americanus	Acorus americanus	Several-Vein Sweetflag	9	OBL	OBL	-2	Forb	Perennial	Native
AGAAUR	Agalinis auriculata	Tomanthera auriculata	Auriculate False Foxglove	8	UPL	UPL	2	Forb	Annual	Native
AGATEN	Agalinis tenuifolia	Agalinis tenuifolia	Slender-Leaf False Foxglove	3	FACW	FACW	-1	Forb	Annual	Native
AGRPAR	Agrimonia parviflora	Agrimonia parviflora	Harvestlice	4	FACW	FAC	-1	Forb	Perennial	Native
AGRGIG	Agrostis gigantea	AGROSTIS ALBA	Black Bent	0	FACW	FACW	-1	Grass	Perennial	Adventive
ALISUB	Alisma subcordatum	Alisma subcordatum	American Water-Plantain	3	OBL	OBL	-2	Forb	Perennial	Native
ALLCAN	Allium canadense	Allium canadense	Meadow Garlic	3	FACU	FACU	1	Forb	Perennial	Native
ALLCER	Allium cernuum	Allium cernuum	Nodding Onion	7	FACU	FACU	1	Forb	Perennial	Native
AMBART	Ambrosia artemisiifolia	Ambrosia artemisiifolia elatior	Annual Ragweed	0	FACU	FACU	1	Forb	Annual	Native
AMBTRI	Ambrosia trifida	Ambrosia trifida	Great Ragweed	0	FAC	FAC	0	Forb	Annual	Native
AMMROB	Ammannia robusta	Ammannia robusta	Grand Redstem	4	OBL	OBL	-2	Forb	Annual	Native
AMPBRA	Amphicarpaea bracteata	Amphicarpaea bracteata	American Hog-Peanut	5	FAC	FAC	0	Vine	Annual	Native
ANDGER	Andropogon gerardii	Andropogon gerardii	Big Bluestem	5	FAC	FACU	0	Grass	Perennial	Native
ANECAN	Anemone canadensis	Anemone canadensis	Round-Leaf Thimbleweed	4	FACW	FACW	-1	Forb	Perennial	Native
ANECYL	Anemone cylindrica	Anemone cylindrica	Thimbleweed	8	UPL	UPL	2	Forb	Perennial	Native
APIAME	Apios americana	Apios americana	Groundnut	5	FACW	FACW	-1	Forb	Perennial	Native
APOCAN	Apocynum cannabinum	Apocynum sibiricum	Indian-Hemp	2	FAC	FAC	0	Forb	Perennial	Native
ASCINC	Asclepias incarnata	Asclepias incarnata	Swamp Milkweed	3	OBL	OBL	-2	Forb	Perennial	Native
ASCSUL	Asclepias sullivantii	Asclepias sullivantii	Prairie Milkweed	8	FAC	FAC	2	Forb	Perennial	Native
ASCSYR	Asclepias syriaca	Asclepias syriaca	Common Milkweed	0	FACU	UPL	1	Forb	Perennial	Native
ASPOFF	Asparagus officinalis	ASPARAGUS OFFICINALIS	Asparagus	0	FACU	FACU	1	Forb	Perennial	Adventive
BIDPOL	Bidens aristosa	Bidens polylepis	Bearded Beggarticks	3	FACW	FACW	-1	Forb	Annual	Native
BIDCER	Bidens cernua	Bidens cernua	Nodding Burr-Marigold	3	OBL	OBL	-2	Forb	Annual	Native

BIDFRO	Bidens frondosa	Bidens frondosa	Devil's-Pitchfork	1	FACW	FACW	-1	Forb	Annual	Native
BIDCON	Bidens tripartita	Bidens comosa; Bidens connata	Three-Lobe Beggarticks	3	OBL	FACW	-2	Forb	Annual	Native
BOECYL	Boehmeria cylindrica	Boehmeria cylindrica drummondiana	Small-Spike False Nettle	5	OBL	OBL	-2	Forb	Perennial	Native
BOLDEC	Boltonia decurrens	BOLTONIA DECURRENS	Peoria False Daisy	0	UPL	UPL	2	Forb	Perennial	Adventive
CALCAN	Calamagrostis canadensis	Calamagrostis canadensis	Bluejoint	6	OBL	OBL	-2	Grass	Perennial	Native
CALSEP	Calystegia sepium	Convolvulus sepium	Hedge False Bindweed	1	FAC	FAC	0	Forb	Perennial	Native
cxbebb	Carex bebbii	Carex bebbii	Bebb's Sedge	8	OBL	OBL	-2	Sedge	Perennial	Native
cxbick	Carex bicknellii	Carex bicknellii	Bicknell's Sedge	8	FACU	FAC	1	Sedge	Perennial	Native
CXBLAN	Carex blanda	Carex blanda	Eastern Woodland Sedge	1	FAC	FAC	0	Sedge	Perennial	Native
CXCOMO	Carex comosa	Carex comosa	Bearded Sedge	5	OBL	OBL	-2	Sedge	Perennial	Native
CXCRIS	Carex cristatella	Carex cristatella	Crested Sedge	4	FACW	FACW	-1	Sedge	Perennial	Native
cxgran	Carex granularis	Carex granularis	Limestone-Meadow Sedge	3	FACW	FACW	-1	Sedge	Perennial	Native
cxhyst	Carex hystericina	Carex hystericina	Porcupine Sedge	7	OBL	OBL	-2	Sedge	Perennial	Native
CXLACU	Carex lacustris	Carex lacustris	Lakebank Sedge	5	OBL	OBL	-2	Sedge	Perennial	Native
cxlupn	Carex lupulina	Carex lupulina	Hop Sedge	6	OBL	OBL	-2	Sedge	Perennial	Native
CXMOLE	Carex molesta	Carex molesta	Troublesome Sedge	2	FAC	FAC	0	Sedge	Perennial	Native
CXPELL	Carex pellita	Carex pellita	Woolly Sedge	4	OBL	OBL	-2	Sedge	Perennial	Native
cxsqua	Carex squarrosa	Carex squarrosa	Squarrose Sedge	8	OBL	OBL	-2	Sedge	Perennial	Native
cxstip	Carex stipata	Carex stipata	Stalk-Grain Sedge	4	OBL	OBL	-2	Sedge	Perennial	Native
cxstri	Carex stricta	Carex stricta	Uptight Sedge	5	OBL	OBL	-2	Sedge	Perennial	Native
CXVULP	Carex vulpinoidea	Carex vulpinoidea	Common Fox Sedge	2	FACW	OBL	-1	Sedge	Perennial	Native
CICMAC	Cicuta maculata	Cicuta maculata	Spotted Water-Hemlock	6	OBL	OBL	-2	Forb	Perennial	Native
CIRDIS	Cirsium discolor	Cirsium discolor	Field Thistle	3	FACU	UPL	1	Forb	Biennial	Native
CIRVUL	Cirsium vulgare	CIRSIUM VULGARE	Bull Thistle	0	FACU	FACU	1	Forb	Biennial	Adventive
CONARV	Convolvulus arvensis	CONVOLVULUS ARVENSIS	Field Bindweed	0	UPL	UPL	2	Forb	Perennial	Adventive
CORSTO	Cornus alba	Cornus stolonifera; Cornus baileyi; Cornus sericea	Red Osier	5	FACW	FACW	-1	Shrub	Perennial	Native
COROBL	Cornus obliqua	Cornus obliqua	Pale Dogwood	5	FACW	FACW	-1	Shrub	Perennial	Native
CORRAC	Cornus racemosa	Cornus racemosa	Gray Dogwood	1	FAC	FAC	0	Shrub	Perennial	Native
CYPESC	Cyperus esculentus	Cyperus esculentus	Chufa	0	FACW	FACW	-1	Sedge	Perennial	Native
CYPSTR	Cyperus strigosus	Cyperus strigosus	Straw-Color Flat Sedge	1	FACW	FACW	-1	Sedge	Perennial	Native
DAUCAR	Daucus carota	DAUCUS CAROTA	Queen Anne's Lace	0	UPL	UPL	2	Forb	Biennial	Adventive
DESILI	Desmanthus illinoensis	Desmanthus illinoensis	Prairie Bundle-Flower	3	FACU	FACU	1	Forb	Perennial	Native
DESILL	Desmodium illinoense	Desmodium illinoense	Illinois Tick-Trefoil	9	UPL	UPL	2	Forb	Perennial	Native
DICCLA	Dichanthelium clandestinum	Panicum clandestinum	Deer-Tongue Rosette Grass	4	FACW	FACW	-1	Grass	Perennial	Native
DIPLAC	Dipsacus laciniatus	DIPSACUS LACINIATUS	Cut-Leaf Teasel	0	UPL	FACU	2	Forb	Biennial	Adventive
ECHCRU	Echinochloa crus-galli	Echinochloa crusgalli	Large Barnyard Grass	0	FACW	FAC	-1	Grass	Annual	Native
ELAUMB	Elaeagnus umbellata	ELAEAGNUS UMBELLATA	Autumn-Olive	0	UPL	UPL	2	Shrub	Perennial	Adventive
ELEACI	Eleocharis acicularis	Eleocharis acicularis	Needle Spike-Rush	3	OBL	OBL	-2	Sedge	Perennial	Native
ELYCAN	Elymus canadensis	Elymus canadensis	Nodding Wild Rye	4	FACU	FACU	1	Grass	Perennial	Native
ELYVIR	Elymus virginicus	Elymus virginicus	Virginia Wild Rye	3	FACW	FACW	-1	Grass	Perennial	Native
EPICOL	Epilobium coloratum	Epilobium coloratum	Purple-Leaf Willowherb	3	OBL	OBL	-2	Forb	Perennial	Native

EQULAE	Equisetum laevigatum	Equisetum laevigatum	Smooth Scouring-Rush	3	FACW	FACW	-1	Fern	Perennial	Native
ERASPE	Eragrostis spectabilis	Eragrostis spectabilis	Purple Love Grass	3	UPL	UPL	2	Grass	Perennial	Native
ERICAN	Erigeron canadensis	Conyza canadensis	Canadian Horseweed	0	FACU	FACU	1	Forb	Annual	Native
ERYYUC	Eryngium yuccifolium	Eryngium yuccifolium	Button Eryngo	9	FAC	FAC	0	Forb	Perennial	Native
EUPALT	Eupatorium altissimum	Eupatorium altissimum	Tall Boneset	0	UPL	UPL	2	Forb	Perennial	Native
EUPPER	Eupatorium perfoliatum	Eupatorium perfoliatum	Common Boneset	4	OBL	FACW	-2	Forb	Perennial	Native
EUPSER	Eupatorium serotinum	Eupatorium serotinum	Late-Flowering Thoroughwort	0	FAC	FAC	0	Forb	Perennial	Native
EUTGRA	Euthamia graminifolia	Solidago graminifolia; Solidago graminifolia nuttallii; Euthamia nuttallii	Flat-Top Goldentop	4	FACW	FAC	-1	Forb	Perennial	Native
FALSCA	Fallopia scandens	Polygonum scandens; Fallopia cristata	Climbing Black-Bindweed	3	FAC	FAC	0	Vine	Perennial	Native
FRAVIR	Fragaria virginiana	Fragaria virginiana	Virginia Strawberry	0	FACU	FACU	1	Forb	Perennial	Native
FRAPEN	Fraxinus pennsylvanica	Fraxinus pennsylvanica subintegerrima; Fraxinus lanceolata	Green Ash	4	FACW	FACW	-1	Tree	Perennial	Native
GALTIN	Galium tinctorium	Galium tinctorium	Stiff Marsh Bedstraw	8	OBL	OBL	-2	Forb	Perennial	Native
GAUBIE	Gaura biennis	Gaura biennis	Biennial Beeblossom	2	FACU	FACU	1	Forb	Biennial	Native
GERMAC	Geranium maculatum	Geranium maculatum	Spotted Crane's-Bill	5	FACU	FACU	1	Forb	Perennial	Native
GEUCAN	Geum canadense	Geum canadense	White Avens	1	FAC	FAC	0	Forb	Perennial	Native
HELAUT	Helenium autumnale	Helenium autumnale var. canaliculatum	Fall Sneezeweed	5	FACW	FACW	-1	Forb	Perennial	Native
HELANN	Helianthus annuus	HELIANTHUS ANNUUS	Common Sunflower	0	FACU	FACU	1	Forb	Annual	Adventive
HELGRO	Helianthus grosseserratus	Helianthus grosseserratus	Saw-Tooth Sunflower	4	FACW	FACW	-1	Forb	Perennial	Native
HELPAU	Helianthus pauciflorus	Helianthus rigidus	Prairie Sunflower	9	UPL	UPL	2	Forb	Perennial	Native
HELHEL	Heliopsis helianthoides	Heliopsis helianthoides	Smooth Oxeye	7	FACU	FACU	1	Forb	Perennial	Native
HIBLAE	Hibiscus laevis	Hibiscus laevis	Halberd-Leaf Rose-Mallow	7	OBL	OBL	-2	Forb	Perennial	Native
HYPPER	Hypericum perforatum	HYPERICUM PERFORATUM	Common St. John's-Wort	0	FACU	UPL	1	Forb	Perennial	Adventive
IRIVIR	Iris virginica var. shrevei	Iris virginica shrevei	Virginia Blueflag	5	OBL	OBL	-2	Forb	Perennial	Native
JUNDUD	Juncus dudleyi	Juncus dudleyi	Dudley's Rush	2	FACW	FACW	-1	Forb	Perennial	Native
junint	Juncus interior	Juncus interior	Inland Rush	4	FAC	FAC	0	Forb	Perennial	Native
JUNTOR	Juncus torreyi	Juncus torreyi	Torrey's Rush	2	FACW	FACW	-1	Forb	Perennial	Native
LACCAN	Lactuca canadensis	Lactuca canadensis	Canadian Blue Lettuce	1	FACU	FACU	1	Forb	Biennial	Native
LACSER	Lactuca serriola	LACTUCA SERRIOLA	Prickly Lettuce	0	FACU	FACU	1	Forb	Biennial	Adventive
LEEORY	Leersia oryzoides	Leersia oryzoides	Rice Cut Grass	3	OBL	OBL	-2	Grass	Perennial	Native
LOBCAR	Lobelia cardinalis	Lobelia cardinalis	Cardinal-Flower	7	OBL	OBL	-2	Forb	Perennial	Native
LOBSIP	Lobelia siphilitica	Lobelia siphilitica	Great Blue Lobelia	4	OBL	FACW	-2	Forb	Perennial	Native
LUDALT	Ludwigia alternifolia	Ludwigia alternifolia	Seedbox	6	OBL	OBL	-2	Forb	Perennial	Native
LYCAME	Lycopus americanus	Lycopus americanus	Cut-Leaf Water-Horehound	4	OBL	OBL	-2	Forb	Perennial	Native
LYCVIR	Lycopus virginicus	Lycopus virginicus	Virginia Water-Horehound	7	OBL	OBL	-2	Forb	Perennial	Native
lysnum	Lysimachia nummularia	LYSIMACHIA NUMMULARIA	Creeping-Jenny	0	FACW	FACW	-1	Forb	Perennial	Adventive
LYTALA	Lythrum alatum	Lythrum alatum	Wing-Angle Loosestrife	7	OBL	OBL	-2	Forb	Perennial	Native

LYTSAL	Lythrum salicaria	LYTHRUM SALICARIA	Purple Loosestrife	0	OBL	OBL	-2	Forb	Perennial	Adventive
MELALB	Melilotus albus	MELILOTUS ALBA	White Sweet-Clover	0	UPL	UPL	2	Forb	Biennial	Adventive
MIMALA	Mimulus alatus	Mimulus alatus	Sharp-Wing Monkey-Flower	9	OBL	OBL	-2	Forb	Perennial	Native
MIMRIN	Mimulus ringens	Mimulus ringens	Allegheny Monkey-Flower	4	OBL	OBL	-2	Forb	Perennial	Native
MONFIS	Monarda fistulosa	Monarda fistulosa	Oswego-Tea	4	FACU	FACU	1	Forb	Perennial	Native
NABALB	Nabalus albus	Prenanthes alba	White Rattlesnake-Root	5	FACU	FACU	1	Forb	Perennial	Native
NABRAC	Nabalus racemosus	Prenanthes racemosa	Purple Rattlesnake-Root	10	FACW	FACW	-1	Forb	Perennial	Native
OENBIE	Oenothera biennis	Oenothera biennis	King's-Cureall	0	FACU	FACU	1	Forb	Biennial	Native
PANCAP	Panicum capillare	Panicum capillare	Common Panic Grass	0	FAC	FAC	0	Grass	Annual	Native
PANVIR	Panicum virgatum	Panicum virgatum	Wand Panic Grass	3	FAC	FAC	0	Grass	Perennial	Native
PARINT	Parthenium integrifolium	Parthenium integrifolium	Wild Quinine	8	UPL	UPL	2	Forb	Perennial	Native
PASSAT	Pastinaca sativa	PASTINACA SATIVA	Parsnip	0	UPL	UPL	2	Forb	Biennial	Adventive
PENDIG	Penstemon digitalis	Penstemon digitalis	Foxglove Beardtongue	4	FAC	FAC	0	Forb	Perennial	Native
PENSED	Penthorum sedoides	Penthorum sedoides	Ditch-Stonecrop	4	OBL	OBL	-2	Forb	Perennial	Native
POLHYD	Persicaria hydropiper	Polygonum hydropiper	Mild Water-Pepper	2	OBL	OBL	-2	Forb	Annual	Native
PERHYO	Persicaria hydropiperoides	Polygonum opelousanum adenocalyx	Swamp Smartweed	6	OBL	OBL	-2	Forb	Perennial	Native
PERMAC	Persicaria maculosa	POLYGONUM PERSICARIA	Lady's-Thumb	0	FACW	FAC	-1	Forb	Annual	Adventive
PERPEN	Persicaria pensylvanica	Polygonum pensylvanicum	Pinkweed	0	FACW	FACW	-1	Forb	Annual	Native
PERPUN	Persicaria punctata	Polygonum punctatum	Dotted Smartweed	4	OBL	OBL	-2	Forb	Annual	Native
PHAARU	Phalaris arundinacea	PHALARIS ARUNDINACEA	Reed Canary Grass	0	FACW	FACW	-1	Grass	Perennial	Adventive
PHLGLA	Phlox glaberrima ssp. interior	Phlox glaberrima interior	Smooth Phlox	9	FACW	FACW	-1	Forb	Perennial	Native
PHLPIL	Phlox pilosa	Phlox pilosa	Downy Phlox	8	FACU	FACU	1	Forb	Perennial	Native
LIPLAN	Phyla lanceolata	Lippia lanceolata	Northern Frogfruit	4	OBL	OBL	-2	Forb	Perennial	Native
PHYVIR	Physostegia virginiana	Physostegia virginiana	Obedient-Plant	4	FACW	FACW	-1	Forb	Perennial	Native
PHYAME	Phytolacca americana	Phytolacca americana	American Pokeweed	0	FACU	FACU	1	Forb	Perennial	Native
POAPRA	Poa pratensis	POA PRATENSIS	Kentucky Blue Grass	0	FAC	FACU	0	Grass	Perennial	Adventive
POLTEN	Polygonum tenue	Polygonum tenue	Slender Knotweed	5	UPL	UPL	2	Forb	Annual	Native
POTIND	Potentilla indica	DUCHESNEA INDICA	Indian-Strawberry	0	FACU	FACU	1	Forb	Perennial	Adventive
PROPAL	Proserpinaca palustris	Proserpinaca palustris	Marsh Mermaidweed	6	OBL	OBL	-2	Forb	Perennial	Native
PRUVUV	Prunella vulgaris ssp. vulgaris	PRUNELLA VULGARIS	Common Selfheal	0	FAC	FAC	0	Forb	Perennial	Adventive
PYCVIR	Pycnanthemum virginianum	Pycnanthemum virginianum	Virginia Mountain-Mint	5	FACW	FACW	-1	Forb	Perennial	Native
RATPIN	Ratibida pinnata	Ratibida pinnata	Yellow Coneflower	4	UPL	UPL	2	Forb	Perennial	Native
rhycat	Rhynchospora capitellata	Rhynchospora capitellata	Brownish Beak Sedge	8	OBL	OBL	-2	Sedge	Perennial	Native
ROSCAR	Rosa carolina	Rosa carolina	Carolina Rose	5	FACU	FACU	1	Shrub	Perennial	Native
ROSMUL	Rosa multiflora	ROSA MULTIFLORA	Rambler Rose	0	FACU	FACU	1	Shrub	Perennial	Adventive
ROSSET	Rosa setigera	Rosa setigera var. tomentosa	Climbing Rose	5	FACU	FACU	1	Shrub	Perennial	Native
RUBOCC	Rubus occidentalis	Rubus occidentalis	Black Raspberry	0	UPL	UPL	2	Shrub	Perennial	Native
RUDHIR	Rudbeckia hirta	Rudbeckia hirta var. pulcherrima	Black-Eyed-Susan	1	FACU	FACU	1	Forb	Perennial	Native
RUDSUB	Rudbeckia subtomentosa	Rudbeckia subtomentosa	Sweet Coneflower	8	FACU	FACU	1	Forb	Perennial	Native
SAGCUN	Sagittaria cuneata	Sagittaria cuneata	Arum-Leaf Arrowhead	7	OBL	OBL	-2	Forb	Perennial	Native

SAGLAT	Sagittaria latifolia	Sagittaria latifolia	Duck-Potato	3 OBL	OBL	-2 Forb	Perennial	Native
SALDIS	Salix discolor	Salix discolor	Pussy Willow	3 FACW	FACW	-1 Shrub	Perennial	Native
SALINT	Salix interior	Salix interior	Sandbar Willow	2 FACW	FACW	-1 Shrub	Perennial	Native
SALNIG	Salix nigra	Salix nigra	Black Willow	5 OBL	OBL	-2 Tree	Perennial	Native
SAMNIG	Sambucus nigra ssp. nigra	SAMBUCUS NIGRA	Black Elder	0 FAC	FACW	-1 Shrub	Perennial	Adventive
SCHSCO	Schizachyrium scoparium	Andropogon scoparius	Little False Bluestem	5 FACU	FACU	1 Grass	Perennial	Native
SCIFLU	Schoenoplectus fluviatilis	Scirpus fluviatilis; Bolboschoenus fluviatilis	River Club-Rush	4 OBL	OBL	-2 Sedge	Perennial	Native
SCHTAB	Schoenoplectus tabernaemontani	Scirpus validus creber	Soft-Stem Club-Rush	3 OBL	OBL	-2 Sedge	Perennial	Native
SCIATV	Scirpus atrovirens	Scirpus atrovirens	Dark-Green Bulrush	4 OBL	OBL	-2 Sedge	Perennial	Native
SCICYP	Scirpus cyperinus	Scirpus cyperinus	Cottongrass Bulrush	6 OBL	OBL	-2 Sedge	Perennial	Native
SCIPEN	Scirpus pendulus	Scirpus pendulus	Rufous Bulrush	2 OBL	OBL	-2 Sedge	Perennial	Native
SCULAT	Scutellaria lateriflora	Scutellaria lateriflora	Mad Dog Skullcap	4 OBL	OBL	-2 Forb	Perennial	Native
EREHIE	Senecio hieraciifolius	Erechtites hieracifolia	American Burnweed	0 FAC	FACU	0 Forb	Annual	Native
SETFAB	Setaria faberi	SETARIA FABERI	Japanese Bristle Grass	0 FACU	FACU	1 Grass	Annual	Adventive
SETVIR	Setaria viridis	SETARIA VIRIDIS	Green Foxtail	0 UPL	UPL	2 Grass	Annual	Adventive
SILINT	Silphium integrifolium	Silphium integrifolium var. deamii; Silphium integrifolium var. neglectum	Entire-Leaf Rosinweed	5 UPL	FAC	2 Forb	Perennial	Native
SILLAC	Silphium laciniatum	Silphium laciniatum	Compass-Plant	5 UPL	UPL	2 Forb	Perennial	Native
SILPER	Silphium perfoliatum	Silphium perfoliatum	Cup-Plant	5 FACW	FACW	-1 Forb	Perennial	Native
SILTER	Silphium terebinthinaceum	Silphium terebinthinaceum	Prairie Dock	5 FAC	FAC	0 Forb	Perennial	Native
SIUSUA	Sium suave	Sium suave	Hemlock Water-Parsnip	7 OBL	OBL	-2 Forb	Perennial	Native
SOLCAR	Solanum carolinense	SOLANUM CAROLINENSE	Carolina Horse-Nettle	0 FACU	FACU	1 Forb	Perennial	Adventive
SOLALT	Solidago altissima	Solidago altissima	Tall Goldenrod	1 FACU	FACU	1 Forb	Perennial	Native
SOLCAN	Solidago canadensis	Solidago canadensis	Canadian Goldenrod	1 FACU	FACU	1 Forb	Perennial	Native
SOLNEM	Solidago nemoralis	Solidago nemoralis	Gray Goldenrod	3 UPL	UPL	2 Forb	Perennial	Native
SOLRID	Solidago riddellii	Oligoneuron riddellii	Riddell's Goldenrod	8 OBL	OBL	-2 Forb	Perennial	Native
SORNUT	Sorghastrum nutans	Sorghastrum nutans	Yellow Indian Grass	5 FACU	FACU	1 Grass	Perennial	Native
SPAAME	Sparganium americanum	Sparganium americanum	American Burr-Reed	10 OBL	OBL	-2 Forb	Perennial	Native
SPAPEC	Spartina pectinata	Spartina pectinata	Freshwater Cord Grass	4 FACW	FACW	-1 Grass	Perennial	Native
SPIMAG	Spiranthes magnicamporum	Spiranthes magnicamporum	Great Plains Ladies'-Tresses	8 FAC	FACU	0 Forb	Perennial	Native
SPOHET	Sporobolus heterolepis	Sporobolus heterolepis	Prairie Dropseed	10 FACU	FACU	1 Grass	Perennial	Native
STAPAL	Stachys palustris	0	Woundwort	0 OBL	OBL	-2 Forb	Perennial	Adventive
SYMERI	Symphyotrichum ericoides	Aster ericoides	White Heath American-Aster	6 FACU	FACU	1 Forb	Perennial	Native
SYMLAN	Symphyotrichum lanceolatum	Aster simplex	White Panicled American-Aster	3 FAC	FACW	0 Forb	Perennial	Native
SYMNOV	Symphyotrichum novae-angliae	Aster novae-angliae	New England American-Aster	3 FACW	FACW	-1 Forb	Perennial	Native
SYMPIL	Symphyotrichum pilosum	Aster pilosus	White Oldfield American-Aster	0 FACU	FACU	1 Forb	Perennial	Native
SYMPUN	Symphyotrichum puniceum	Aster puniceus; Aster puniceus firmus	Purple-Stem American-Aster	8 OBL	OBL	-2 Forb	Perennial	Native
TEUCAN	Teucrium canadense	Teucrium canadense	American Germander	3 FACW	FACW	-1 Forb	Perennial	Native
TOXRAD	Toxicodendron radicans	Rhus radicans	Eastern Poison-Ivy	2 FAC	FAC	0 Vine	Perennial	Native

TRIHYB	Trifolium hybridum	TRIFOLIUM HYBRIDUM	Alsike Clover	0	FACU	FACU	1	Forb	Perennial	Adventive
typlat	Typha latifolia	Typha latifolia	Broad-Leaf Cat-Tail	5	OBL	OBL	-2	Forb	Perennial	Native
TYPGLA	Typha X glauca	TYPHA X GLAUCA	Hybrid Cat-Tail	0	OBL	OBL	-2	Forb	Perennial	Adventive
ULMRUB	Ulmus rubra	Ulmus rubra	Slippery Elm	4	FAC	FAC	0	Tree	Perennial	Native
VERHAS	Verbena hastata	Verbena hastata	Simpler's-Joy	4	FACW	FACW	-1	Forb	Perennial	Native
VERURT	Verbena urticifolia	Verbena urticifolia var. leiocarpa	White Vervain	2	FAC	FAC	0	Forb	Perennial	Native
VERALT	Verbesina alternifolia	Actinomeris alternifolia	Wingstem	5	FACW	FACW	-1	Forb	Perennial	Native
VERFAS	Vernonia fasciculata	Vernonia fasciculata	Prairie Ironweed	8	FACW	FACW	-1	Forb	Perennial	Native
VERVIR	Veronicastrum virginicum	Veronicastrum virginicum	Culver's-Root	8	FAC	FAC	0	Forb	Perennial	Native
VIOSOR	Viola sororia	Viola priceana	Hooded Blue Violet	3	FAC	FAC	0	Forb	Perennial	Native
VITRIP	Vitis riparia	Vitis riparia var. syrticola	River-Bank Grape	1	FACW	FAC	-1	Vine	Perennial	Native
XANSTR	Xanthium strumarium	Xanthium strumarium var. glabratum	Rough Cockleburr	0	FAC	FAC	0	Forb	Annual	Native
ZIZAUR	Zizia aurea	Zizia aurea	Golden Alexanders	5	FAC	FAC	0	Forb	Perennial	Native

SITE: Site C

CONSERVATISM-BASED METRICS		ADDITIONAL METRICS	
MEAN C (NATIVE SPECIES)	3.35	SPECIES RICHNESS (ALL)	85
MEAN C (ALL SPECIES)	2.45	SPECIES RICHNESS (NATIVE)	62
MEAN C (NATIVE TREES)	2.29	% NON-NATIVE	0.27
MEAN C (NATIVE SHRUBS)	2.00	WET INDICATOR (ALL)	0.22
MEAN C (NATIVE HERBACEOUS)	3.73	WET INDICATOR (NATIVE)	0.10
FQAI (NATIVE SPECIES)	26.42	% HYDROPHYTE (MIDWEST)	0.52
FQAI (ALL SPECIES)	22.56	% NATIVE PERENNIAL	0.68
ADJUSTED FQAI	28.65	% NATIVE ANNUAL	0.02
% C VALUE 0	0.39	% ANNUAL	0.02
% C VALUE 1-3	0.25	% PERENNIAL	0.91
% C VALUE 4-6	0.27		
% C VALUE 7-10	0.09		

SPECIES ACRONYM	SPECIES NAME (NWPL/ MOHLENBROCK)	SPECIES (SYNONYM)	COMMON NAME	C VALUE	MIDWEST WET INDICATOR	NC-NE WET INDICATOR	WET INDICATOR (NUMERIC)	HABIT	DURATION	NATIVITY
ACESAI	Acer saccharinum	Acer saccharinum	Silver Maple	1	FACW	FACW	-1	Tree	Perennial	Native
ACHMIL	Achillea millefolium	ACHILLEA MILLEFOLIUM	Common Yarrow	0	FACU	FACU	1	Forb	Perennial	Adventive
AGEALT	Ageratina altissima	Eupatorium rugosum	White Snakeroot	3	FACU	FACU	1	Forb	Perennial	Native
AGRPAR	Agrimonia parviflora	Agrimonia parviflora	Harvestlice	4	FACW	FAC	-1	Forb	Perennial	Native
ANDGER	Andropogon gerardii	Andropogon gerardii	Big Bluestem	5	FAC	FACU	0	Grass	Perennial	Native
ANEVIR	Anemone virginiana	Anemone virginiana	Tall Thimbleweed	5	FACU	FACU	1	Forb	Perennial	Native
CONSEP	Calystegia sepium	Convolvulus sepium	Hedge False Bindweed	1	FAC	FAC	0	Forb	Perennial	Native
CXBLAN	Carex blanda	Carex blanda	Eastern Woodland Sedge	1	FAC	FAC	0	Sedge	Perennial	Native
cxstra	Carex straminea	Carex straminea	Eastern Straw Sedge	10	OBL	OBL	-2	Sedge	Perennial	Native
CHAFAS	Chamaecrista fasciculata	Cassia fasciculata; Cassia fasciculata var. robusta	Sleepingplant	4	FACU	FACU	1	Forb	Annual	Native
CIRCAN	Circaea canadensis	Circaea lutetiana canadensis	Broad-Leaf Enchanter's-Nightshade	3	FACU	FACU	1	Forb	Perennial	Native
cirarv	Cirsium arvense	CIRSIUM ARVENSE	Canadian Thistle	0	FACU	FACU	1	Forb	Perennial	Adventive
CIRVUL	Cirsium vulgare	CIRSIUM VULGARE	Bull Thistle	0	FACU	FACU	1	Forb	Biennial	Adventive
CORRAC	Cornus racemosa	Cornus racemosa	Gray Dogwood	1	FAC	FAC	0	Shrub	Perennial	Native
CRYCAN	Cryptotaenia canadensis	Cryptotaenia canadensis	Canadian Honewort	4	FAC	FAC	0	Forb	Perennial	Native
desill	Desmodium illinoense	Desmodium illinoense	Illinois Tick-Trefoil	9	UPL	UPL	2	Forb	Perennial	Native
DIPFUL	Dipsacus fullonum	DIPSACUS SYLVESTRIS	Fuller's Teasel	0	FACU	FACU	1	Forb	Biennial	Adventive
ELAUMB	Elaeagnus umbellata	ELAEAGNUS UMBELLATA	Autumn-Olive	0	UPL	UPL	2	Shrub	Perennial	Adventive
equhye	Equisetum hyemale	Equisetum hyemale	Tall Scouring-Rush	1	FACW	FAC	-1	Fern	Perennial	Native
ERIANN	Erigeron annuus	Erigeron annuus	Eastern Daisy Fleabane	0	FACU	FACU	1	Forb	Biennial	Native
EUPALT	Eupatorium altissimum	Eupatorium altissimum	Tall Boneset	0	UPL	UPL	2	Forb	Perennial	Native
eupper	Eupatorium perfoliatum	Eupatorium perfoliatum	Common Boneset	4	OBL	FACW	-2	Forb	Perennial	Native

FRAALN	Frangula alnus	RHAMNUS FRANGULA	Glossy False Buckthorn	0	FACW	FAC	-1	Shrub	Perennial	Adventive
FRAPEN	Fraxinus pennsylvanica	Fraxinus pennsylvanica subintegerrima; Fraxinus lanceolata	Green Ash	4	FACW	FACW	-1	Tree	Perennial	Native
GALAPA	Galium aparine	Galium spurium	Sticky-Willy	0	FACU	FACU	1	Forb	Annual	Native
GEULAC	Geum laciniatum	Geum laciniatum	Rough Avens	3	FACW	FACW	-1	Forb	Perennial	Native
geuver	Geum vernum	Geum vernum	Spring Avens	3	FACU	FACU	1	Forb	Perennial	Native
HELDIV	Helianthus divaricatus	Helianthus divaricatus	Woodland Sunflower	5	UPL	UPL	2	Forb	Perennial	Native
HORJUB	Hordeum jubatum	HORDEUM JUBATUM	Fox-Tail Barley	0	FAC	FAC	0	Grass	Perennial	Native
HYPPER	Hypericum perforatum	HYPERICUM PERFORATUM	Common St. John's-Wort	0	FACU	UPL	1	Forb	Perennial	Adventive
HYPSPH	Hypericum sphaerocarpum	Hypericum sphaerocarpum	Round-Seed St. John's-Wort	7	FACU	FACU	1	Forb	Perennial	Native
JUNDUD	Juncus dudleyi	Juncus dudleyi	Dudley's Rush	2	FACW	FACW	-1	Forb	Perennial	Native
JUNEFF	Juncus effusus ssp. solutus	Juncus effusus	Lamp Rush	5	OBL	OBL	-2	Forb	Perennial	Native
JUNTEN	Juncus tenuis	Juncus tenuis	Lesser Poverty Rush	0	FAC	FAC	0	Forb	Perennial	Native
JUNTOR	Juncus torreyi	Juncus torreyi	Torrey's Rush	2	FACW	FACW	-1	Forb	Perennial	Native
JUNVIR	Juniperus virginiana	Juniperus virginiana crebra	Eastern Red-Cedar	0	FACU	FACU	1	Tree	Perennial	Native
LACSER	Lactuca serriola	LACTUCA SERRIOLA	Prickly Lettuce	0	FACU	FACU	1	Forb	Biennial	Adventive
LATPAL	Lathyrus palustris	Lathyrus palustris myrtifolius	Marsh Vetchling	7	FACW	FACW	-1	Forb	Perennial	Native
lobspi	Lobelia spicata	Lobelia spicata	Pale-Spike Lobelia	4	FAC	FAC	0	Forb	Perennial	Native
LONMAA	Lonicera maackii	LONICERA MAACKII	Amur Honeysuckle	0	UPL	UPL	2	Shrub	Perennial	Adventive
LONTAT	Lonicera tatarica	LONICERA TATARICA	Twinsisters	0	FACU	FACU	1	Shrub	Perennial	Adventive
LOTCOR	Lotus corniculatus	LOTUS CORNICULATUS	Garden Bird's-Foot-Trefoil	0	FACU	FACU	1	Forb	Perennial	Adventive
LYCAME	Lycopus americanus	Lycopus americanus	Cut-Leaf Water-Horehound	4	OBL	OBL	-2	Forb	Perennial	Native
LYTSAL	Lythrum salicaria	LYTHRUM SALICARIA	Purple Loosestrife	0	OBL	OBL	-2	Forb	Perennial	Adventive
MELALB	Melilotus albus	MELILOTUS ALBA	White Sweet-Clover	0	UPL	UPL	2	Forb	Biennial	Adventive
MONFIS	Monarda fistulosa	Monarda fistulosa	Oswego-Tea	4	FACU	FACU	1	Forb	Perennial	Native
MORALB	Morus alba	MORUS ALBA VAR. TATARICA	White Mulberry	0	FAC	FACU	0	Tree	Perennial	Adventive
OENBIE	Oenothera biennis	Oenothera biennis	King's-Cureall	0	FACU	FACU	1	Forb	Biennial	Native
ONOSEN	Onoclea sensibilis	Onoclea sensibilis	Sensitive Fern	5	FACW	FACW	-1	Fern	Perennial	Native
oxastr	Oxalis stricta	Oxalis europaea	Upright Yellow Wood-Sorrel	0	FACU	FACU	1	Forb	Perennial	Native
PARINS	Parthenocissus inserta	Parthenocissus inserta	Thicket-Creeper	0	FACU	FACU	1	Vine	Perennial	Native
PARQUI	Parthenocissus quinquefolia	Parthenocissus quinquefolia	Virginia-Creeper	4	FACU	FACU	1	Vine	Perennial	Native
PENDIG	Penstemon digitalis	Penstemon digitalis	Foxglove Beardtongue	4	FAC	FAC	0	Forb	Perennial	Native
PHAARU	Phalaris arundinacea	PHALARIS ARUNDINACEA	Reed Canary Grass	0	FACW	FACW	-1	Grass	Perennial	Adventive
PHRAUSU	Phragmites australis ssp. australis	PHRAGMITES AUSTRALIS	Common Reed	0	FACW	FACW	-1	Grass	Perennial	Adventive
phyvir	Physostegia virginiana	Physostegia virginiana	Obedient-Plant	4	FACW	FACW	-1	Forb	Perennial	Native
poacom	Poa compressa	POA COMPRESSA	Flat-Stem Blue Grass	0	FACU	FACU	1	Grass	Perennial	Adventive
poapas	Poa palustris	Poa palustris	Fowl Blue Grass	7	FACW	FACW	-1	Grass	Perennial	Native
POAPRA	Poa pratensis	POA PRATENSIS	Kentucky Blue Grass	0	FAC	FACU	0	Grass	Perennial	Adventive

POPDEL	Populus deltoides	Populus deltoides	Eastern Cottonwood	0	FAC	FAC	0	Tree	Perennial	Native
pycten	Pycnanthemum tenuifolium	Pycnanthemum tenuifolium	Narrow-Leaf Mountain-Mint	7	FAC	FAC	0	Forb	Perennial	Native
PYCVIR	Pycnanthemum virginianum	Pycnanthemum virginianum	Virginia Mountain-Mint	5	FACW	FACW	-1	Forb	Perennial	Native
quevel	Quercus velutina	Quercus velutina	Black Oak	5	UPL	UPL	2	Tree	Perennial	Native
RATPIN	Ratibida pinnata	Ratibida pinnata	Yellow Coneflower	4	UPL	UPL	2	Forb	Perennial	Native
RHACAT	Rhamnus cathartica	RHAMNUS CATHARTICA	European Buckthorn	0	FAC	FAC	0	Shrub	Perennial	Adventive
rhycat	Rhynchospora capitellata	Rhynchospora capitellata	Brownish Beak Sedge	8	OBL	OBL	-2	Sedge	Perennial	Native
ROSMUL	Rosa multiflora	ROSA MULTIFLORA	Rambler Rose	0	FACU	FACU	1	Shrub	Perennial	Adventive
RUBALL	Rubus allegheniensis	Rubus allegheniensis	Allegheny Blackberry	3	FACU	FACU	1	Shrub	Perennial	Native
rumace	Rumex acetosella	RUMEX ACETOSELLA	Common Sheep Sorrel	0	FACU	FACU	1	Forb	Perennial	Adventive
RUMCRI	Rumex crispus	RUMEX CRISPUS	Curly Dock	0	FAC	FAC	0	Forb	Perennial	Adventive
SALINT	Salix interior	Salix interior	Sandbar Willow	2	FACW	FACW	-1	Shrub	Perennial	Native
sasalb	Sassafras albidum	Sassafras albidum	Sassafras	3	FACU	FACU	1	Tree	Perennial	Native
SCIPEN	Scirpus pendulus	Scirpus pendulus	Rufous Bulrush	2	OBL	OBL	-2	Sedge	Perennial	Native
SILINT	Silphium integrifolium	Silphium integrifolium var. deamii; Silphium integrifolium var. neglectum	Entire-Leaf Rosinweed	5	UPL	FAC	2	Forb	Perennial	Native
SILLAC	Silphium laciniatum	Silphium laciniatum	Compass-Plant	5	UPL	UPL	2	Forb	Perennial	Native
SILTER	Silphium terebinthinaceum	Silphium terebinthinaceum	Prairie Dock	5	FAC	FAC	0	Forb	Perennial	Native
SOLCAR	Solanum carolinense	SOLANUM CAROLINENSE	Carolina Horse-Nettle	0	FACU	FACU	1	Forb	Perennial	Adventive
SOLALT	Solidago altissima	Solidago altissima	Tall Goldenrod	1	FACU	FACU	1	Forb	Perennial	Native
SOLCAN	Solidago canadensis	Solidago canadensis	Canadian Goldenrod	1	FACU	FACU	1	Forb	Perennial	Native
TOXRAD	Toxicodendron radicans	Rhus radicans	Eastern Poison-Ivy	2	FAC	FAC	0	Vine	Perennial	Native
TRAOHI	Tradescantia ohiensis	Tradescantia ohiensis	Bluejacket	3	FACU	FACU	1	Forb	Perennial	Native
ULMAME	Ulmus americana	Ulmus americana	American Elm	3	FACW	FACW	-1	Tree	Perennial	Native
VERVIR	Veronicastrum virginicum	Veronicastrum virginicum	Culver's-Root	8	FAC	FAC	0	Forb	Perennial	Native
VITRIP	Vitis riparia	Vitis riparia var. syrticola	River-Bank Grape	1	FACW	FAC	-1	Vine	Perennial	Native
ZIZAUR	Zizia aurea	Zizia aurea	Golden Alexanders	5	FAC	FAC	0	Forb	Perennial	Native

WSP USA, Inc.
High Speed Rail - Tier 8, Elwood to Braidwood
Will County, Illinois
Botanical Survey Photographic Log

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 1 Facing southwest toward Site 1 (August 13, 2024).

Photo 2 Facing northeast toward Site 1 (August 13, 2024).

Photo 3 Facing toward Site 1 (August 13, 2024).

Photo 4 Wild quinine (*Parthenium integrifolium*) found within Site 2 (August 13, 2024).

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 5 Leadplant (*Amorpha canescens*) found within Site 2 (August 13, 2024).

Photo 6 Facing north toward Site 3 (August 13, 2024).

Photo 7 Facing southwest toward Site 3 (August 13, 2024).

Photo 8 Facing west toward Site 3 (August 13, 2024).

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 9 Rough blazing star (*Liatris aspera*) found within Site 3 (August 13, 2024).

Photo 10 Winged loosestrife (*Lythrum alatum*) found within Site 5 (June 11, 2024).

Photo 11 Facing northeast toward Site 16 (August 13, 2024).

Photo 12 Facing southwest toward Site 16 (August 13, 2024).

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 13 Facing northeast toward Site 17 (August 13, 2024).

Photo 14 Facing southwest toward Site 17 (August 13, 2024).

Photo 15 Site 18 (August 13, 2024).

Photo 16 Site 18 (August 13, 2024).

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 17 Facing northeast toward Site 19 (August 13, 2024).

Photo 18 Facing southwest toward Site 19 (August 13, 2024).

Photo 19 Facing northeast toward Site 21 (August 13, 2024).

Photo 20 Early goldenrod (*Solidago juncea*) found within Site 21 (August 13, 2024).

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 21 Dense blazing star (*Liatris spicata*) found within Site 21 (August 13, 2024).

Photo 22 Facing southwest toward Site 21 and Site 22 (August 13, 2024).

Photo 23 Facing northeast toward Site 23 (August 13, 2024).

Photo 24 Facing southwest toward Site 23 (August 13, 2024).

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 25 Facing northeast toward Site 26 (August 13, 2024).

Photo 26 Facing southwest toward Site 26 (August 13, 2024).

Photo 27 Facing northwest toward Botanical Site A, located west of the High Speed Rail (HSR) corridor, from approximately 6,225 feet north of N River Road, near Mile Post (MP) 50.25 (2020).

Photo 28 Facing southwest toward BotanicalSite A, located west of the HSR corridor, from approximately 7,420 feet north of N River Road, near MP 50.1 (2020).

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 29 Facing south toward Botanical Site B, located east of the HSR corridor, from approximately 5,325 feet north of N River Road, near MP 50.5 (2020).

Photo 30 Facing south toward Botanical Site B, located east of the HSR corridor, from approximately 7,525 feet north of N River Road, near MP 50 (2020).

Photo 31 Facing east toward Botanical Site C (Hitts Siding Prairie Nature Preserve), from approximately 3,095 feet southwest of Strip Mine Road, near MP 54 (2020).

Photo 32 Facing south toward Botanical Site C, from approximately 4,275 feet southwest of Strip Mine Road, near MP 54.2 (2020).

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 33 Rattlesnake master (*Eryngium yuccifolia*) flowers (2020).

Photo 34 Rattlesnake master basal leaves (2020).

Photo 35 Queen-of-the-prairie (*Filipendula rubra*) leaf (2020).

Photo 36 Decurrent false aster (*Boltonia decurrens*) flowers (September 1, 2020).

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 37 Decurrent false aster leaves and stems (September 1, 2020).

Photo 38 Royal catchfly (*Silene regia*) flowers (2020).

APPENDIX C

Rattlesnake Master Survey Photographic Log

WSP USA, Inc.
High Speed Rail – Tier 8, Elwood to Braidwood
Will County, Illinois
Rattlesnake Master Surveys Photographic Log
July 29, August 21, September 1, 3, 25, and 26, October 10 2020

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 1 Facing northeast toward a former rattlesnake master (*Eryngium yuccifolium*) survey area located north of Walter Strawn Drive from approximately 100 feet northwest of southbound (SB) Illinois Route 53 (IL 53).

Photo 2 Facing southwest toward a former rattlesnake master survey area located north of Walter Strawn Drive from approximately 100 feet northwest of SB IL 53.

Photo 3 Facing southwest toward a former rattlesnake master survey area located south of Walter Strawn Drive from approximately 30 feet northwest of SB IL 53.

Photo 4 Facing northeast toward a former rattlesnake master survey area located south of Walter Strawn Drive from approximately 30 feet northwest of SB IL 53.

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 5 Facing southwest toward a former rattlesnake master survey area (Population B in 2014 INHS Survey) located approximately 920 feet south of Walter Strawn Drive from approximately 80 feet northwest of SB IL 53.

Photo 6 Facing southwest toward a former rattlesnake master survey area (Population B in 2014 INHS Survey) located approximately 920 feet south of Walter Strawn Drive from approximately 80 feet northwest of SB IL 53.

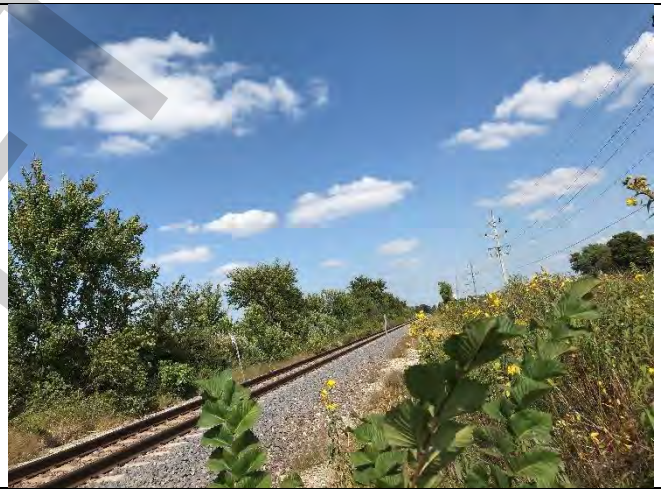

Photo 7 Facing southwest toward a former rattlesnake master survey area (Site 2, Population D in 2014 INHS Survey) located beyond the railroad tracks, approximately 420 feet south of Hoff Road from approximately 80 feet northwest of SB IL 53.

Photo 8 Facing northeast toward a former rattlesnake master survey area (Site 2, Population D in 2014 INHS Survey) located beyond the railroad tracks, approximately 420 feet south of Hoff Road from approximately 80 feet northwest of SB IL 53.

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 9 Facing southwest toward a former rattlesnake master survey area (Site 3, Population E in 2014 INHS Survey) located approximately 480 feet south of Hoff Road from approximately 40 feet northwest of SB IL 53.

Photo 10 Facing northwest toward a former rattlesnake master survey area (Site 3, Population E in 2014 INHS Survey) located approximately 480 feet south of Hoff Road from approximately 40 feet northwest of SB IL 53 (9/25/2020).

Photo 11 Facing southwest toward rattlesnake master Population F, located within the Abraham Lincoln National Cemetery.

Photo 12 Facing northeast toward Rattlesnake Master Population H, located within the Abraham Lincoln National Cemetery.

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 13 Facing northeast toward a rattlesnake master survey area (Population A) located approximately 5,280 feet north of River Road from approximately 1,230 feet west of SB IL 53.

Photo 14 Facing southwest toward a rattlesnake master survey area (Population A) located approximately 5,280 feet north of River Road from approximately 1,230 feet west of SB IL 53.

Photo 15 Facing northwest toward a rattlesnake master survey area (Population B) located approximately 5,280 feet north of River Road from approximately 840 feet west of SB IL 53.

Photo 16 Facing south toward a rattlesnake master survey area (Population B) located approximately 5,280 feet north of River Road from approximately 840 feet west of SB IL 53.

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 17 Facing northeast toward a rattlesnake master survey area (Population C) located within the Hitts Siding Prairie Nature Preserve.

Photo 18 Facing northeast toward a rattlesnake master survey area (Population C) located within the Hitts Siding Prairie Nature Preserve.

Photo 19 Facing west toward a former rattlesnake master survey area (Site 16 in 2013 INHS Survey) located east of the railroad line approximately 960 feet southwest of Stripmine Road.

Photo 20 Facing northwest toward a former rattlesnake master survey area (Site 17 in 2013 INHS Survey) located east of the railroad line approximately 1,370 feet southwest of Stripmine Road.

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 21 Facing southwest toward a former rattlesnake master survey area (Site 18 in 2013 INHS Survey) located west of the railroad line approximately 1,990 feet southwest of Stripmine Road.

Photo 22 Facing northwest toward a former rattlesnake master survey area (Site 19 in 2013 INHS Survey) located east of the railroad line approximately 2,895 feet southwest of Stripmine Road.

Photo 23 Facing north toward a former rattlesnake master survey area (Site 20 in 2013 INHS Survey) located east of the railroad line approximately 4,010 feet southwest of Stripmine Road.

Photo 24 Facing northwest toward a former rattlesnake master survey area (Site 21 in 2013 INHS Survey) located east of the railroad line 4,435 feet southwest of Stripmine Road.

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 25 Facing north toward a former rattlesnake master survey area (Site 22 in 2013 INHS Survey) located east of the railroad line approximately 4,825 feet southwest of Stripmine Road.

Photo 26 Facing north toward a former rattlesnake master survey area (Site 23 in 2013 INHS Survey) located east of the railroad line approximately 6,300 feet southwest of Stripmine Road.

Photo 27 A representative rattlesnake borer moth (*Papaipema eryngii*) hole at Hitts Siding Prairie.

Photo 28 A representative rattlesnake borer moth hole at Hitts Siding Prairie.

APPENDIX D

Avian Survey Location Map

Avian Survey Photographic Log

Legend
- Abraham Lincoln National Cemetery
- Hitts Siding Prairie Nature Preserve
- Midewin National Tallgrass Prairie
- Des Plaines Fish & Wildlife Area
- Upland Sandpiper Habitat
- Grassland Bird Habitat
- Mileposts
- Project Limits

W Noel Rd
W Pickford Ave
45
S Diagonal Rd
Drummond Rd
1st
53
S Tehle Rd
S Chicago Rd
W Brown Rd
46
W Hoff Rd
47
S Coldwater Rd
Gurney Rd
Joliet Arsenal
Town Line Rd
48
Doyle Rd
49
Coldwater Rd
50
S 53
N River Rd
New River Rd
51
S Quigley Rd
W Quigley Rd
W K3 Dr
S Riley Rd
Amber Ln
Widows Rd
55
E Frontage Rd
N Kankakee St
52
Peotone Rd
W Peotone Rd
Stevens Ln
53
Davy Ln
Mill St
Cr Rd
W Allot Rd
Frontage Rd
Strp Mine Rd
Stripmine Rd
54
S 129
S 1st St
S Park St
S Water St
Luther Dr
S Barr Rd
W 5th Rd
Sunset Dr
Janet Dr
S Butcher Ln
N Harbor Ct
W Coal City Rd
55
Nowy Rd
Roberts St
Zilm Rd
56
Cedar Ln
N Division St
N School St
N Center St
N B St
N Washington St
57
Outer Dr
Circle Dr
Shenk Rd
W 1st St
W Main St
E Main St
113
W Kennedy Rd
58
S Center St
Cemetery Dr
S Front St
Essex Rd
59
W Smiley Rd

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Huff & Huff, Inc.

Figure 3A
Elwood to Braidwood Track Key Sheet
Construction Project (Tier 8)
Avian Survey Site Location Map
Will County, Illinois

Aerial Source: USDA FSA 2012 NAIP MrSID Mosaic 2012
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Legend
- Abraham Lincoln National Cemetery
- Hitts Siding Prairie Nature Preserve
- Midewin National Tallgrass Prairie
- Des Plaines Fish & Wildlife Area
- Upland Sandpiper Habitat
- Grassland Bird Habitat
- Mileposts
- Project Limits

Arsenal Rd
W Pickford Ave
S Patterson Rd
45
S Diagonal Rd
N Chicago St
Baseline St
Mississippi St
W Mississippi Rd
Mississippi Ave
46
W South St
S Old Wilmington Rd
S Coldwater Rd
W Hoff Rd
Gurney Rd
47
Joliet Arsenal
Town Line Rd
48
Coldwater Rd
Doyle Rd
49
50
S 53
N River Rd
New River Rd
51
S Quigley Rd
W Quigley Rd
W K3 Dr
S Riley Rd
Amber Ln
Widows Rd
N Kankakee St
52
Peotone Rd
W Peotone Rd
S Smith Rd
Stevens Ln
N 1st St
Mill St
53
Cr Rd
S 216th Ave
W Allot Rd
Stripmine Rd
S 1st S
S Park St
S K3 St
S Water St
Pearl St
Luther Dr
S Barr Rd
54
Lawhorn Ln
Kristin Ln
W 5th Rd
Vista Dr
Sunset Dr
Janet Dr
S Butcher Ln
S 129
W Coal City Rd
55
Roberts St
E John St
School Dr
Zilm Rd

0 2,000 4,000
Feet

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W E
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Huff & Huff, Inc.

Figure 3B
Elwood to Braidwood Track
Construction Project (Tier 8)
Avian Survey Site Location Map
Will County, Illinois

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WSP USA, Inc.
High Speed Rail – Tier 8, Elwood to Braidwood
Will County, Illinois
Avian Surveys Photographic Log
June 29th through October 10th, 2020

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 1 Facing an area of designated, potential habitat for the loggerhead shrike (*Lanius ludovicianus*) and upland sandpiper (*Bartramia longicauda*) located within Midewin Tallgrass Prairie.

Photo 2 Facing an area of designated, potential habitat for the loggerhead shrike and upland sandpiper located within Midewin Tallgrass Prairie.

Photo 3 Facing an area of designated, potential habitat for the loggerhead shrike and upland sandpiper located within Midewin Tallgrass Prairie.

Photo 4 Facing an area of designated, potential habitat for the loggerhead shrike and upland sandpiper located within Midewin Tallgrass Prairie.

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 5 Facing an area of designated, potential habitat for the loggerhead shrike and upland sandpiper located within Midewin Tallgrass Prairie.

Photo 6 Facing an area of designated, potential habitat for the loggerhead shrike and upland sandpiper located within Midewin Tallgrass Prairie.

Photo 7 Facing an area of designated, potential habitat for the loggerhead shrike and upland sandpiper located within the Abraham Lincoln National Cemetery.

Photo 8 Facing an area of designated, potential habitat for the loggerhead shrike and upland sandpiper located within the Abraham Lincoln National Cemetery.

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 9 Facing an area of designated, potential habitat for the loggerhead shrike and upland sandpiper located within the Abraham Lincoln National Cemetery.

Photo 10 Facing an area of designated, potential habitat for the loggerhead shrike and upland sandpiper located within the Hitt's Siding Nature Preserve.

Photo 11 Facing an area of designated, potential habitat for the loggerhead shrike and upland sandpiper located within the Hitt's Siding Nature Preserve.

Photo 12 Facing an area of designated, potential habitat for the loggerhead shrike and upland sandpiper located within the Hitt's Siding Nature Preserve.

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 13 Facing an area of designated, potential habitat for the loggerhead shrike and upland sandpiper located within the Hitt's Siding Nature Preserve.

Photo 14 Facing an area of designated, potential habitat for the loggerhead shrike and upland sandpiper located within the Hitt's Siding Nature Preserve.

APPENDIX E

Turtle Survey Location Map

Turtle Survey Photographic Log

WSP USA, Inc.
High Speed Rail - Tier 8, Elwood to Braidwood
Will County, Illinois
Herpetofauna Surveys Photographic Log
September 14th through September 19th 2020

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 1 A representative small turtle trap with bait to survey for Blanding's turtles (*Emydoidea blandingii*).

Photo 2 A representative trap, partially submerged to capture turtles.

Photo 3 A representative large turtle trap, partially submerged to capture turtles.

Photo 4 Representative pond habitat in which trapping took place.

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 5 A successful trap with several painted turtle (*Chrysemys picta*) individuals.

Photo 6 GZA staff measuring a painted turtle specimen before releasing it.

Photo 7 A snapping turtle (*Chelydra serpentina*) in a turtle trap.

Photo 8 Facing north toward potential Blanding's turtle habitat located within Hitts Siding Prairie Nature Preserve, adjacent to an ornate box turtle (*Terrapene ornata*) meander survey transect

WSP USA, Inc.
High Speed Rail - Tier 8, Elwood to Braidwood
Will County, Illinois
Herpetofauna Surveys Photographic Log
September 14th through September 19th 2020

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 9 Representative habitat surveyed for the ornate box turtle. Photo taken at Midewin National Tallgrass Prairie.

Photo 10 Representative mesic prairie habitat surveyed for the ornate box turtle. Photo taken within Hitts Siding Prairie Nature Preserve.

Photo 11 Representative habitat surveyed for the ornate box turtle. Photo taken at Hitts Siding Prairie Nature Preserve.

Photo 12 An eastern garter snake (*Thamnophis sirtalis*) encountered during visual meander surveys.

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 13 A six-lined racerunner (*Aspidoscelis sexlineatus*) encountered duirng visual meander surveys.

Photo 14 A relict turtle shell from an unknown species encountered during visual meander surveys.

Photo 15 A relict turtle shell from an unknown species encountered during visual meander surveys.

APPENDIX F

Rusty Patched Bumble Bee Habitat Assessment

Rusty Patched Bumble Bee Survey Map

Rusty Patched Bumble Bee Survey Photographic Log

Rusty Patched Bumble Bee Identification Summary

Huff & Huff incorporated
A Subsidiary of GZA

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION MANAGEMENT

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www.huffnhuff.com
www.gza.com

February 27, 2025

Mr. Tim Selover
WSP USA, Inc.
30 North LaSalle Street, Suite 4200
Chicago, IL 60602

Re: Rusty Patch Bumble Bee Habitat Assessment Memo
Elwood to Braidwood Track Construction Project
(Mainline of the Union Pacific Railroad [UPRR] from MP 44.60 to MP 55.50)
Will County, Illinois

Dear Mr. Selover:

Huff & Huff, Inc. (H&H) staff biologists conducted habitat assessments for the federally endangered rusty patched bumble bee (*Bombus affinis*; RPBB) for the above referenced project, located within Will County, Illinois (T33N, R9E, Sections 1 and 12, and T33N, R10E, Sections 6, 7, and 31).

As a part of the corridor studies for the Union Pacific Railroad (UPRR) High Speed Intercity Passenger Rail Tier 8 Double Tracking Project, H&H conducted habitat assessments to characterize the potential presence and quality of suitable foraging, nesting, and overwintering habitats for the RPBB located within High Potential Zones (HPZ) within the project limits. Approximately 1.3 miles (36 acres) of the project corridor lies within an HPZ for RPBB (USFWS, 2024), as shown on Figure 6, attached with this memo. The area of interest for the RPBB habitat assessment is located approximately one mile southwest of the Illinois Route 53 (IL 53) and Hoff Road intersection and continues south to approximately 1.7 miles north of Arsenal Road. Data collected by H&H during field surveys in 2020 and 2024 was used to complete the habitat assessment.

A photographic survey for RPBB was completed in 2020 following a meeting with USFWS. As a result of a follow up meeting on December 6, 2024, additional habitat detail is included in this memorandum. Please refer to Section 2.5 of the 2024 Natural Resources Update Report for information regarding the life history and habitat of the RPBB as well as results of the RPBB surveys conducted in 2020.

METHODOLOGIES

The habitat assessment used data collected previously to assess habitat using the methodologies presented in the *Rusty Patched Bumble Bee Habitat Assessment Form & Guide* (Xerces Society, 2017), *Project-Specific Bumble Bee Habitat Quality Assessment* protocols developed by Jason Robinson of the Illinois Natural History Survey (INHS) (Robinson, 2024).

The habitat assessments help identify the potential presence and quality of suitable habitat for the RPBB within the HPZ within the project limits. On-site surveys for the RPBB are typically conducted during the summer months when RPBB are most active (late June through September; USFWS, 2024). H&H conducted RPBB species surveys in July and August of 2020.

Habitat requirements for the RPBB are divided into four categories (elements): spring foraging habitat, summer foraging habitat, nesting habitat, and overwintering habitat, as outlined in Table 1 (Robinson, 2024). Ideal conditions for the RPBB contain all four habitat elements.

Table 1. Habitat Elements of Rusty Patch Bumble Bees

Habitat Element	Description
Spring Resources	Floral resources that develop to bloom during periods when queens are foraging for nest building materials or rearing small batches of workers, i.e. when queens are the primary individual bumble bees active in the landscape.
Summer Resources	Floral resources that provide nectar and/or pollen to bumble bees during the period of maximum bumble bee worker abundance, including preferred "superfood" or "immune system" forage species that provide elevated nutritional value to bumble bees (e.g. *Monarda fistulosa*, *Eutrochium* spp., *Echinacea purpurea*, *Cirsium* spp., *Amorpha canescens*, *Impatiens* sp., *Helianthus* spp., *Chelone* spp., *Penstemon* spp.).
Nesting Resources	Soil voids, rodent burrows, bunch grasses, soil fissures, tree holes, debris piles, flowerpots and many other similar areas can provide enough sheltered refuge to allow bumble bees to create combs and rear larvae to adult worker and reproductive stages.
Overwintering Resources	Areas with substrates suitable for the survival of overwintering mated queens. These may include mulch piles, thick leaf litter, bunch grasses, or other structures (including bare soil near the natal colony site).
No habitat	Areas of open water, road surfaces, parking lots, building footprints and other impervious surfaces that offer no resources for bumble bees.

Methodologies outlined by Robinson (2024) were not utilized for the field assessments. However, Robinson's protocol was utilized after-the-fact, upon completion of the field assessment, to analyze the quality and quantity of potential suitable habitat for the RPBB within the HPZ. According to Robinson (2024), when conducting a RPBB habitat assessment, specific characteristics of the landscape are documented, including flora species throughout the growing season, the presence of non-flowering flora such as bunch grasses, evidence of useful features for the RPBB such as rodent holes, and the presence of available natural and anthropogenic materials such as leaf litter and mulch piles. When taking all four elements of the site into consideration, a quantitative evaluation of the quality of habitat can be established.

As part of the field assessment, GIS survey data is collected as polygons around each element present within the survey area. Polygons delineating occurrences and numbers of every element encountered were not collected during field assessments in 2024; however, the assessment of potential RPBB habitat within the HPZ in the project limits followed Robinson's methodologies to the extent practical.

The methodology calls for the polygons collected during the field assessments to be used to quantify the total number of elements present and the quality of the habitat, taking the entire life cycle of RPBB into consideration. The site is then analyzed, and areas can be designated as Low, Medium, or High Quality habitat or No Habitat. Areas with no elements present are considered No Habitat; areas with one element present are considered Low Quality; areas with two or three elements are considered Medium Quality; and areas with all four elements present are considered High Quality habitat for the RPBB.

As part of the field assessments for the RPBB, floristic quality assessments were also completed. Observed plant species were noted to obtain the Floristic Quality Index (FQI) and native mean C-value (coefficient of conservatism). Areas of high natural quality include native plants with C- values ranging from approximately 4 to 10. C-values are assigned to native plants as listed in *Flora of the Chicago Region* (Wilhelm and Rericha, 2017). A low C-value indicates that a plant is generally not considered high quality or is a habitat generalist. A native species FQI for each site is obtained by multiplying mean C-value of all native plants encountered in a quadrat by the square root of the number (N) of native species. Native species FQI values of 0 to 5.0 are considered severely degraded, 5.1 to 9.9 as degraded, 10 to 19.9 are moderate quality with some native character, and those with values greater than 20 have natural characteristics and are considered an environmental asset.

Upon completion of the field assessment, data collected is used to analyze the site for RPBB habitat using guidelines outlined by Robinson as well as the *Rusty Patched Bumble Bee Habitat Assessment Form & Guide.*

The *Rusty Patched Bumble Bee Habitat Assessment Form & Guide* (Guide) was developed to provide education and guidance to landowners and land managers to prioritize conservation actions and quantify habitat or land management improvements for the RPBB on a single Site[1]. Scoring goals for a single Site outlined within the Guide were developed with the purpose of assessing sites where the RPBB has been detected, but can also be used to measure conservation goals for a single Site. The Guide allows the user to assess site conditions through the analysis of five 'sections'. For each section, several questions are posed to characterize the Site. Each possible answer and section are given a maximum numerical value, and a cumulative score is calculated as the sum of all sections. The sections and their maximum scores are as follows:

Section 1: Regional and Landscape Features (20)
Section 2: Site Features (35)
Section 3: Foraging Habitat (50)
Section 4: Nesting and Overwintering Habitat (30)
Section 5: Management and Pesticide Practices (80)
Total Maximum Score (215)

Site scoring can be used to quantify existing resources, land use and potential suitable habitat, and potential impacts to the RPBB within the Site before and after project implementation. A maximum score of 215 can be achieved when a single Site provides optimal habitat and foraging resources for the RPBB. Site scoring is intended to be conducted before (baseline) and after a project implementation (post-construction), with the intention to improve the Site score and habitat conditions for the RPBB. Landowners and managers are encouraged to strive to achieve an initial score of at least 100, and an increase of at least 40 points upon implementation and post construction management activities.

HABITAT ASSESSMENT RESULTS

Although specific surveys for the RPBB were not completed in 2024, the RPBB was not observed within the Site during the 2024 field assessment. The temperature on the date of the survey ranged between approximately 73°F to 87°F, with moderate humidity and partial to mostly cloudy. Weather conditions did not hinder the investigation.

[1] The term "Site" is used within the *Rusty Patched Bumble Bee Habitat Assessment Form & Guide*. Within this document, "Site" is defined as the project limits that are located within the HPZ.

QUANTIFICATION OF HABITAT AREAS WITHIN THE HPZ/SITE

Habitat and community types observed at the project site include: wet meadow and scrub-shrub wetlands, mesic prairies, degraded forests, and mowed trail, roadway, and railway rights-of-way. A tributary to Prairie Creek is located within the southern portion of the project limits located within the HPZ.

Within the project limits located within the HPZ, the tributary to Prairie Creek, routinely mowed medians, and impermeable surfaces such as roads, gravel road shoulders, and trails are considered No Habitat (approximately 11.9 acres; 33%). Approximately 23.2 acres (64%) are considered Low or Medium Quality habitat, providing between one and three elements of RPBB habitat. The conditions of these areas included intermittent floral resources, degraded or disturbed land, scrub/shrub and forested areas, and/or wetlands. Wetlands are not likely to be used as nesting or overwintering habitat, but may offer spring or summer foraging habitat. Approximately 0.90 acres (2%), located northwest of the Henlow Trail overpass over IL 53 are considered High Quality habitat as this area contained all four elements (spring foraging, summer foraging, nesting, and overwintering habitat). The rest of the site is estimated to be Low or Medium Quality habitat. Table 2 summarizes the area of each element within the project limits located within the HPZ.

Table 2 – RPBB Elements Summary

Element	Area (acres)	Percentage of total (%)[1]
Spring Foraging	0.9	2.5
Summer Foraging	0.9	2.5
Nesting	22.2	61.8
Overwintering	24.1	67.2
No Habitat	11.8	32.8

[1]Total area of project limits within HPZ is 36 acres.

Figure 8 depicts an estimation of the elements that are present within the project limits within the HPZ. Photographic documentation of the project limits located within the HPZ is provided in Attachment 3.

HABITAT ASSESSMENT SCORING RESULTS

Table 3 summarizes the results of the RPBB habitat assessment scoring completed in 2024 by H&H using parameters outlined within the Guide for the Site scoring. According to the site assessments completed in 2020 and 2024, the Site achieved a score of 125. This moderately high score is largely due to the diversity of plant species found within the project limits and because a large percentage of the project limits is undisturbed (not regularly mowed, grazed, or burned). Section 5b did not receive a score since management practices within the Site are unknown to H&H. The factors contributing to the score for each section are discussed in detail within Table 3. See Attachment 2 for the *Rusty Patched Bumble Bee Habitat Assessment Form & Guide* completed for this project.

Table 3 – RPBB Habitat Assessment Scoring Results Summary

Section	Factors Contributing to Score	Score
Section 1: Regional and Landscape Features[1] (Max score 20)	Mix of native, native (non-invasive), and weedy/invasive flora. Land use cover within a 5km radius of the project site is comprised of undeveloped areas associated with Midewin National Tallgrass Prairie, the Joliet Army Ammunition Plant INAI Site, the Kankakee River INAI Site, Hitt Siding Prairie Nature Preserve, Wilmington Shrub Prairie INAI Site, Wilmington West Geologic Area INAI Site, Braidwood Dunes and Savanna INAI Site, Manhattan Creek INAI Site, Munch Area INAI Site, Grant Creek Prairie Nature Preserve INAI Site, the Des Plaines Dolomite Prairie INAI Site. In addition, the following Forest Preserve District of Will County preserves are within 5km of the project site; Forked Creek Preserve, Kankakee Sands Preserve, Sand Ridge Savanna Nature Preserve, Braidwood Dunes and Savanna Nature Preserve. Undeveloped areas are also present within 5km of the project site associated with the Joliet Army Training Area, the Des Plaines River, and various vacant parcels. However, land use within 5km of the project site also consists of developed suburban areas within Wilmington and Elwood and agricultural and intermodal facility land uses, as well as Abraham Lincoln National Cemetery.	10
Section 2: Site Features (Max score 35)	Percentage of project site in natural or semi-natural habitat is approximately 25-49%; Permanent meadows and open areas, wooded areas, wetlands, and buffer areas with diverse native wildflowers allowed to bloom are present; Grassy buffers are present.	17
Section 3: Foraging Habitat (Max score 50)	Percentage of vegetative cover that is comprised of forbs, flowering shrubs, or pollinator-friendly trees (10-20%); Number of species of forbs, flowering shrubs, or pollinator-friendly trees that bloom in spring, summer, and fall (10+); Number of RPBB superfoods on site (5-8); Number of species known to build RPBB immune system (3);	41
Section 4: Nesting and Overwintering Habitat (Max score 30)	Available nesting and overwintering habitat (undisturbed native bunch grasses; loose soil with rodent holes; areas that are unmowed, ungrazed, and not burned, areas with woody cover; leaf litter on site)	17
Section 5a: Pesticide Practices (Max score 40)	Pesticide use within Site are unknown but assumed to be minimal.	40
Section 5b: Management Practices (Max score 40)	Management practices within Site are unknown.	0
TOTAL		**125**

[1] See Figure 7 in Attachment 1 for Illinois Protected Lands located within a 5 kilometer radius of the Site.

FIELD SURVEYS AND HABITAT ASSESSMENT RESULTS

Flora data was taken within the High Quality foraging area located northwest of the Henslow Trail overpass. Based on flora data collected during field assessments in 2024, the native FQI and native mean C-value are 28.0 and 4.0 respectively, indicating high floristic quality with native character. Plant species found within the High Quality area located within the HPZ that are known to be frequented by RPBB are listed in Table 4. See Attachment 4 for the Floristic Quality Assessment of the High Quality area.

Table 4 – RPBB Floral Associate Species Observed

Common Name	Scientific Name	C-Value
Alfalfa	*Medicago sativa*	0
Bull thistle	*Cirsium vulgare*	0
Canadian goldenrod	*Solidago canadensis*	1
Canadian thistle	*Cirsium arvense*	0
Carolina horse-nettle	*Solanum carolinense*	0
Cat-tail gayfeather	*Liatris pycnostachya*	8
Compass plant	*Silphium laciniatum*	5
Downy sunflower*	*Helianthus mollis*	9
Gray goldenrod	*Solidago nemoralis*	3
Indian plantain	*Arnoglossum atriplicifolium*	8
Lance-leaf tickseed	*Coreopsis lanceolata*	8
Meadow garlic	*Allium canadense*	3
Multiflora rose	*Rosa multiflora*	0
Narrow-leaf mountain-mint	*Pycnanthemum tenuifolium*	7
Ohio spiderwort	*Tradescantia ohiensis*	3
Orange coneflower	*Rudbeckia fulgida*	0
Parsnip	*Pastinaca sativa*	0
Prairie dock	*Silphium terebinthinaceum*	5
Prairie ironweed	*Vernonia fasciculata*	8
Queen Anne's lace	*Daucus carota*	0
Rattlesnake master	*Eryngium yuccifolium*	9
Red clover	*Trifolium pratense*	0
Rosinweed	*Silphium integrifolium*	5
Saw-tooth sunflower*	*Helianthus grosseserratus*	4
Tall goldenrod	*Solidago altissima*	1
Tall tickseed	*Coreopsis tripteris*	5
Twinsisters	*Lonicera tartarica*	0
Wild bergamot*	*Monarda fistulosa*	4
White vervain	*Verbena urticifolia*	2
Woodland sunflower*	*Helianthus divaricatus*	5
Yellow coneflower	*Ratibida pinnata*	4
Yellow sweet clover	*Melilotus alba*	0

*Denotes RPBB superfood or immune system species (Robinson, 2024)

CONCLUSION

Spring foraging, summer foraging, nesting, and overwintering habitat were identified within the project limits located within the HPZ. Preliminary quantification of the quality of this habitat is estimated to be Low to Medium Quality habitat for the RPBB. Approximately 0.90 acres located northwest of the Henslow Trail overpass is considered High Quality RPBB due to the presence of spring foraging, summer foraging, nesting, and overwintering habitats.

If you have questions, please contact Alycia Kluenenberg at Alycia.Kluenenberg@gza.com or 630-684-4412.

Sincerely,

Huff & Huff, Inc., a Subsidiary of
GZA GEOENVIRONMENTAL, INC.

Lindsay Hayward
Environmental Scientist

Lailah Reich, P.W.S./Arborist
Consultant Reviewer

Alycia Kluenenberg, P.W.S.
Associate Principal

Enclosures:

Attachment 1 – Figures
- Figure 6 – Project Limits within the High Potential Zone Map
- Figure 7 – Illinois Protected Lands Map
- Figure 8 – RPBB Habitat Map

Attachment 2 – Rusty Patched Bumble Bee Habitat Assessment Form & Guide
Attachment 3 – Photographic Log
Attachment 4 – Floristic Quality Assessment

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Attachment 1

Figures

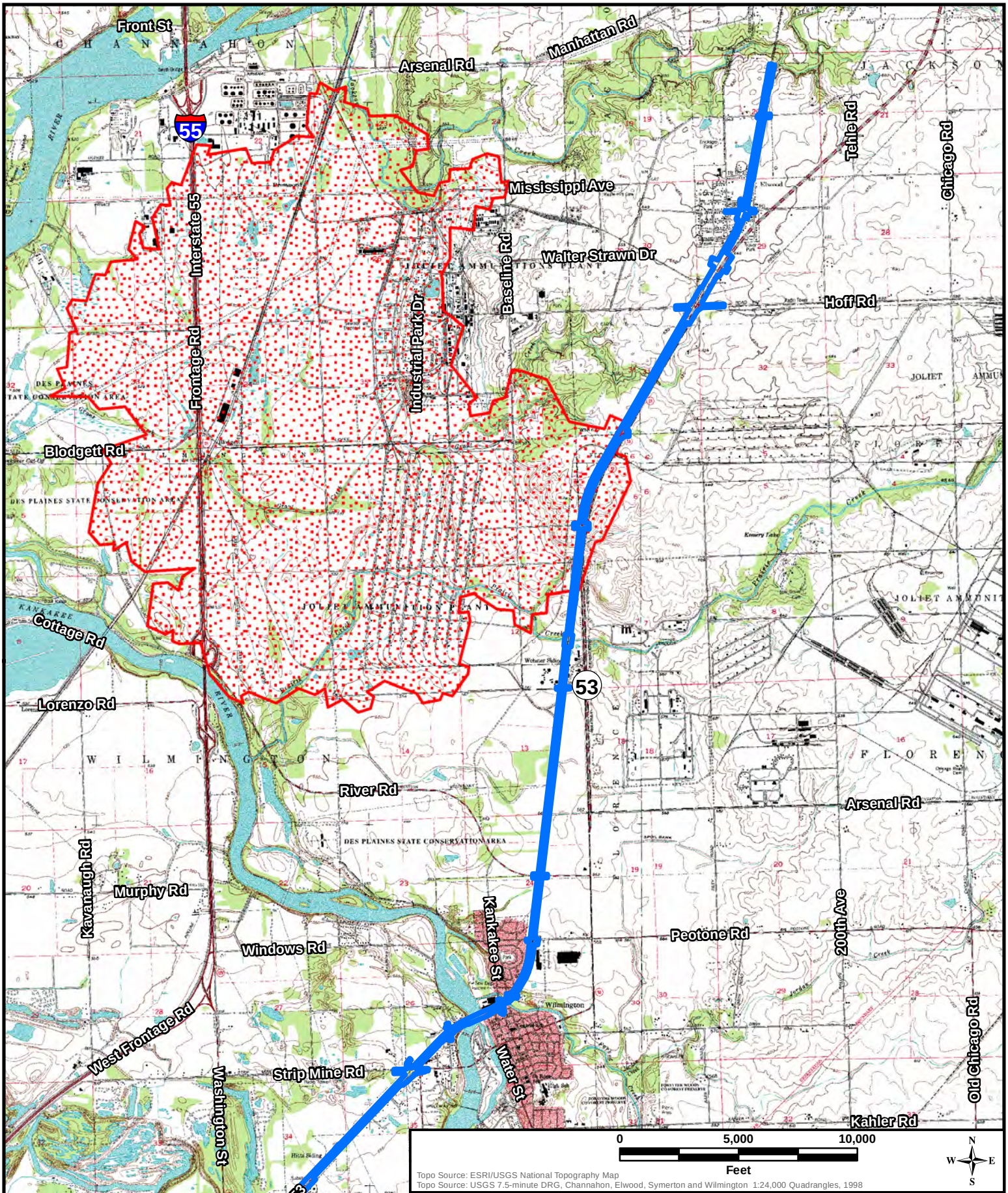

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Figure 6
Project Location Map
Elwood to Braidwood Track
Construction Project (Tier 8)
Project Limits within the High Potential Zone Map
Will County, Illinois

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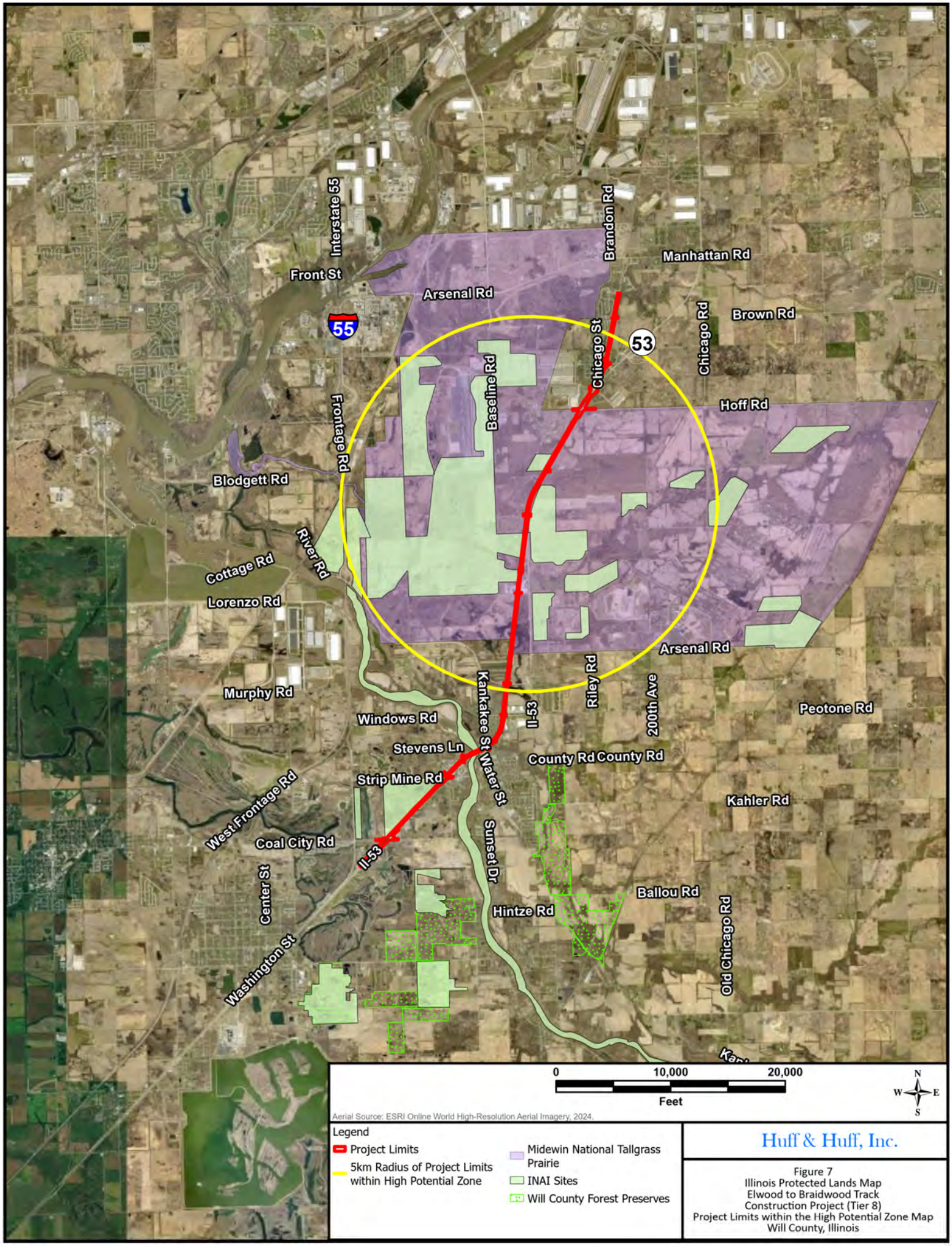

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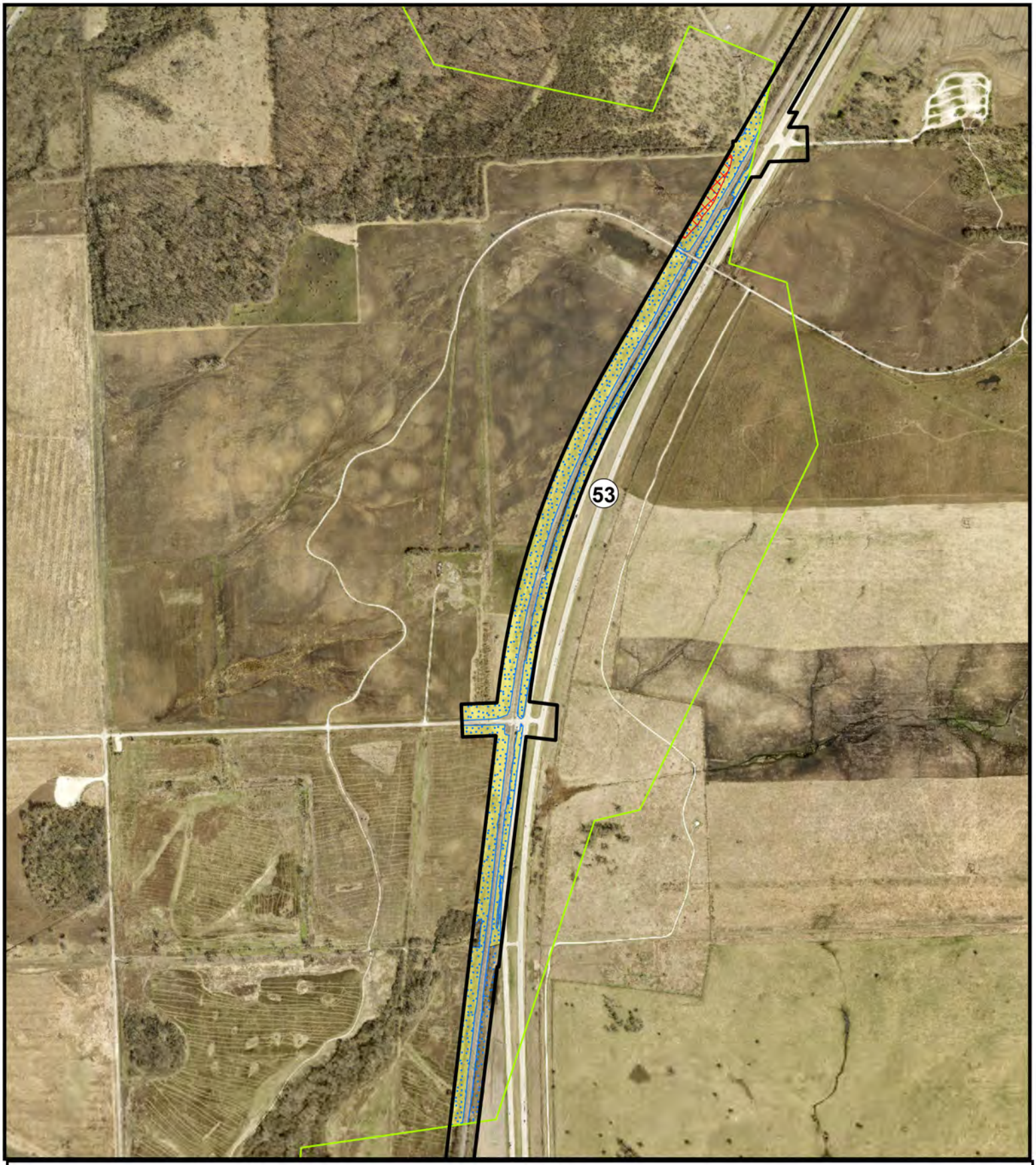
Figure 7
Illinois Protected Lands Map
Elwood to Braidwood Track
Construction Project (Tier 8)
Project Limits within the High Potential Zone Map
Will County, Illinois



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Aerial Source: ESRI Online World High-Resolution Aerial Imagery, 2024.

Legend

- Project Limits
- High Potential Zone
- Nesting
- Overwintering
- Spring and Summer Foraging

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Figure 8
RPBB Habitat Map
Elwood to Braidwood Track
Construction Project (Tier 8)
Project Limits within the High Potential Zone Map
Will County, Illinois

Attachment 2

Rusty Patched Bumble Bee Habitat Assessment Form & Guide

XERCES SOCIETY
for Invertebrate Conservation

Rusty Patched Bumble Bee Habitat

Assessment Form & Guide

May 2017

The Xerces Society for
Invertebrate Conservation

www.xerces.org

Acknowledgements

Acknowledgements

Support for the Xerces® Society's Pollinator Conservation and Endangered Species Programs is provided by the USDA Natural Resources Conservation Service, Audrey and J.J. Martindale Foundation, Cascadian Farm, Ceres Trust, Cinco, Clif Bar Family Foundation, Columbia Foundation, CS Fund, Disney Worldwide Conservation Fund, The Dudley Foundation, The Elizabeth Ordway Dunn Foundation, Endangered Species Chocolate, LLC, Gaia Fund, General Mills, Irwin Andrew Porter Foundation, Justin's, J. Crew, McCune Charitable Foundation, The Metabolic Studio, Organic Farm Research Foundation, Organic Valley Farmers Advocating for Organics Fund, Panta Rhea Foundation, Regina Bauer Frankenberg Foundation, Swimmer Family Foundation, Sarah K. de Coizart Article TENTH Perpetual Charitable Trust, SeaWorld & Busch Gardens Conservation Fund, Turner Foundation, Inc., The White Pine Fund, Whole Foods Market and their vendors, Whole Systems Foundation, and Xerces Society members.

Thanks to Megan Benage, Crystal Boyd, Carmen Converse, Greg Hoch, and Carmelita Nelson at the Minnesota Department of Natural Resources for providing thoughtful feedback on this form, as well as the opportunity to test this tool with land managers.

Authors

This guide was adapted from a generic pollinator habitat assessment tool developed by Sarah Foltz Jordan, Mace Vaughan, Eric Lee-Mäder, Jennifer Hopwood, Jessa Kay Cruz, Brianna Borders, Jolie Goldenetz Dollar, Kelly Gill, Nancy Adamson, and Anne Stine. Adaptations for the rusty patched bumble bee were developed by Rich Hatfield, Sarina Jepsen, Sarah Foltz Jordan, Aimée Code, and Susan Carpenter.

Editing and layout

Sara Morris and Michele Blackburn. Template by Jessa Kay Cruz, Matthew Shepherd, Ashley Minnerath, and Hailey Walls.

Cover Photographs

Cover main: A wooded bluff and streamside prairie in the Driftless Area of Wisconsin (photograph by Susan Carpenter, UW-Madison Arboretum); left: *Bombus affinis* (rusty patched bumble bee) on joe pye weed, *Eutrochium purpureum* (photograph by Rich Hatfield, The Xerces Society); right: eastern woodland with pollinator-friendly understory (photograph by Jennifer Hopwood, The Xerces Society).

Photographs

We are grateful to the photographers for allowing us to use their wonderful photographs. Susan Carpenter, UW-Madison Arboretum: 2, 3, 10a, 10c. Sarah Foltz Jordan, the Xerces Society: 7a, 7b. Eric Lee-Mäder, The Xerces Society: 7c, 7d. Johanna James: 9. Dustin Blakey, Flickr: 10b. Jennifer Hopwood, The Xerces Society: 10d. Scott Seigfreid: 12. The copyright for all photographs is retained by the photographers. None of the photographs may be reproduced without permission from the photographer. If you wish to contact a photographer, please contact the Xerces Society at the address below.

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The Xerces Society for Invertebrate Conservation is a nonprofit organization that protects wildlife through the conservation of invertebrates and their habitat. Established in 1971, the Society is at the forefront of invertebrate protection, harnessing the knowledge of scientists and enthusiasm of citizens to implement conservation programs worldwide. The Society uses advocacy, education, and applied research to promote invertebrate conservation.

Rusty Patched Bumble Bee Conservation

Habitat Assessment Form and Guide

Purpose

The rusty patched bumble bee (*Bombus affinis*) is listed as an endangered species by the U.S. Fish and Wildlife Service. This species has specific habitat requirements, including high quality foraging resources, nesting sites, overwintering sites, and protection from pesticides, introduced diseases, and other disturbances. This tool is meant to help educate conservation planners and landowners, prioritize conservation actions, and quantify habitat or land management improvements for the rusty patched bumble bee on a single site. As existing conditions and degree of habitat management at any given site are different the goal of this tool is not to compare one site with another. Rather, it is intended to help incorporate conservation efforts for the rusty patched bumble bee into a landscape management plan and then identify specific actions for habitat improvement and/or management practices to help protect the rusty patched bumble bee from potential threats. As with any tool of this nature, the evaluation and scoring practice is a subjective process, and the usefulness of the tool is dependent upon the consistency and skills of the evaluator. While the goal is to implement changes that will result in improved habitat, there may not always be a viable treatment for individual variables. The scoring goals outlined in the instructions are general guidelines, but the capacity to reach or exceed these goals varies widely in different landscapes and may be refined by conservation planners for a more regionally specific pollinator habitat assessment guide. This guide was developed with the purpose of assessing sites where the rusty patched bumble bee has been recently detected, but can also be employed by anyone seeking to improve their land for bumble bees.

Instructions

- This rusty patched bumble bee habitat assessment guide is designed for natural areas on public and private lands. If you are working in a farm landscape, please consider using our *Pollinator Habitat Assessment Form and Guide: Farms and Agricultural Landscapes* (available as a free download at: www.xerces.org/habitat-assessment-guides/; Note: this assessment form is not specific to the rusty patched bumble bee).
- The accompanying photos and notes will help you identify and assess some specific habitat features.
- An assessment would ideally be done twice, once during the habitat evaluation process (before project implementation) and once after any changes have been implemented.
- Each item in the assessment should be given a score of 0 if not present or the appropriate value from the "Score" column.
- If you are conducting an assessment for the USFWS, obtain the 10 x 10 km grid ID and sighting ID directly from the Service (contact your local field office: https://www.fws.gov/midwest/es/fld_off.html). Use the 10 x 10 km grid cell to address question 1a.
- If this is not an official USFWS assessment, address question 1a using an online mapping program with a satellite view. Assess the habitat within a 5 km radius of your location.
- Prior to conducting an assessment, print aerial photos to help with site and landscape questions.
- Add up the scores to calculate a subtotal for each subsection.
- Next, add up subsection subtotals to get a total for each section. Transfer these figures into the summary table on page 3 to generate the overall score for each assessment.
- Ideally, landowners/managers should strive to achieve an overall score of at least 100, and an improvement of at least 40 points. If this is not possible for your region or land management plan, talk to your area biologist, regional ecologist, or planner for guidance.

A southern Wisconsin planting of diverse native prairie forbs that provides floral resources throughout the growing season.

Site Summary

Obtain the Grid ID and RPBB sighting ID from the USFWS. If this is not an official assessment leave blank.

Owner/ Operator: IDOT/Union Pacific Railroad		Planner:
10 km x 10 km Grid ID: 22177		Associated RPBB sighting ID:
Survey locality/address: 41.375948°, -88.130510°		
Dates	Existing condition assessment: 1/10/2025	
	Assessment after implementation: N/A	

Define and describe the project area (attach annotated maps; include Ecological Classification System information, if known):

The project area consists of undeveloped land associated with Midewin National Tallgrass Prairie, Abraham Lincoln National Cemetery, the Union Pacific Railroad (UPRR), and Illinois Route 53 (IL 53), and associated rights-of-way (ROW) within Elwood, Will County, Illinois. The Illinois Department of Transportation (IDOT), with the Federal Railroad Administration (FRA), proposes to construct a second track adjacent to the existing mainline of the UPRR.

This guide reviews approximately 1.6 miles of the project limits which lie within a High Potential Zone (HPZ) for the rusty patched bumble bee *(Bombus affinis*; RPBB). This project area contains Illinois Natural Areas Inventory (INAI) site number 1369, the Joliet Army Ammunition Plant, listed as a category II site (specific suitable habitat for state-listed species or state-listed species relocations).

ECS 54a - Illinois/Indiana Prairies

Total Score for Habitat Assessment

The figures entered into this summary table will be calculated during completion of the assessment.

	BEFORE	AFTER
Section 1: Regional and Landscape Features *(max score 20)*	10	
Section 2: Site Features *(max score 35)*	17	
Section 3: Foraging Habitat *(max score 50)*	41	
Section 4: Nesting and Overwintering Habitat *(max score 30)*	17	
Section 5a: Pesticide Practices *(max score 40)*	40	
Section 5b: Management Practices *(max score 40)*	0	
OVERALL SCORE	125	

Section 1: Regional and Landscape Features

The characteristics of regional and landscape features have a significant impact on the rusty patched bumble bee and its ability to successfully find a mate and reproduce. The landscape characteristics at this scale may not be changeable, but will help determine the scale at which local habitat management matters.

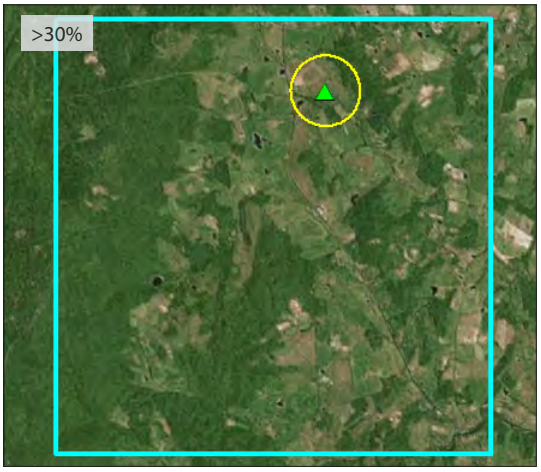
1a. Percentage of the grid cell that is natural habitat. This land use cover includes prairie, shrub lands, woodlands, grasslands, riparian habitat, wetlands, and non-invasive weedy areas. It does NOT include lawn grass, cropland, or overgrazed pasture. Using the 10 x 10 km grid cells provided by the USFWS, or area within a 5 km radius of your location, analyze the proportion of the habitat that is natural. See photos below for guidance (blue area is at the scale of 10 x 10 km).

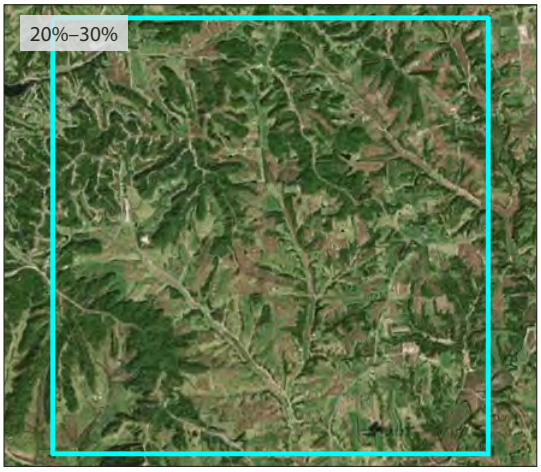
Max score of 10.

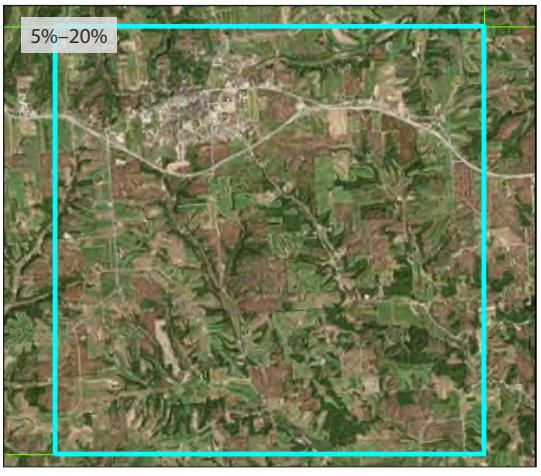
SELECT ONLY ONE	Score	Existing Condition
>30%	10	
20%–30%	7	
5%–20%	3	
<5%	0	
Subtotal (1a)		7

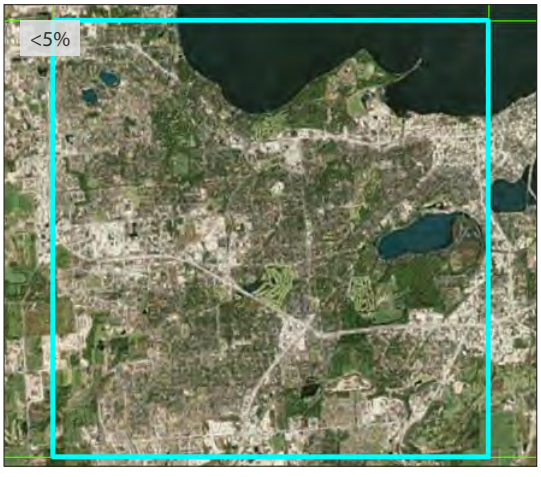
(1a)

The photos below illustrate the different percent covers.









Go to top of page 6

Continue here

Section 1: Regional and Landscape Features *continued*

1b. The assessment area is defined by the unit of land on which management can be implemented to improve habitat for the rusty patched bumble bee. With that in mind, what is the dominant vegetation within ½ mile of assessment area including the assessment area itself. *Max score of 10.*

SELECT ONLY ONE	Score	Before	After	Treatment to increase score (no treatment if off-site)
Native plants	10			
Mix of native and naturalized (non-invasive) plants	7			
Naturalized flowering species (e.g., alfalfa)	5			
Mix of native, naturalized, and weedy/invasive species	3			
Invasive flowering weeds, crops and/or sod-forming grasses	0			
Subtotal (1b)		3		
Regional and Landscape Features Total		10		

(1a)

(1b)

(1a + 1b)

Section 2: Site Features

On-site natural areas and other features have a significant influence on bumble bee abundance and diversity.

Section 2: Site Features

2a. Percentage of site that is in natural or semi-natural habitat.

Max score of 10.

SELECT ONLY ONE	Score	Before	After	Treatment to increase score
>75%	10			
50%–75%	7			
25%–49%	5			
10%–24%	3			
<10%	0			
Subtotal (2a)		5		

(2a)

2b. Additional site features that are present.

Max score of 25.

SCORE ALL OPTIONS THAT APPLY	Score	Before	After	Treatment to increase score
Permanent meadows or open areas with diverse native wildflowers allowed to bloom	10	10		
Pasture or hayed land with >30% non-invasive, bee-friendly forage legumes (e.g., red clover, alfalfa, etc.) allowed to bloom	5			
Wooded or wetland areas with diverse flowering trees, shrubs, and/or wildflowers (e.g., maples, basswood, willows, wild plum, spring blooming woodland ephemerals)	5	5		
Buffers: 2 points for every 20% of area within 25' of water features that is flowered, 1 point for every 20% of area that is grass, 0 points for no buffers	0–5	2		
Subtotal (2b)		17		
Site Features Total		20		

(2b)

(2a + 2b)

Section 3: Foraging Habitat

High flower abundance and season long bloom positively influence bee abundance and diversity.

3a. Percentage of vegetative cover that is comprised of forbs, flowering shrubs, or pollinator-friendly trees on site. *This does not include invasive or noxious species (e.g., Canada thistle, spotted knapweed, purple loosestrife, crown vetch, buckthorn, etc.).* *Max score of 10.*

SELECT ONLY ONE	Score	Before	After	Treatment to increase score
>50% cover	10			
30%–50% cover	7			
20%–30% cover	5			
10%–20% cover	3			
<10% cover	1			
Subtotal (3a)		3		

(3a)

The photos below illustrate some categories. *See page 12 for lists of preferred pollinator plants and other information.*

Go to top of page 8

Continue here

Section 3: Foraging Habitat *continued*

Section 3: Foraging Habitat

3b. Number of species of forbs, flowering shrubs, or pollinator-friendly trees on site that bloom in **spring** and support bees. *This includes fruit trees and some flowering weeds like dandelions, but does not include invasive or noxious species (see https://plants.usda.gov/java/noxiousDriver for examples).*

Max score of 10.

SELECT ONLY ONE	Score	Before	After	Treatment to increase score
10+ species	10			
5–9 species	5			
1–4 species	3			
0 species	0			
Subtotal (3b)		10		

(3b)

3c. Number of species of forbs, flowering shrubs, or pollinator-friendly trees on site that bloom in **summer** and support bees. *This includes some flowering non-native plants, such as red clover, but does not include invasive or noxious species (see https://plants.usda.gov/java/noxiousDriver for examples).*

Max score of 10.

SELECT ONLY ONE	Score	Before	After	Treatment to increase score
18+ species	10			
10–17 species	7			
1–9 species	3			
0 species	0			
Subtotal (3c)		10		

(3c)

3d. Number of species of forbs, flowering shrubs, or pollinator-friendly trees on site that bloom in **fall** and support bees. *This includes some flowering non-native plants, such as red clover, but does not include invasive or noxious species (see https://plants.usda.gov/java/noxiousDriver for examples).*

Max score of 10.

SELECT ONLY ONE	Score	Before	After	Treatment to increase score
10+ species	10			
5–9 species	7			
1–4 species	5			
0 species	0			
Subtotal (3d)		10		

(3d)

(3a)

Go to top of page 9

Continue here

Section 3: Foraging Habitat *continued*

Section 3: Foraging Habitat

3e. Rusty patched bumble bee superfoods. The rusty patched bumble bee has been observed most commonly on the following plants. How many of these plants are present on site? Note that some of these species may not be appropriate for every region/site.

Wild bergamot (*Monarda fistulosa*), prairie clover (*Dalea* spp.), hyssop (*Agastache* spp.), goldenrod (*Solidago* spp.), joe pye weed (*Eutrochium* spp.), coneflowers (*Echinacea* spp.), native thistles (*Cirsium* spp.), asters (*Symphyotrichum* spp.), leadplant (*Amorpha canescens*), jewelweed (*Impatiens capensis*), mountain mint (*Pycanthemum* spp.), native spiraea (*Spiraea* spp.), and wild cranberry (*Vaccinum* spp.).

Max score of 7.

SELECT ONLY ONE (how many species of bumble bee superfoods are present on site?)	Score	Before	After	Treatment
9–13 species	7			
5–8 species	5			
1–4 species	2			
0 species	0			
Subtotal (3e)		5		

→ (3e)

3f. In addition to plants that are known to be attractive to the rusty patched bumble bee, the following plants are known to help build bumble bee immune systems. How many of these plants are present on site? Note that some of these species may not be appropriate for every region/site.

Wild bergamot (*Monarda fistulosa*), sunflowers (*Helianthus* spp.), white turtlehead (*Chelone glabra*), penstemon (*Penstemon* spp.), and wild blueberry/cranberry (*Vaccinium* sp.).

Max score of 3.

SCORE THIS OPTION	Score	Before	After	Treatment
Score 1 point, up to 3 for each species present	0–3			
Subtotal (3f)		3		

→ (3f)

Foraging Habitat Total		41		

← (3a + 3b + 3c + 3d + 3e + 3f)

(3a-d)

The rusty patched bumble bee (*Bombus affinis)* nectars on monarda.

Section 4: Nesting and Overwintering Habitat

Bumble bee colony success is often limited by the availability of suitable nesting and overwintering sites. Diverse habitat features will increase the likelihood of nesting and overwintering success.

4. Bumble bee nesting preferences vary by species and local habitat conditions. Generally, bumble bees nest under ground, often in abandoned rodent nests. They are also known to nest in dry cavities above ground, such as in rock walls or under clump-forming bunch grasses. The nests are often found under woody plants, tall grasses, or hidden among vegetation or plant materials, and can be difficult to detect. Bumble bees often overwinter underneath leaf litter, in the duff layer of forests, or under loose soils.

Max score of 30.

SCORE ALL OPTIONS THAT APPLY	Score	Before	After	Treatment to increase score
Areas of undisturbed (for example, ungrazed) native bunch grasses (clump-forming)	>20% = 5 ~20% = 3 <5% = 1	3		
Areas with loose soil with evidence of rodent activity (holes, surface tunnels, etc.) (compacted or hard packed bare ground does not count toward the total)	>20% = 5 ~20% = 3 <5% = 1	3		
1 point for every 10% of area that is unmowed, ungrazed, and not subject to controlled burning	0–10	3		
Areas of site with woody cover, or other sheltered areas where bumble bees could build their nest or overwinter (downed wood, rock walls, brush piles, forest duff layer, etc.)	>20% = 5 ~20% = 3 <5% = 1	3		
Leaf litter left on site in the fall and through the spring (for overwintering queens)	5	5		
Nesting and Overwintering Habitat Total		17		

The photos below illustrate some typical nesting and overwintering habitat.


a


b


c


d

Section 5: Management and Pesticide Practices

Management practices in and adjacent to habitat areas have a significant influence on bumble bee populations.

5a. Pesticide use, including pollinator-toxic insecticides. *Max score of 40.*

SCORE ALL OPTIONS THAT APPLY	Score	Before	After	Treatment to increase score
Invasive weed control, if any, carried out with targeted herbicide applications, rather than broadcast (also score 5 if herbicides are not used)	5	5		
No use of insecticides on site and no suspected use on adjacent lands (If yes, score points and continue to 5b)	35	35		
No use of fungicides on site (5 pts). The only fungicides used on site are part of an IPM program that specifically addresses pollinator protection, and each use has a documented need to manage an economic or public health pest (2 pts)	0-5			
If any insecticides are used on site they are part of an IPM program that specifically addresses pollinator protection, and are for the management of economic or public health pests (e.g., emerald ash borer or disease transmitting mosquitoes). Also score points if no insecticides are used on site.	8			
Pollinator habitat on site is adequately buffered from insecticide applications including: • Min. 125' buffer from any neonicotinoid use on and/or adjacent to site (including seed treatment) (2 pts) • No aerial (helicopter/airplane) applications on and/or adjacent to site (2 pts) • Min. 60' spatial buffer from any airblast applications of other (non-neonicotinoid) insecticides on and/or adjacent to site (1 pt) • Min. 40' spatial buffer from any non-airblast ground applications of insecticides on and/or adjacent to site (1 pt) • Vegetative buffers, even if they do not meet the distance minimums listed above, include the use of larger-stature non-pollinator attractive vegetation (e.g., coniferous hedge rather than mowed grass) (2 pts)	Score points for each bullet point met			
If insecticides are used spray drift is carefully controlled and spray equipment is calibrated annually, as per state regulations. Also score points if no insecticides are used on site.	2			
Pesticide Practices Total		40		

5b. Land management techniques used on the site or in adjacent area. *These questions pertain to ongoing site management as opposed to site preparation. Note 'n/a' if option is not applicable to the site.*

Max score of 40.

SCORE ALL OPTIONS THAT APPLY (M = Management Matches Description, S = Somewhat Matches, N = No Match, N/A = Doesn't apply	Score	Before	After	Treatment to increase score
If mowing or haying occurs, then entire disturbed area is limited to ⅓ of habitat per year. Haying or mowing is done patchily, at reduced speeds (<8 mph), with high mower height (12–16"), and in late summer (after peak bloom).	M = 10 S = 5 N = 0 N/A	NA		
If site is grazed, then conservation grazing plan is in place and includes prescribed grazing practices that encourage wildflower diversity/abundance, such as low intensity grazing, or short duration grazing with long recovery periods.	M = 10 S = 5 N = 0 N/A	NA		
If burning occurs, then entire disturbed area is limited to ⅓ of habitat per year, and a patchy burn approach is used leaving numerous skips and unburned patches. A 3–10 year burn rotation period is used, and the time of year when burning occurs is varied. Rare invertebrate species and their specific needs are considered.	M = 10 S = 5 N = 0 N/A	NA		
Managed bees (both honey bees, and commercial bumble bees) are known to both compete with native bumble bees, and have been shown to transmit diseases to wild bumble bees. When the rusty patched bumble bee is near, it is best to avoid the use of managed bees, and honey bees. If honey bees are used they should be kept at low densities. (no managed bees = M, <0.5 Honey bee hive/acre = S, >0.5 Honey bee hive/acre and/or commercial bumble bees present = N).	M = 10 S = 5 N = 0	NA		
Management Practices Total		0		

Habitat Assessment Reference Materials

General Pollinator Conservation

Protecting Habitat From Pesticide Contamination
This guidance document was designed to help land managers safeguard pollinator habitat from harmful pesticide contamination. It includes information on selecting habitat sites, as well as ways to maintain clean habitat by limiting and carefully managing pesticide use.
http://www.xerces.org/wp-content/uploads/2016/10/ProtectingHabitatFromPesticideContamination_oct2016-02.pdf

Pollinator Conservation Resource Center
The Pollinator Conservation Resource Center includes regional information on plants for pollinator habitat enhancement, habitat conservation guides, nest management instructions, bee identification and monitoring resources, and directories of native pollinator plant nurseries.
www.xerces.org/pollinator-resource-center/

Attracting Native Pollinators
A complete guide to the fascinating lives of these vital creatures. The book includes detailed profiles of over 30 commonly encountered bee genera and more than 50 pages of fully-illustrated plant lists that enable you to choose the best plants for your region.
http://xerces.org/announcing-the-publication-of-attracting-native-pollinators/

Upper Midwest Citizen Science Monitoring Guide: Native Bees
Developed by the Xerces Society, this guide provides instructions for assessing pollinator habitat quality and diversity in the Upper Midwest by monitoring native bees. It was developed for conservationists, farmers, land managers, and restoration professionals to document how native bee communities change over time in pollinator habitats.
http://xerces.org/wp-content/uploads/2016/05/UpperMidwestBeeCSMG_May2016_web.pdf

Pollinator Habitat Installation Guides
These regional guidelines provide in-depth practical guidance on how to install and maintain foraging and nesting habitat for pollinators in wildflower meadow plantings or linear rows of native flowering shrubs. Region-specific seed mixes and plant recommendations are included in the appendices of each guide.
http://xerces.org/pollinator-conservation/agriculture/pollinator-habitat-installation-guides/

Pollinators in Natural Areas: A Management Primer
A fact sheet discussing the importance of pollinators in natural areas, as well as their habitat needs. An extensive list of references is also provided.
http://www.xerces.org/wp-content/uploads/2008/11/pollinators_in_natural_areas_xerces_society.pdf

Inside Agroforestry–Windbreaks
An article about using windbreaks to provide pollinator habitat or to capture pesticide drift.
http://nac.unl.edu/documents/insideagroforestry/vol20issue1.pdf

Introduced, Invasive, and Noxious Plants
Federal and state noxious weed lists, invasive plant lists, and introduced plant lists, with links to more information.
https://plants.usda.gov/java/noxiousDriver

An overview of the potential impacts of honey bees to native bees, plant communities, and ecosystems in wild landscapes: Recommendations for land managers
A review of the potential threats that managed bees may pose to native bees, including the rusty patched bumble bee.
http://www.xerces.org/wp-content/uploads/2016/09/Xerces_policy_statement_HB_Final.pdf

Bumble Bee Conservation

Conserving Bumble Bees: Guidelines for Creating and Managing Habitat for America's Declining Pollinators
A publication to help landowners and managers create, protect, and restore habitat for bumble bee populations.
www.xerces.org/wp-content/uploads/2012/06/conserving_bb.pdf

Bumble Bee Watch
A collaborative citizen science effort to track and conserve North America's bumble bees.
www.bumblebeewatch.org

Bumble Bee Pocket Identification Guides
Pocket identification guides are available for the following species: the rusty patched bumble bee (*Bombus affinis*), the western bumble bee (*Bombus occidentalis*), and the yellowbanded bumble bee (*Bombus terricol*a).
http://xerces.org/identification-guides/bumble-bee-pocket-id/

Lady Bird Johnson and Xerces Society Plant Database for Bumble Bees
The Xerces Society partnered with the Lady Bird Johnson Wildflower Center to generate a list of plants that are of special value to bumble bees.
www.xerces.org/lbj

This mesic prairie provides both forage and nesting habitat with a mix of native wildflowers and bunch grasses.

Attachment 3

Photographic Log

Elwood to Braidwood Track Construction Project
(Mainline of the Union Pacific Railroad [UPRR] from MP 44.60 to MP 55.50)
Rusty Patched Bumble Bee Habitat Assessment Photographic Log
June 4, 2024

Client Name: WSP USA, Inc.	**Site Location:** Elwood to Braidwood Track Construction Project	**Project No.** 81.0220288.18

Photo 1 Facing northwest toward a mesic prairie which provides High Quality habitat for the rusty patched bumble bee (*Bombus affinis;* RPBB) located approximately 140 feet west of the Union Pacific Railroad (UPRR) and 100 feet north of the Henslow Trail.

Photo 2 Facing east toward a mesic prairie and scrub shrub area from approximately 1,000 feet northwest of the Henslow Trail bridge over the UPRR.

Photo 3 Facing southwest toward a mesic prairie from approximately 270 feet southwest of the Henslow Trail bridge over the UPRR.

Photo 4 Facing northeast toward a mesic prairie from approximately 1,500 feet southwest of the Henslow Trail bridge over the UPRR.

Elwood to Braidwood Track Construction Project
(Mainline of the Union Pacific Railroad [UPRR] from MP 44.60 to MP 55.50)
Rusty Patched Bumble Bee Habitat Assessment Photographic Log
June 4, 2024

Client Name: WSP USA, Inc.	**Site Location:** Elwood to Braidwood Track Construction Project	**Project No.** 81.0220288.18

Photo 5 Facing southwest toward a mesic prairie from approximately 1,500 feet southwest of the Henslow Trail bridge over the UPRR.

Photo 6 Facing north toward a mesic meadow from approximately 0.6 miles south of Henslow Trail, west of the UPRR.

Photo 7 Facing south toward a mesic meadow from approximately 100 feet northwest of the UPRR and Joliet Arsenal Road intersection.

Photo 8 Facing an Indian plantain (*Arnoglossum atriplicifolium*), a known floral associate of the RPBB, found within the foraging habitat within the HPZ west of the UPRR.

Attachment 4

Floristic Quality Assessment

FLORISTIC QUALITY ASSESSMENT - High Quality Area
Rusty Patch Bumble Bee Habitat Assessment Memo
Elwood to Braidwood Track Construction Project
Unincorporated, Will County, Illinois

CONSERVATISM-BASED METRICS		ADDITIONAL METRICS	
MEAN C (NATIVE SPECIES)	3.96	SPECIES RICHNESS (ALL)	74
MEAN C (ALL SPECIES)	2.68	SPECIES RICHNESS (NATIVE)	50
MEAN C (NATIVE TREES)	0.00	% NON-NATIVE	0.32
MEAN C (NATIVE SHRUBS)	1.67	WET INDICATOR (ALL)	0.53
MEAN C (NATIVE HERBACEOUS)	4.16	WET INDICATOR (NATIVE)	0.40
FQAI (NATIVE SPECIES)	28.00	% HYDROPHYTE (MIDWEST)	0.42
FQAI (ALL SPECIES)	23.02	% NATIVE PERENNIAL	0.64
ADJUSTED FQAI	32.55	% NATIVE ANNUAL	0.03
% C VALUE 0	0.38	% ANNUAL	0.03
% C VALUE 1-3	0.23	% PERENNIAL	0.89
% C VALUE 4-6	0.27		
% C VALUE 7-10	0.12		

SPECIES ACRONYM	SPECIES NAME (NWPL/ MOHLENBROCK)	SPECIES (SYNONYM)	COMMON NAME	C VALUE	MIDWEST WET INDICATOR	WET INDICATOR (NUMERIC)	HABIT	DURATION	NATIVITY
ACHMIL	Achillea millefolium	ACHILLEA MILLEFOLIUM	Common Yarrow	0	FACU	1	Forb	Perennial	Adventive
ALLCAN	Allium canadense	Allium canadense	Meadow Garlic	3	FACU	1	Forb	Perennial	Native
ALOPRA	Alopecurus pratensis	ALOPECURUS PRATENSIS	Field Meadow-Foxtail	0	FACW	-1	Grass	Perennial	Adventive
AMBART	Ambrosia artemisiifolia	Ambrosia artemisiifolia elatior	Annual Ragweed	0	FACU	1	Forb	Annual	Native
APOCAN	Apocynum cannabinum	Apocynum sibiricum	Indian-Hemp	2	FAC	0	Forb	Perennial	Native
ARNATR	Arnoglossum atriplicifolium	Cacalia atriplicifolia	Indian-Plantain	8	UPL	2	Forb	Perennial	Native
BROINE	Bromus inermis	BROMUS INERMIS	Smooth Brome	0	FACU	1	Grass	Perennial	Adventive
CALCAN	Calamagrostis canadensis	Calamagrostis canadensis	Bluejoint	6	OBL	-2	Grass	Perennial	Native
CXBLAN	Carex blanda	Carex blanda	Eastern Woodland Sedge	1	FAC	0	Sedge	Perennial	Native
CXSCOP	Carex scoparia	Carex scoparia	Pointed Broom Sedge	5	FACW	-1	Sedge	Perennial	Native
CXSTIP	Carex stipata	Carex stipata	Stalk-Grain Sedge	4	OBL	-2	Sedge	Perennial	Native
CELORB	Celastrus orbiculatus	CELASTRUS ORBICULATUS	Asian Bittersweet	0	UPL	2	Vine	Perennial	Adventive
CIRARV	Cirsium arvense	CIRSIUM ARVENSE	Canadian Thistle	0	FACU	1	Forb	Perennial	Adventive
CIRVUL	Cirsium vulgare	CIRSIUM VULGARE	Bull Thistle	0	FACU	1	Forb	Biennial	Adventive
CORLAN	Coreopsis lanceolata	Coreopsis lanceolata	Lance-Leaf Tickseed	8	FACU	1	Forb	Perennial	Native
CORTRI	Coreopsis tripteris	Coreopsis tripteris	Tall Tickseed	5	FAC	0	Forb	Perennial	Native
CORRAC	Cornus racemosa	Cornus racemosa	Gray Dogwood	1	FAC	0	Shrub	Perennial	Native
DACGLO	Dactylis glomerata	DACTYLIS GLOMERATA	Orchard Grass	0	FACU	1	Grass	Perennial	Adventive
DAUCAR	Daucus carota	DAUCUS CAROTA	Queen Anne's Lace	0	UPL	2	Forb	Biennial	Adventive
DIPLAC	Dipsacus laciniatus	DIPSACUS LACINIATUS	Cut-Leaf Teasel	0	UPL	2	Forb	Biennial	Adventive
EQUARV	Equisetum arvense	Equisetum arvense	Field Horsetail	0	FAC	0	Fern	Perennial	Native
EQUHYE	Equisetum hyemale	Equisetum hyemale	Tall Scouring-Rush	1	FACW	-1	Fern	Perennial	Native
ERIANN	Erigeron annuus	Erigeron annuus	Eastern Daisy Fleabane	0	FACU	1	Forb	Biennial	Native
ERIPHI	Erigeron philadelphicus	Erigeron philadelphicus	Philadelphia Fleabane	4	FACW	-1	Forb	Perennial	Native
ERYYUC	Eryngium yuccifolium	Eryngium yuccifolium	Button Eryngo	9	FAC	0	Forb	Perennial	Native
GALAPA	Galium aparine	Galium spurium	Sticky-Willy	0	FACU	1	Forb	Annual	Native
GERMAC	Geranium maculatum	Geranium maculatum	Spotted Crane's-Bill	5	FACU	1	Forb	Perennial	Native
GEULAC	Geum laciniatum	Geum laciniatum	Rough Avens	3	FACW	-1	Forb	Perennial	Native
HELDIV	Helianthus divaricatus	Helianthus divaricatus	Woodland Sunflower	5	UPL	2	Forb	Perennial	Native
HELGRO	Helianthus grosseserratus	Helianthus grosseserratus	Saw-Tooth Sunflower	4	FACW	-1	Forb	Perennial	Native
HELMOL	Helianthus mollis	Helianthus mollis	Downy Sunflower	9	UPL	2	Forb	Perennial	Native
HELHEL	Heliopsis helianthoides	Heliopsis helianthoides	Smooth Oxeye	7	FACU	1	Forb	Perennial	Native
LEUVUL	Leucanthemum vulgare	CHRYSANTHEMUM LEUCANTHEMUM PINNATIFIDUM; LEUCANTHEMUM VULGARE VAR. PINNATIFIDUM	Ox-Eye Daisy	0	UPL	2	Forb	Perennial	Adventive

FLORISTIC QUALITY ASSESSMENT - High Quality Area
Rusty Patch Bumble Bee Habitat Assessment Memo
Elwood to Braidwood Track Construction Project
Unincorporated, Will County, Illinois

SPECIES ACRONYM	SPECIES NAME (NWPL/ MOHLENBROCK)	SPECIES (SYNONYM)	COMMON NAME	C VALUE	MIDWEST WET INDICATOR	WET INDICATOR (NUMERIC)	HABIT	DURATION	NATIVITY
LIAPYC	Liatris pycnostachya	Liatris pycnostachya	Cat-Tail Gayfeather	8	FAC	0	Forb	Perennial	Native
LOLPER	Lolium perenne	LOLIUM PERENNE	Perennial Rye Grass	0	FACU	1	Grass	Perennial	Adventive
LONTAT	Lonicera tatarica	LONICERA TATARICA	Twinsisters	0	FACU	1	Shrub	Perennial	Adventive
MEDSAT	Medicago sativa	MEDICAGO X VARIA	Alfalfa	0	FACU	1	Forb	Perennial	Adventive
MELLOF	Melilotus officinalis	MELILOTUS ALBA	Yellow Sweet-Clover	0	FACU	1	Forb	Biennial	Adventive
MONFIS	Monarda fistulosa	Monarda fistulosa	Oswego-Tea	4	FACU	1	Forb	Perennial	Native
MORALB	Morus alba	MORUS ALBA VAR. TATARICA	White Mulberry	0	FAC	0	Tree	Perennial	Adventive
ONOMOL	Onosmodium molle	Onosmodium hispidissimum	Marbleseed	5	UPL	2	Forb	Perennial	Native
OSMLON	Osmorhiza longistylis	Osmorhiza longistylis	Aniseroot	5	FACU	1	Forb	Perennial	Native
PARINT	Parthenium integrifolium	Parthenium integrifolium	Wild Quinine	8	UPL	2	Forb	Perennial	Native
PASSAT	Pastinaca sativa	PASTINACA SATIVA	Parsnip	0	UPL	2	Forb	Biennial	Adventive
PENDIG	Penstemon digitalis	Penstemon digitalis	Foxglove Beardtongue	4	FAC	0	Forb	Perennial	Native
PHLPRA	Phleum pratense	PHLEUM PRATENSE	Common Timothy	0	FACU	1	Grass	Perennial	Adventive
PHRAUSU	Phragmites australis ssp. australis	PHRAGMITES AUSTRALIS	Common Reed	0	FACW	-1	Grass	Perennial	Adventive
POAPRA	Poa pratensis	POA PRATENSIS	Kentucky Blue Grass	0	FAC	0	Grass	Perennial	Adventive
PYCTEN	Pycnanthemum tenuifolium	Pycnanthemum tenuifolium	Narrow-Leaf Mountain-Mint	7	FAC	0	Forb	Perennial	Native
RATPIN	Ratibida pinnata	Ratibida pinnata	Yellow Coneflower	4	UPL	2	Forb	Perennial	Native
RHUGLA	Rhus glabra	Rhus glabra	Smooth Sumac	1	UPL	2	Shrub	Perennial	Native
ROSMUL	Rosa multiflora	ROSA MULTIFLORA	Rambler Rose	0	FACU	1	Shrub	Perennial	Adventive
RUBALL	Rubus allegheniensis	Rubus allegheniensis	Allegheny Blackberry	3	FACU	1	Shrub	Perennial	Native
RUDFUL	Rudbeckia fulgida	RUDBECKIA FULGIDA	Orange Coneflower	0	OBL	-2	Forb	Perennial	Adventive
RUMCRI	Rumex crispus	RUMEX CRISPUS	Curly Dock	0	FAC	0	Forb	Perennial	Adventive
SANODO	Sanicula odorata	Sanicula gregaria	Clustered Black-Snakeroot	3	FAC	0	Forb	Perennial	Native
SCHSCO	Schizachyrium scoparium	Andropogon scoparius	Little False Bluestem	5	FACU	1	Grass	Perennial	Native
SCIPEN	Scirpus pendulus	Scirpus pendulus	Rufous Bulrush	2	OBL	-2	Sedge	Perennial	Native
SILINT	Silphium integrifolium	Silphium integrifolium var. deamii; Silphium integrifolium var. neglectum	Entire-Leaf Rosinweed	5	UPL	2	Forb	Perennial	Native
SILLAC	Silphium laciniatum	Silphium laciniatum	Compass-Plant	5	UPL	2	Forb	Perennial	Native
SILTER	Silphium terebinthinaceum	Silphium terebinthinaceum	Prairie Dock	5	FAC	0	Forb	Perennial	Native
SOLCAR	Solanum carolinense	SOLANUM CAROLINENSE	Carolina Horse-Nettle	0	FACU	1	Forb	Perennial	Adventive
SOLALT	Solidago altissima	Solidago altissima	Tall Goldenrod	1	FACU	1	Forb	Perennial	Native
SOLCAN	Solidago canadensis	Solidago canadensis	Canadian Goldenrod	1	FACU	1	Forb	Perennial	Native
SOLNEM	Solidago nemoralis	Solidago nemoralis	Gray Goldenrod	3	UPL	2	Forb	Perennial	Native
SPAPEC	Spartina pectinata	Spartina pectinata	Freshwater Cord Grass	4	FACW	-1	Grass	Perennial	Native
TRAOHI	Tradescantia ohiensis	Tradescantia ohiensis	Bluejacket	3	FACU	1	Forb	Perennial	Native
TRIPRA	Trifolium pratense	TRIFOLIUM PRATENSE	Red Clover	0	FACU	1	Forb	Perennial	Adventive
URTDIO	Urtica dioica ssp. gracilis	Urtica procera; Urtica gracilis	Tall Nettle	1	FACW	-1	Forb	Perennial	Native
VERURT	Verbena urticifolia	Verbena urticifolia var. leiocarpa	White Vervain	2	FAC	0	Forb	Perennial	Native
VERFAS	Vernonia fasciculata	Vernonia fasciculata	Prairie Ironweed	8	FACW	-1	Forb	Perennial	Native
VITAES	Vitis aestivalis	Vitis aestivalis	Summer Grape	5	FACU	1	Vine	Perennial	Native
VITRIP	Vitis riparia	Vitis riparia var. syrticola	River-Bank Grape	1	FACW	-1	Vine	Perennial	Native
ZIZAUR	Zizia aurea	Zizia aurea	Golden Alexanders	5	FAC	0	Forb	Perennial	Native

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Aerial Source: USDA-FSA-APFO NAIP MrSID Mosaic, 2012

Legend

- Project Survey Limits
- Aquatic Trap Locations
- Visual Meander Survey Areas

Figure 4B
Elwood to Braidwood Track Construction Project (Tier 8)
Turtle Survey Location Map
Will County, Illinois
Page 1 of 4

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Aerial Source: USDA-FSA-APFO NAIP MrSID Mosaic, 2012

Legend

- Project Survey Limits
- Aquatic Trap Locations
- Visual Meander Survey Areas

Figure 4B
Elwood to Braidwood Track Construction Project (Tier 8)
Turtle Survey Location Map
Will County, Illinois
Page 2 of 4

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Project Survey Limits
Aquatic Trap Locations
Visual Meander Survey Areas
Figure 4B
Elwood to Braidwood Track Construction
Project (Tier 8)
Turtle Survey Location Map
Will County, Illinois
Page 3 of 4
Huff & Huff, Inc.

Trap 9
Trap 10
Trap 10b
Trap 8
Trap 2
Trap 3
Trap 4
Trap 6
Trap 7
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Trap 3b
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Project Survey Limits
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Visual Meander Survey Areas
Figure 4B
Elwood to Braidwood Track Construction
Project (Tier 8)
Turtle Survey Location Map
Will County, Illinois
Page 4 of 4
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WSP USA, Inc.
High Speed Rail - Tier 8, Elwood to Braidwood
Will County, Illinois
Herpetofauna Surveys Photographic Log
September 14th through September 19th 2020

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 1 A representative small turtle trap with bait to survey for Blanding's turtles (*Emydoidea blandingii*).

Photo 2 A representative trap, partially submerged to capture turtles.

Photo 3 A representative large turtle trap, partially submerged to capture turtles.

Photo 4 Representative pond habitat in which trapping took place.

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 5 A successful trap with several painted turtle (*Chrysemys picta*) individuals.

Photo 6 GZA staff measuring a painted turtle specimen before releasing it.

Photo 7 A snapping turtle (*Chelydra serpentina*) in a turtle trap.

Photo 8 Facing north toward potential Blanding's turtle habitat located within Hitts Siding Prairie Nature Preserve, adjacent to an ornate box turtle (*Terrapene ornata*) meander survey transect

WSP USA, Inc.
High Speed Rail - Tier 8, Elwood to Braidwood
Will County, Illinois
Herpetofauna Surveys Photographic Log
September 14th through September 19th 2020

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 9 Representative habitat surveyed for the ornate box turtle. Photo taken at Midewin National Tallgrass Prairie.

Photo 10 Representative mesic prairie habitat surveyed for the ornate box turtle. Photo taken within Hitts Siding Prairie Nature Preserve.

Photo 11 Representative habitat surveyed for the ornate box turtle. Photo taken at Hitts Siding Prairie Nature Preserve.

Photo 12 An eastern garter snake (*Thamnophis sirtalis*) encountered during visual meander surveys.

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 13 A six-lined racerunner (*Aspidoscelis sexlineatus*) encountered duirng visual meander surveys.

Photo 14 A relict turtle shell from an unknown species encountered during visual meander surveys.

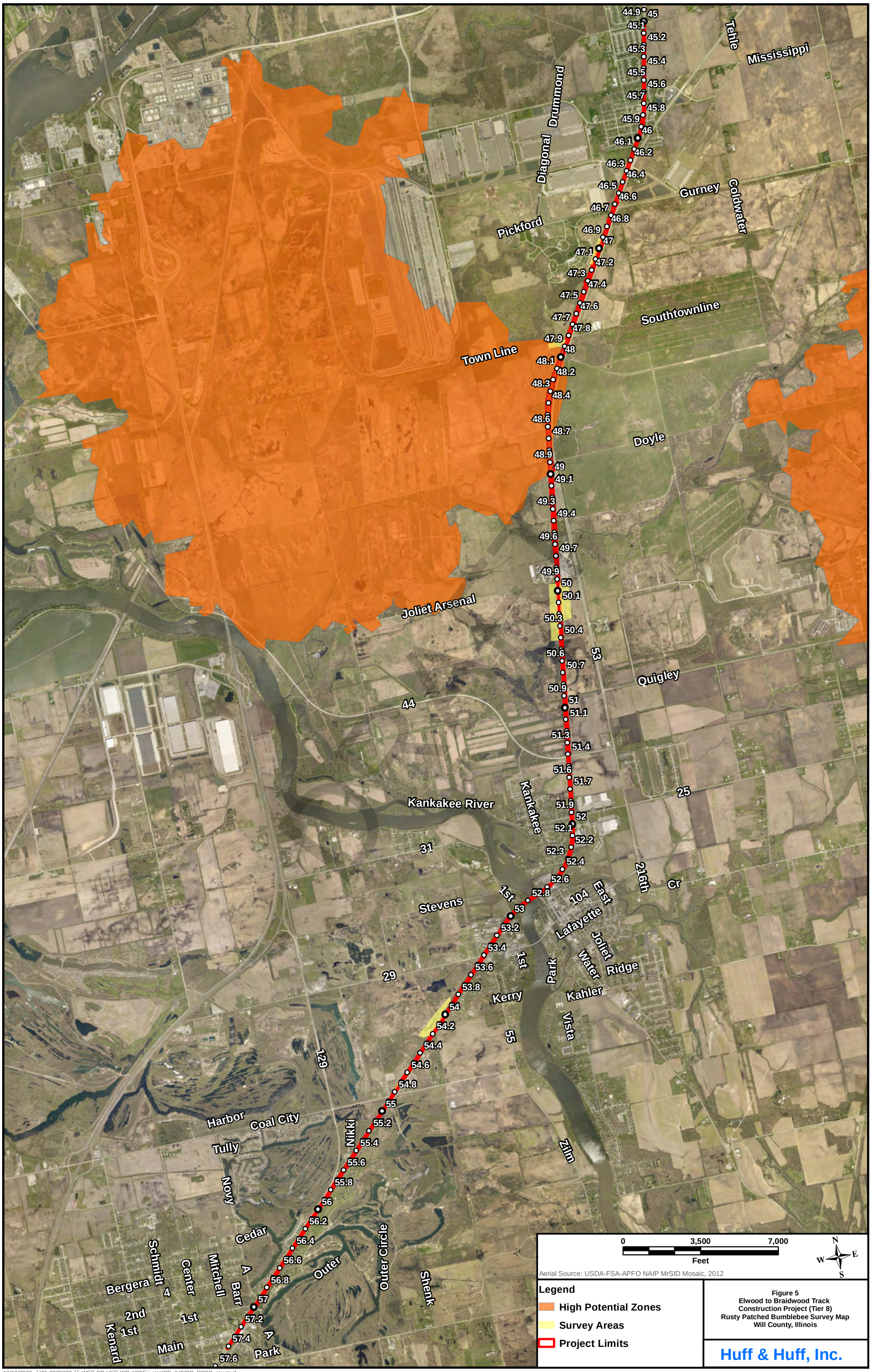
Photo 15 A relict turtle shell from an unknown species encountered during visual meander surveys.

APPENDIX F

Rusty Patched Bumble Bee Survey Map

Rusty Patched Bumble Bee Survey Photographic Log

Rusty Patched Bumble Bee Identification Summary



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Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 1 Habitat at Midewin South East (8/12/2020)

Photo 2 Habitat at Midewin South East (8/12/2020)

Photo 3 Habitat at Midewin South West (8/5/2020)

Photo 4 Habitat at Midewin South West (8/5/2020)

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 5 Habitat at Midewin North (7/30/2020)

Photo 6 Habitat at Midewin North (7/30/2020)

Photo 7 Habitat at Hitts Siding Prairie (9/3/2020)

Photo 8 Habitat at Hitts Siding Prairie (8/11/2020)

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 9 Habitat at Abraham Lincoln National Cemetery (7/30/2020)

Photo 10 Habitat at Midewin North (8/6/2020)

Photo 11 Pennsylvania Bumble Bee (*Bombus pensylvanica*) Midewin North 8/6/2020

Photo 12 Black & Gold Bumble Bee (*Bombus auricomus*) nest at Abraham Lincoln National Cemetery (7/30/2020)

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 13 Eastern Bumble Bee (*Bombus impatiens*), Midewin North (8/6/20)

Photo 14 Eastern Bumble Bee at Hitts Siding Prairie (8/7/2020)

Photo 15 Brown-belted Bumble Bee (*Bombus griceocollis*) worker, Midewin North (8/7/20)

Photo 16 Brown-belted Bumble Bee at Hitts Siding Prairie (8/11/20)

Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 17 Brown-belted Bumble Bee at Midewin South East (8/16/2020)

Photo 18 Variable Cuckoo Bee (*Bombus variabilis*), Midewin North (8/19/20)

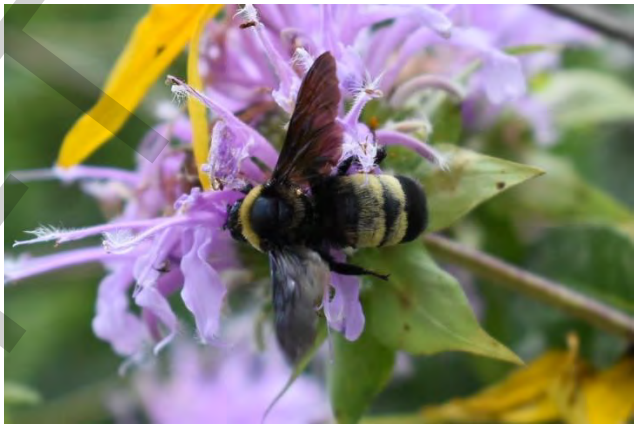
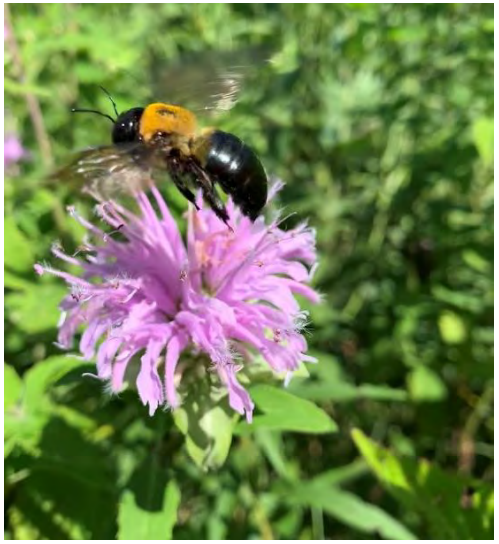


Photo 19 Half-backed Bumble Bee (*Bombus vagans*) at Hitts Siding Prairie (8/29/2020). ID is based on compact bee with complete thorax, yellow hair between eyes T1 and T2.

Photo 20 Carpenter Bee (*Xylocopa virginica*) at Midwin South West (7/28/20)



Client Name: WSP USA, Inc.	**Site Location:** High Speed Rail Corridor	**Project No.** 81.0220288.15

Photo 21 Eastern Bumble Bee nest at Midewin South West (7/28/2020)

Photo 22 Half-backed Bumble Bee (*Bombus vagans*) 7/30/2020

Photo 23 Half-backed Bumble Bee (*Bombus vagans*) 7/30/2020

Photo 24 Eastern Bumble Bee at Midewin North.

Rusty Patched Bumble Bee

Photographic Survey – Bee Identification Summary

August 2020

Note:

Bumble Bee means a species photographed (including carpenter bee/ often confused) by the surveyor that Blaine Rothauser could Key to the species level to confirm presence of species at that site on that day at the site indicated by code – the definitive species photographed are included in the Photographic Log. All bees are workers unless otherwise specified.

Site	Date	Bumble Bee ID'd to Species	General Abundance	Notes
MSW	7.28.2020	*Xylocopa virginica*	Abundant	Not a Bombid
MSW	7.28.2020	*Bombus impatiens*	Abundant	Image from Nest
MSW	7.30.2020	*Bombus vagans*	Uncommon	Face geometry, Yellow hairs T2, Thorax spot, General hair pattern all fit
MSW	7.30.2020	*Bombus griceocollis*	Common	Facial geometry T1 and T2 yellow with brown band worker
MSW	8.6.2020	*Bombus fervidus*	Uncommon	On pink flower (?)
MSW	8.6.2020	*Bombus auricomus*	Uncommon	On *Monarda f. lateral shot*
MSW	8.19.2020	*Bombus impatiens*	Common	Most common BB seen this day
MSE	8.5.2020	*Bombus Impatiens*	Common	Dorsal shot diagnostic
MSE	8.16.2020	*Bombus griceocollis*	Common	On swamp milkweed
Lincoln Cemetery	7.30.2020	*Bombus auricomus*	Uncommon	Under electric box in nest along parking lot Road
Lincoln Cemetery	7.30.2020	*Bombus griceocollis*	Common	Facial geometry T1 and T2 yellow with brown band worker Males perched and territorializing
Lincoln Cemetery	8.11.20	*Bombus impatiens*	Common	On Almost anything with a large flower
MNN	8.6.2020	*Bombus pensylvanicus*	Uncommon	Lateral shot diagnostic
MNN	8.6.2020	*Bombus impatiens*	Abundant	Dorsal shot
MNN	8.11.2020	*Bombus griceocollis*	Abundant	Lateral Shot on Swamp Milkweed
MNN	8.13.2020	*Bombus pensylvanicus*	Uncommon	On Monarda
MNN	8.19.2020	*Bombus variabilis*	Uncommon	*On Monarda fistulosa*
ALNC	8.11.2020	*Bombus impatiens*	Abundant	Frontal Shot
HSP	8.11.2020	*Bombus griceocollis*	Abundant	Face shot showing head disc geometry
HSP	8.11.2020	*Bombus pensylvanicus*	Uncommon	Nectaring on *Monarda fistulosa*
HSP	8.11.2020	*Bombus impatiens*	Common	Dominant BB
HSP	8.29.20	*Bombus vagans (?)*	Uncommon	On Sunflower Disc

APPENDIX G

Regional Forester Sensitive Species

Midewin National Tallgrass Prairie
Regional Forester Sensitive Species

Plants				
Scientific Name	**Common name**	**Habitat**	**Habitat Present in Corridor?**	**Surveyed**
Agalinis auriculata	Earleaf false foxglove	Prefers habitats with ample sunlight, well-drained soils, and moderate moisture levels, open woodlands, prairies, and along the edges of wetlands or marshes.	Yes; Throughout corridor including Midewin and Hitts Siding Nature Preserve	H&H 2024 surveys
Bagliettoa marmorea	Wart lichen	Wart Lichen tends to prefer environments with a significant amount of tree cover, such as forests and woodlands. It commonly grows on the bark of trees, especially deciduous species like oak, maple, hickory, and beech. Also prefers areas of higher humidity or rainfall (i.e. floodplains),	Limited	No
Cirsium hillii	Hill's thistle	Primarily found in prairies and savannas, particularly those with calcareous or alkaline soils or thin soil over limestone bedrock.	Yes; Throughout corridor including Midewin and Hitts Siding Nature Preserve (potentially dependent on soil conditions)	No
Cypripedium candidum	Small white lady's slipper	Typically occurs in moist, sunny meadows, prairies, fens, limestone barrens, and forest edges. This plant prefers calcium-rich soils, often found in limestone-rich areas. These soils are typically well-drained and slightly alkaline. Can be found in areas with a moderate amount of moisture, such as near streams, seeps, or in low-lying areas where water accumulates.	Limited	H&H 2024 surveys
Festuca paradoxa	Cluster fescue	Primarily found in wet meadows, prairies, open grasslands, and open woods where it can receive ample sunlight. Cluster fescue prefers habitats with well-drained soils and dry to mesic conditions	Yes; Throughout corridor including Midewin and Hitts Siding Nature Preserve	H&H 2024 surveys
Gratiola quartermaniae	Quarterman's hedge-hyssop	Typically associated with wetland habitats, including marshes, swamps, and wet meadows. It often grows in areas with limestone or dolomite.	Limestone and dolomite wetlands are not present within the project limits.	H&H 2020 surveys

Hydrastis canadensis	Goldenseal	Often found in mesic deciduous forests woodlands, woodland edges, and woodland paths where it grows in the rich, moist soils beneath the canopy of trees. It prefers habitats with a moderate amount of shade, particularly in the understory of forests and with rich, well-drained soils that are moist but not waterlogged. It commonly grows in areas with loamy or sandy soils that have good drainage and retain moisture well.	Limited	H&H 2024 surveys
Isoetes butleri	Butler's quillwort	The habitat of calcareous soils over shallow limestone is not present adjacent to the railroad tracks within the project limits.	No	H&H 2024 surveys
Malvastrum hispidum	Hispid false mallow	Found in open, disturbed habitats, including roadsides, prairies, fields, pastures, and other areas with disturbed soils. It can also colonize abandoned agricultural fields, construction sites, and other areas where the soil has been disturbed. It commonly grows in limestone and dolomite outcrops and shallow soil. It is often found in habitats with variable moisture levels, including areas that experience periodic drought or occasional flooding	Yes, Throughout corridor.	H&H 2024 surveys
Minuartia patula	Pitcher's stitchwort	Often found in habitats including barrens, limestone glades and bluffs with shallow soil (limestone near the surface).	Some areas present throughout corridor, including Midewin and Hitts Sidding Prairie (Potentially dependent on compision/sandiness of soil),	H&H 2024 surveys
Panax quinquefolius	American ginseng	Often found in mesic deciduous forests and woodlands, where it grows in the rich, moist soils beneath the canopy of trees. Typically these woodlands are high quality and little – disturbed. It prefers habitats with a moderate amount of shade, particularly in the understory of forests and with rich, well-drained soils with abundant organic matter	Limited	No

Sanguisorba canadensis	Canada burnet	Often found in wetland habitats, including wet to moist prairies, primarily along railroads. It can also be found in low areas such as rivers, bogs, fens and swamps. It can tolerate periodic flooding and often grows in areas with seasonally saturated soils. It commonly grows in areas where the water table is close to the surface or where there is periodic inundation, such as in floodplains or low-lying areas and can tolerate some shade, it generally prefers habitats with full sunlight exposure	Yes; Throughout corridor including Midewin and Hitts Sidding Prairie	No
Silene regia	Royal catchfly	Often found in native prairies, open grasslands, and meadows. These habitats typically feature well-drained soils and plenty of sunlight. Can tolerate a range of soil moisture levels, from dry to moderately moist. It is often found in habitats with well-drained soils, including sandy or loamy soils, although it can also tolerate clay soils to some extent	Yes; Throughout corridor including Midewin and Hitts Sidding Prairie	H&H 2024 surveys
Valeriana edulis var ciliata	Hairy valerian	Often found in fens, native prairies, open grasslands, and meadows, and can be found in railroad right-of-ways. These habitats typically have well-drained soils and receive ample sunlight. This species prefers habitats with moist to wet soils. It is commonly found in areas with sufficient moisture, such as moist microsites in rocky soil, wet meadows, and low-lying areas that retain moisture and can tolerate a range of light conditions, from full sunlight to partial shade. However, it typically grows best in habitats with ample sunlight exposure.	Yes, Throughout corridor including Midewin and Hitts Sidding Prairie	No
Valerianella umbilicata	Naval corn salad	Often found in open habitats such as fields, meadows, grasslands, and disturbed areas. It can also grow in agricultural fields, gardens, and along roadsides. It prefers habitats with moderately moist to mesic (moderately wet) soils. It can tolerate a range of soil types, including loamy, sandy, or clayey soils, as long as they are well-drained and can grow in a variety of light conditions, from partial shade to full sunlight. (Hilty, 2020).	Yes: Throughout corridor	No

Birds

Scientific Name	Common name	Habitat	Habitat Present in Corridor?	Surveyed
Also flammeus	Short eared owl	Often found in open grasslands, including prairies, fields, and agricultural areas. They prefer habitats with low vegetation cover. Also frequent marshes and wetlands, especially those with tall grasses and reeds.	Yes; Throughout corridor including Midewin and Hitts Sidding Prairie	No
Bartramia longicauda	Upland sandpiper	Often found in open grasslands and prairies. They prefer habitats with short to medium-height vegetation where they can easily spot prey and have clear visibility for their distinctive aerial displays during the breeding season. Will also utilize pastures and agricultural fields. These habitats often provide suitable foraging opportunities for insects and other invertebrates, which are the primary food source for these birds. They generally avoid densely wooded areas.	Yes; Throughout corridor including Midewin and Hitts Sidding Prairie	Yes; Included in avian surveys preformed by H&H in 2020
Botaurus lentiginosus	American bittern	Primarily associated with freshwater marshes, including both emergent and open water marsh habitats. They prefer marshes with dense vegetation, such as cattails, reeds, and other tall grasses, which provide cover for hunting and nesting. Also inhabit wetlands and swamps, especially those with a mix of shallow water, mudflats, and vegetated	Yes; Throughout corridor including Midewin and Hitts Sidding Prairie	No: Secretive marsh birds were not included during 2020 avian surveys
Circus cyaneus	Northern harrier	Often found in open grassland habitats, including prairies, meadows, grassy fields, and agricultural lands. They prefer habitats with low vegetation cover, which provides them with clear visibility for hunting. Also frequent wetland and marsh habitats. Typically nest on the ground in grassy or marshy areas, often using existing depressions or tall vegetation for concealment	Yes; Throughout corridor including Midewin and Hitts Sidding Prairie	No; Informally included during H&H 2020 surveys

Coccyzus erythropthalmus	Black billed cuckoo	Primarily associated with woodlands, including deciduous forests, mixed woodlands, and forest edges. They prefer habitats with dense vegetation and a variety of tree species, providing ample cover for nesting and foraging. May also inhabit shrublands, thickets, and brushy areas, especially those adjacent to forested habitats. Often found in riparian habitats, including streamside forests, riverine woodlands, and wetland edges. These habitats provide water sources and may support abundant insect populations, which are an important food source for cuckoos and their nestlings.	Yes; Throughout corridor including Midewin and Hitts Sidding Prairie	No; Informally included during H&H 2020 surveys
Dolichonyx oryzivorus	Bobolink	Primarily associated with grassland habitats, including native prairies, grassy meadows, pastures, and hayfields. They prefer habitats with tall, dense vegetation for nesting and foraging, especially those with a diverse structure and plant composition. They often select sites with taller vegetation for nesting and shorter vegetation for foraging. may also utilize wetter habitats such as wet meadows, marshes, and fen habitats. These areas provide additional foraging opportunities and may support a higher abundance of insects, which are an important food source for Bobolinks and their nestlings.	Yes; Throughout corridor including Midewin and Hitts Sidding Prairie	No; Informally included during H&H 2020 surveys
Haliaeetus leucocephalus	Bald eagle	Commonly associated with large bodies of water, including rivers, lakes, reservoirs, and coastal areas. These water bodies provide abundant fish, waterfowl, and other prey species that Bald Eagles rely on for food. While Bald Eagles primarily forage over water bodies, they often roost and nest in forested areas adjacent to their preferred water habitats. These forests provide suitable nesting sites, such as large trees near the water's edge, as well as cover and protection for the eagles. They may utilize open grasslands, marshes, and agricultural fields adjacent to water bodies for hunting opportunities	Some varied habitat throughout the corridor, especially around the Kankakee River	No; Raptor surveys were informally conducted during H&H 2020 surveys

Ixobrychus exilis	Least bittern	Primarily associated with freshwater and brackish marshes, wetlands, and swampy areas. They prefer habitats with dense emergent vegetation, such as cattails, reeds, and bulrushes, which provide cover for foraging and nesting. Least Bitterns forage in shallow water habitats, including marshes, ponds, wet meadows, and flooded fields. Cattail marshes are particularly important habitats for Least Bitterns, as they provide suitable nesting sites and abundant prey resources. Least Bitterns often construct their nests among the dense stands of cattails, using the vegetation for concealment and protection. May also inhabit riparian areas along rivers, streams, and creeks, especially those with dense vegetation and wetland features.	Yes; Throughout corridor including Midewin and Hitts Sidding Prairie	No: Secretive marsh bird survey were not conducted during 2020 avian surveys
Lanius ludovicianus migrans	Migrant loggerhead shrike	Commonly associated with open habitats such as grasslands, pastures, meadows, and agricultural fields. They prefer areas with short vegetation and scattered shrubs or trees, which provide perching sites for hunting. Loggerhead Shrikes are often found in edge habitats where different habitat types meet, such as the interface between grasslands and forests, or grasslands and agricultural fields. May inhabit shrublands, scrublands, and brushy areas, especially those with scattered trees or thorny shrubs. are frequently observed along roadsides, fencerows, and utility lines, where they perch and scan for prey. These linear features provide open spaces for hunting and may also offer nesting sites.	Yes; Throughout corridor including Midewin and Hitts Sidding Prairie	Yes; Included in avian surveys preformed by H&H in 2020

Melanerpes erythrocephalus	Red headed woodpecker	Are commonly associated with deciduous forests, including oak-hickory woodlands, beech-maple forests, and bottomland hardwood forests. They prefer mature forests with a mix of tree species and various age classes, providing ample foraging and nesting opportunities. In addition to dense forests, Red-headed Woodpeckers also inhabit open woodlands, savannas, and parkland areas with scattered trees. Are often found in edge habitats where forests meet open areas, such as forest edges, woodland clearings, and forested riparian corridors. Red-headed Woodpeckers are cavity nesters and rely on dead trees (snags) for nesting sites. They excavate nest cavities in dead or dying trees, as well as in artificial structures such as utility poles and nest boxes.	Forested habitats limited throughout corridor. Some edge habitats might be suitable.	No
Rallus elegans	King rail	Are primarily associated with freshwater marshes, including emergent marshes, wet meadows, and flooded grasslands. They prefer habitats with dense vegetation, such as cattails, bulrushes, sedges, and other emergent aquatic plants. May also inhabit other types of wetlands and swamps, including forested swamps, shrub swamps, and shallow marshy areas with standing water. May utilize riparian habitats along rivers, streams, and creeks, especially those with dense vegetation and wetland features. Riparian areas adjacent to marshes and wetlands provide additional foraging opportunities and potential nesting sites. Typically build their nests on the ground among dense vegetation, often using tussocks, clumps of grass, or thickets for concealment.	Yes; Throughout corridor including Midewin and Hitts Sidding Prairie	No: Secretive marsh bird survey were not conducted during 2020 avian surveys

Setophaga cerulea	Cerulean warbler	Prefer mature deciduous forests with a closed canopy, characterized by a diverse mix of tree species, including oaks, hickories, maples, and beeches. They are particularly associated with tall, intact forest stands. Forests with a diverse vertical structure, including multiple canopy layers, understory vegetation, and dense shrubbery, are preferred by Cerulean Warblers. This complexity provides nesting sites, foraging opportunities, and cover from predators. s are often found in association with streamside or riparian forests, where they utilize the adjacent forest habitat for nesting and foraging. These areas provide additional habitat diversity and may support higher densities of insects, a primary food source for Cerulean Warblers	Mature forest habitat for breeding is limited throughout corridor. Foraging or migratory stop over habitat is likely present.	No

Invertebrates

Scientific Name	Common name	Habitat	Habitat Present in Corridor?	Surveyed
Aflexia rubranura	Red tailed leafhopper	Commonly associated with grassland and prairie habitats. They can be found in both remnant prairies and restored grasslands throughout Illinois. Particularly abundant in tallgrass prairies, characterized by a diverse mix of grasses and wildflowers.	Yes; Throughout corridor including Midewin and Hitts Sidding Prairie	No
Danaus plexippus	Monarch butterfly	Monarch butterflies breed in a variety of habitats, but they are particularly reliant on milkweed plants (*Asclepia* s spp.) for egg-laying and larval development. onarchs seek out milkweed habitats for breeding, including open fields, roadsides, meadows, prairies, and gardens. Monarchs rely on a diverse array of flowering plants for nectar, including native wildflowers, garden flowers, and agricultural crops such as clover and goldenrod.	Yes; Throughout corridor including Midewin and Hitts Sidding Prairie	No
Dannella lita	A mayfly			

Deltocephalus gnarum	A leafhopper	Commonly found in grassy areas such as meadows, pastures, and grasslands. Often found in agricultural fields, including crops like cereals, soybeans, alfalfa, and various vegetables. hey may also inhabit weedy areas, roadside vegetation, and abandoned fields where there is an abundance of plant hosts for feeding. While they primarily inhabit open areas, they can also be found at the edges of woodlands and forests, especially if there is adjacent vegetation suitable for their feeding habits. May occur in gardens and landscapes where there is a variety of plants that serve as hosts for feeding.	Yes; Throughout corridor including Midewin and Hitts Sidding Prairie	No
Dichagyris reliqua	A noctuid moth	inhabit diverse habitats, including forests, grasslands, wetlands, agricultural areas, and urban environments. They can adapt to a wide range of environmental conditions. Use Prairie dropseed as host for larvae.	Yes	No
Macrosteles potorius	Aster leafhopper	Commonly found in open habitats such as meadows, grasslands, prairies, and agricultural fields. Feed on a variety of plants, including various species of asters, as their name suggests. They may also feed on other herbaceous plants and grasses, depending on availability. Are often found in agricultural settings, where they can be both pests and beneficial insects. They may feed on crops such as alfalfa, soybeans, and various vegetables, but they also play a role in natural pest control by preying on other insect pests. May inhabit weedy areas, roadside vegetation, and abandoned fields where there is an abundance of host plants for feeding.	Yes; Throughout corridor including Midewin and Hitts Sidding Prairie	No
Oncocnemis saundersiana	A noctuid moth	Inhabit a wide range of habitats, including forests, grasslands, wetlands, and urban environments. They are often found in areas with diverse vegetation. Uses Hairy Penstamon as host for larvae.	Yes; Throughout corridor including Midewin and Hitts Sidding Prairie	No

Papaipema beeriana	Blazing star stem borer moth	Wet and wet-mesic prairie. In Illinois, Papaipema beeriana is associated with moderately disturbed to relatively undisturbed prairie. Papaipema beeriana larvae rely on blazing stars (Liatris spp.) as its requisite host plant. Marsh blazing star (Liatris spicata) is the preferred host species. Liatris aspera isn't used and it's unknown if Liatris pycnostachya is used. Blazing star is it's only known larval host	Yes; Throughout corridor including Midewin and Hitts Sidding Prairie	No
Papaipema eryngii	Rattlesnake master borer mot	Primarily found in prairies, grasslands, and savannas where its host plant, Rattlesnake Master, occurs naturally or has been planted. refers habitats ranging from dry to mesic (moderately moist) conditions. These habitats typically have well-drained soils and are characterized by a mix of grasses, wildflowers, and other herbaceous plants. The presence of Rattlesnake Master plants is essential for the survival and reproduction of the Rattlesnake Master Borer Moth. These plants are members of the carrot family (Apiaceae) and are typically found in prairies and open woodlands.	Yes; Throughout corridor including Midewin and Hitts Sidding Prairie	Yes, Rattlesnake Master plants documented in 2020 surveys
Plusia venusta	White streaked looper moth	Can inhabit a variety of habitats, including forests, woodlands, grasslands, meadows, and urban areas. he larvae of White-streaked Looper Moths feed on a wide range of herbaceous plants and shrubs. They are known to consume leaves, buds, and flowers of various host plants, including garden vegetables, ornamental plants, and weeds.	Yes; Throughout corridor including Midewin and Hitts Sidding Prairie	No
Sphinx luscitiosa	Clemen's sphinx	Can inhabit a variety of habitats, including forests, woodlands, meadows, grasslands, and urban areas. The larvae of the Canadian Sphinx feed primarily on plants in the grape family (Vitaceae), including grapes (genus Vitis) and Virginia creeper (Parthenocissus quinquefolia). Therefore, suitable habitat for the Canadian Sphinx should include these host plants. Willow and Poplar trees may also be utilized.	Yes; Throughout corridor including Midewin and Hitts Sidding Prairie	No

Vernustaconcha ellipsiformis	Ellipse	Typically found in rivers and streams, preferring habitats with clean, flowing water. They inhabit both large rivers and smaller streams throughout Illinois. They prefer sandy or gravelly substrates where they can burrow and anchor themselves. Clean water with good oxygen levels is essential for the survival of Ellipse Mussels. They are sensitive to pollution, sedimentation, and other forms of habitat degradation. Ellipse Mussels are adapted to habitats with a natural flow regime. They require periodic flooding and water movement for dispersal of their larvae (glochidia) and to maintain suitable habitat conditions. Ellipse Mussels are filter feeders, meaning they extract organic particles and plankton from the water column. They rely on a steady supply of suspended particles for nutrition. Ellipse Mussels are filter feeders, meaning they extract organic particles and plankton from the water column. They rely on a steady supply of suspended particles for nutrition.	Limited habitat particularly within the Kankakee River.	No

Mammals

Scientific Name	Common name	Habitat	Habitat Present in Corridor?	Surveyed
Spermophilus franklinii	Franklin's ground squirrel	Commonly associated with open prairie habitats, including tallgrass prairies, mixed-grass prairies, and prairie remnants. In addition to prairie habitats, Franklin's Ground Squirrels may also inhabit grasslands, meadows, and open fields with short vegetation. They prefer areas with sparse shrubs and scattered trees, as they rely on open spaces for foraging and predator detection. They dig burrows in well-drained soils, often with multiple entrances and chambers for different purposes. May utilize edge habitats where different habitat types meet, such as the interface between grasslands and woodlands or agricultural fields.	Yes; Throughout corridor	No
Myotis lucifugus	Little brown bat	Habitat includes caves, mines, trees, attics, bat houses, and under rocks. In the winter, they hibernate in caves and abandoned mines. In the summer, they roost in trees, artificial structures, and bat houses	Some varied habitat throughout the corridor, especially within forested areas.	No

Eptesicus fuscus	Big brown bat	Big brown bats roost in buildings, such as houses, barns, bridges, and other man-made structures. They may also roost in natural features such as tree cavities, rock crevices, and hollow logs. They forage in a wide range of habitats, including urban areas, agricultural fields, forests, and along water bodies. There is a preference for foraging near bodies of water including streams, rivers, lakes and ponds. During the winter months, big brown bats hibernate in caves, mines, tunnels, and other underground structures with stable temperatures and humidity levels. They may form large hibernation colonies with other bat species.	Some varied habitat throughout the corridor, especially within forested areas.	No

Reptiles and Amphibians

Scientific Name	Common name	Habitat	Habitat Present in Corridor?	Surveyed
Rana blairi	Plains leopard frog	Habitat includes prairie wetlands, including temporary and permanent ponds, marshes, and shallow, slow-moving streams. They prefer habitats with emergent vegetation, such as cattails, bulrushes, and sedges, which provide cover and breeding sites. May also inhabit adjacent grassland habitats, including tallgrass prairies, savannas, and grassy meadows for foraging and dispersal. Suitable habitat should have relatively stable water levels, adequate dissolved oxygen, and minimal contamination from pollutants such as pesticides and fertilizers. Breeding sites for Plains Leopard Frogs typically include shallow, vegetated bodies of water where they lay their eggs.	Yes; Throughout corridor including Midewin and Hitts Sidding Prairie	No

Emydoidea blandingii	Blanding's turtle	Typically found in wetland habitats such as marshes, swamps, fens, and wet prairies. They prefer habitats with shallow, slow-moving water and plenty of emergent vegetation for basking and nesting. May also inhabit ponds and lakes within or adjacent to wetland complexes. May venture into adjacent grassy meadows and fields, especially during the nesting season. They may travel overland between wetland habitats, particularly females seeking suitable nesting sites. Sandy or gravelly areas are preferred nesting sites, digging shallow nests in well-drained soil to deposit their eggs. These areas are often located adjacent to wetlands or within upland habitats near water bodies. They prefer habitats with plenty of cover and refuge options, including dense vegetation, fallen logs, and submerged aquatic vegetation.	Yes; Throughout corridor including Midewin and Hitts Sidding Prairie	Yes; Included in turtle surveys preformed by H&H in 2020

APPENDIX H

Bridge Bat Assessments

APPENDIX D: Bridge/Structure Bat Assessment Form

Bridge/Structure Bat Assessment Form Instructions

- This form will be completed to document bat occupancy or bat use of bridges, culverts, and other structures. This form shall be submitted to the appropriate personnel within the DOT and USFWS for recordkeeping (or uploaded into the Information, Planning, and Consultation (IPaC) Determination Key for use of the Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat) prior to conducting: any activities below the deck surface either from the underside or from above the deck surface that bore down to the underside; any activities that could impact expansion joints; any activities involving deck removal on bridges; or any activities involving structure demolition for bridges, culverts, and/or other structures.
- Assessments must be completed within two (2) years of conducting any work (see the above bullet), regardless of whether assessments have been conducted in the past. Assessments must be completed in appropriate weather conditions, suitable for the assessor to observe common signs of bat use.
- Evidence of bat use may include visual observation (live and/or dead), presence of guano, presence of staining, audible observation, and/or odor observation. Presence of one or more indicators is sufficient evidence that bats may be using the bridge, culvert, and/or other structure.
- If bat use of a bridge, culvert, and/or other structure is noted, additional studies may be undertaken during bat active season to identify the specific bat species utilizing the structure, or protected bat species presence can be assumed, in order to comply with threatened and endangered species regulations. Bat active season dates, typically between April and November, vary regionally and by species, so assessors should consult with their local USFWS Field Office for more specific active season dates.
- For use of the Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat – If the bridge/structure is 1,000 feet or more from suitable bat habitat[1] (e.g., an urban or agricultural area without suitable foraging habitat or corridors linking the bridge to suitable foraging habitat), check the appropriate box and fill out the table below. **No further assessment is required.**

Date & Time of Assessment 2/15/2024 12:45 PM	**DOT Project #**	**Route/Facility Carried** Perpendicular with UPRR (Springfield to Chicago) at Mile Post 46.7.	**County** Will
Federal Structure ID	**Structure Coordinates** (latitude and longitude) 41.391869, -88.117835	☐ This bridge/structure is 1,000 feet or more from suitable bat habitat[2] Name: Michael Jochheim Signature:	

- Any questions pertaining to assessments or this form should be directed to the local USFWS Field Office.

[1] Refer to the USFWS's summer survey guidance for the definition of suitable habitat (http://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html).

[2] This condition is only for use of the Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat

Bridge/Structure Bat Assessment Form

Date & Time of Assessment: 2/15/2024 12:45 PM	DOT Project Number:	Route/Facility Carried: Perpendicular with UPRR (Springfield to Chicago) at Mile Post 46 7	County: Will
Federal Structure ID:	Structure Coordinates (latitude and longitude): 41 391869, -88 117835	Structure Height (approximate): 4.5	Structure Length: 84

Structure Type (check one)

Bridge Construction Style

○ Cast-in-place		○ Pre-stressed Girder	
○ Flat Slab/Box		○ Steel I-beam	
○ Truss	Side View	○ Covered	
○ Parallel Box Beam		○ Other:	

Culvert Type

- ○ Box
- ⊙ Pipe/Round
- ○ Other:

Other Structure

- ○

Structure Material (check all that apply)

Deck Material	*Beam Material*	*End/Back Wall Material*
☐ Metal	☐ None	☐ Concrete
☐ Concrete	☐ Concrete	☐ Timber
☐ Timber	☐ Steel	☐ Stone/Masonry
☐ Open grid	☐ Timber	☐ Other:
☐ Other:	☐ Other:	

Creosote Evidence

- ○ Yes ○ No
- ○ Unknown

Culvert Material

- ☐ Metal
- ☒ Concrete
- ☐ Plastic
- ☐ Stone/Masonry
- ☐ Other:

Notes:

Crossings Traversed (check all that apply)

☐ Bare ground	☐ Open vegetation
☐ Rip-rap	☐ Closed vegetation
☒ Flowing water	☒ Railroad
☐ Standing water	☐ Road/trail - Type:
☐ Seasonal water	☐ Other:

Surrounding Habitat (check all that apply)

☒ Agricultural	☒ Grassland
☒ Commercial	☐ Ranching
☐ Residential-urban	☐ Riparian/wetland
☐ Residential-rural	☐ Mixed use
☐ Woodland/forested	☐ Other:

Areas Assessed (check all that apply)

Check all areas that apply. If an area is not present in the structure, check the "not present" box.
Document all bat indicators observed during the assessment. Include the species present, if known, and provide photo documentation as indicated.

Area (check if assessed)	Assessment Notes	Evidence of Bats (include photos if present)
☐ All crevices and cracks: **Bridges/culverts:** rough surfaces or imperfections in concrete **Other structures:** soffits, rafters, attic areas	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☒ Concrete surfaces (open roosting on concrete)	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☒ Spaces between concrete end walls and the bridge deck	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Crack between concrete railings on top of the bridge deck (Gap, Railing)	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Vertical surfaces on concrete I-beams	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☒ Spaces between walls, ceiling joists	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☒ Weep holes, scupper drains, and inlets/pipes	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ All guiderails	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ All expansion joints	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species

Name: Michael Jochheim

Signature:

APPENDIX D: Bridge/Structure Bat Assessment Form

Bridge/Structure Bat Assessment Form Instructions

- This form will be completed to document bat occupancy or bat use of bridges, culverts, and other structures. This form shall be submitted to the appropriate personnel within the DOT and USFWS for recordkeeping (or uploaded into the Information, Planning, and Consultation (IPaC) Determination Key for use of the Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat) prior to conducting: any activities below the deck surface either from the underside or from above the deck surface that bore down to the underside; any activities that could impact expansion joints; any activities involving deck removal on bridges; or any activities involving structure demolition for bridges, culverts, and/or other structures.
- Assessments must be completed within two (2) years of conducting any work (see the above bullet), regardless of whether assessments have been conducted in the past. Assessments must be completed in appropriate weather conditions, suitable for the assessor to observe common signs of bat use.
- Evidence of bat use may include visual observation (live and/or dead), presence of guano, presence of staining, audible observation, and/or odor observation. Presence of one or more indicators is sufficient evidence that bats may be using the bridge, culvert, and/or other structure.
- If bat use of a bridge, culvert, and/or other structure is noted, additional studies may be undertaken during bat active season to identify the specific bat species utilizing the structure, or protected bat species presence can be assumed, in order to comply with threatened and endangered species regulations. Bat active season dates, typically between April and November, vary regionally and by species, so assessors should consult with their local USFWS Field Office for more specific active season dates.
- For use of the Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat – If the bridge/structure is 1,000 feet or more from suitable bat habitat[1] (e.g., an urban or agricultural area without suitable foraging habitat or corridors linking the bridge to suitable foraging habitat), check the appropriate box and fill out the table below. **No further assessment is required.**

Date & Time of Assessment 2/15/2024 12:00 PM	**DOT Project #**	**Route/Facility Carried** Perpendicular with UPRR (Springfield to Chicago) at Mile Post 47.3.	**County** Will
Federal Structure ID	**Structure Coordinates** (latitude and longitude) 41.384907, -88.123125	☐ This bridge/structure is 1,000 feet or more from suitable bat habitat[2] Name: Michael Jochheim Signature:	

- Any questions pertaining to assessments or this form should be directed to the local USFWS Field Office.

[1] Refer to the USFWS's summer survey guidance for the definition of suitable habitat (http://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html).

[2] This condition is only for use of the Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat

Bridge/Structure Bat Assessment Form

Date & Time of Assessment 2/15/2024 12:00 PM	DOT Project Number	Route/Facility Carried Perpendicular with UPRR (Springfield to Chicago) at Mile Post 47 3	County Will
Federal Structure ID	Structure Coordinates (latitude and longitude) 41 384907, -88 123125	Structure Height (approximate) 7	Structure Length 96

Structure Type (check one)

Bridge Construction Style

- ○ Cast-in-place
- ○ Flat Slab/Box
- ○ Truss (Side View)
- ○ Parallel Box Beam
- ○ Pre-stressed Girder
- ○ Steel I-beam
- ○ Covered
- ○ Other:

Culvert Type

- ○ Box
- ◉ Pipe/Round
- ○ Other:

Other Structure

- ○

Structure Material (check all that apply)

Deck Material	*Beam Material*	*End/Back Wall Material*
☐ Metal	☐ None	☐ Concrete
☐ Concrete	☐ Concrete	☐ Timber
☐ Timber	☐ Steel	☐ Stone/Masonry
☐ Open grid	☐ Timber	☐ Other:
☐ Other:	☐ Other:	

Creosote Evidence

- ○ Yes ◉ No
- ○ Unknown

Culvert Material

- ☐ Metal
- ☒ Concrete
- ☐ Plastic
- ☐ Stone/Masonry
- ☐ Other:

Notes:

Crossings Traversed (check all that apply)

☐ Bare ground	☐ Open vegetation
☐ Rip-rap	☐ Closed vegetation
☒ Flowing water	☒ Railroad
☐ Standing water	☐ Road/trail - Type:
☐ Seasonal water	☐ Other:

Surrounding Habitat (check all that apply)

☒ Agricultural	☒ Grassland
☐ Commercial	☐ Ranching
☐ Residential-urban	☒ Riparian/wetland
☐ Residential-rural	☐ Mixed use
☒ Woodland/forested	☐ Other:

Areas Assessed (check all that apply)

Check all areas that apply. If an area is not present in the structure, check the "not present" box.
Document all bat indicators observed during the assessment. Include the species present, if known, and provide photo documentation as indicated.

Area (check if assessed)	Assessment Notes	Evidence of Bats (include photos if present)
☒ All crevices and cracks: **Bridges/culverts:** rough surfaces or imperfections in concrete **Other structures:** soffits, rafters, attic areas	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☒ Concrete surfaces (open roosting on concrete)	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☒ Spaces between concrete end walls and the bridge deck	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Crack between concrete railings on top of the bridge deck (Gap, Railing)	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Vertical surfaces on concrete I-beams	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☒ Spaces between walls, ceiling joists	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☒ Weep holes, scupper drains, and inlets/pipes	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☒ All guiderails	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ All expansion joints	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species

Name: Michael Jochheim

Signature:

APPENDIX D: Bridge/Structure Bat Assessment Form

Bridge/Structure Bat Assessment Form Instructions

- This form will be completed to document bat occupancy or bat use of bridges, culverts, and other structures. This form shall be submitted to the appropriate personnel within the DOT and USFWS for recordkeeping (or uploaded into the Information, Planning, and Consultation (IPaC) Determination Key for use of the Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat) prior to conducting: any activities below the deck surface either from the underside or from above the deck surface that bore down to the underside; any activities that could impact expansion joints; any activities involving deck removal on bridges; or any activities involving structure demolition for bridges, culverts, and/or other structures.
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- Evidence of bat use may include visual observation (live and/or dead), presence of guano, presence of staining, audible observation, and/or odor observation. Presence of one or more indicators is sufficient evidence that bats may be using the bridge, culvert, and/or other structure.
- If bat use of a bridge, culvert, and/or other structure is noted, additional studies may be undertaken during bat active season to identify the specific bat species utilizing the structure, or protected bat species presence can be assumed, in order to comply with threatened and endangered species regulations. Bat active season dates, typically between April and November, vary regionally and by species, so assessors should consult with their local USFWS Field Office for more specific active season dates.
- For use of the Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat – If the bridge/structure is 1,000 feet or more from suitable bat habitat[1] (e.g., an urban or agricultural area without suitable foraging habitat or corridors linking the bridge to suitable foraging habitat), check the appropriate box and fill out the table below. **No further assessment is required.**

Date & Time of Assessment 2/15/2023 11:10 AM	**DOT Project #**	**Route/Facility Carried** Perpendicular to Route 53 and UPRR (Springfield to Chicago) east of Mile Post 48.8	**County** Will
Federal Structure ID	**Structure Coordinates** (latitude and longitude) 41.364845, -88.134515	☐ This bridge/structure is 1,000 feet or more from suitable bat habitat[2] Name: Michael Jochheim Signature:	

- Any questions pertaining to assessments or this form should be directed to the local USFWS Field Office.

[1] Refer to the USFWS's summer survey guidance for the definition of suitable habitat (http://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html).

[2] This condition is only for use of the Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat

Bridge/Structure Bat Assessment Form

Date & Time of Assessment 2/15/2023 11:10 AM	DOT Project Number	Route/Facility Carried Perpendicular to Route 53 and UPRR (Springfield to Chicago) east of Mile Post 48 8	County Will
Federal Structure ID	Structure Coordinates (latitude and longitude) 41.364845, -88.134515	Structure Height (approximate) 3	Structure Length 72

Structure Type (check one)

Bridge Construction Style

○ Cast-in-place		○ Pre-stressed Girder	
○ Flat Slab/Box		○ Steel I-beam	
○ Truss	Side View	○ Covered	
○ Parallel Box Beam		○ Other:	

Culvert Type

- ⊙ Box
- ○ Pipe/Round
- ○ Other:

Other Structure

- ○

Structure Material (check all that apply)

Deck Material	*Beam Material*	*End/Back Wall Material*
☐ Metal	☐ None	☐ Concrete
☐ Concrete	☐ Concrete	☐ Timber
☐ Timber	☐ Steel	☐ Stone/Masonry
☐ Open grid	☐ Timber	☐ Other:
☐ Other:	☐ Other:	

Creosote Evidence

○ Yes ⊙ No ○ Unknown

Culvert Material

- ☐ Metal
- ☒ Concrete
- ☐ Plastic
- ☐ Stone/Masonry
- ☐ Other:

Notes:

Crossings Traversed (check all that apply)

☐ Bare ground	☐ Open vegetation
☐ Rip-rap	☐ Closed vegetation
☒ Flowing water	☐ Railroad
☐ Standing water	☒ Road/trail - Type:
☐ Seasonal water	☐ Other:

Surrounding Habitat (check all that apply)

☒ Agricultural	☐ Grassland
☒ Commercial	☐ Ranching
☐ Residential-urban	☒ Riparian/wetland
☐ Residential-rural	☐ Mixed use
☐ Woodland/forested	☐ Other:

Areas Assessed (check all that apply)

Check all areas that apply. If an area is not present in the structure, check the "not present" box.
Document all bat indicators observed during the assessment. Include the species present, if known, and provide photo documentation as indicated.

Area (check if assessed)	Assessment Notes	Evidence of Bats (include photos if present)
☒ All crevices and cracks: **Bridges/culverts:** rough surfaces or imperfections in concrete **Other structures:** soffits, rafters, attic areas	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☒ Concrete surfaces (open roosting on concrete)	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☒ Spaces between concrete end walls and the bridge deck	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Crack between concrete railings on top of the bridge deck (Gap, Railing)	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Vertical surfaces on concrete I-beams	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Spaces between walls, ceiling joists	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Weep holes, scupper drains, and inlets/pipes	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☒ All guiderails	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ All expansion joints	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species

Name: Michael Jochheim

Signature:

APPENDIX D: Bridge/Structure Bat Assessment Form

Bridge/Structure Bat Assessment Form Instructions

- This form will be completed to document bat occupancy or bat use of bridges, culverts, and other structures. This form shall be submitted to the appropriate personnel within the DOT and USFWS for recordkeeping (or uploaded into the Information, Planning, and Consultation (IPaC) Determination Key for use of the Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat) prior to conducting: any activities below the deck surface either from the underside or from above the deck surface that bore down to the underside; any activities that could impact expansion joints; any activities involving deck removal on bridges; or any activities involving structure demolition for bridges, culverts, and/or other structures.
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- If bat use of a bridge, culvert, and/or other structure is noted, additional studies may be undertaken during bat active season to identify the specific bat species utilizing the structure, or protected bat species presence can be assumed, in order to comply with threatened and endangered species regulations. Bat active season dates, typically between April and November, vary regionally and by species, so assessors should consult with their local USFWS Field Office for more specific active season dates.
- For use of the Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat – If the bridge/structure is 1,000 feet or more from suitable bat habitat[1] (e.g., an urban or agricultural area without suitable foraging habitat or corridors linking the bridge to suitable foraging habitat), check the appropriate box and fill out the table below. **No further assessment is required.**

Date & Time of Assessment 02/15/2024 11:00 AM	**DOT Project #**	**Route/Facility Carried** Parallel with an unnamed tributary and perpendicular with the UPRR (Springfield to Chicago) at Mile Post 48.9	**County** Will
Federal Structure ID	**Structure Coordinates** (latitude and longitude) 41.363803, -88.134635	☐ This bridge/structure is 1,000 feet or more from suitable bat habitat[2] Name: Michael Jochheim Signature:	

- Any questions pertaining to assessments or this form should be directed to the local USFWS Field Office.

[1] Refer to the USFWS's summer survey guidance for the definition of suitable habitat (http://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html).

[2] This condition is only for use of the Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat

Bridge/Structure Bat Assessment Form

Date & Time of Assessment 02/15/2024 11:00 AM	DOT Project Number	Route/Facility Carried Parallel with an unnamed tributary and perpendicular with the UPRR (Springfield to Chicago) at Mile Post 48 9	County Will
Federal Structure ID	Structure Coordinates (latitude and longitude) 41.363803, -88.134635	Structure Height (approximate) 4	Structure Length 78

Structure Type (check one)

Bridge Construction Style

○ Cast-in-place		○ Pre-stressed Girder	
○ Flat Slab/Box		○ Steel I-beam	
○ Truss	Side View	○ Covered	
○ Parallel Box Beam		○ Other:	

Culvert Type

- ○ Box
- ⊙ Pipe/Round
- ○ Other:

Other Structure

- ○

Structure Material (check all that apply)

Deck Material	*Beam Material*	*End/Back Wall Material*
☐ Metal	☐ None	☐ Concrete
☐ Concrete	☐ Concrete	☐ Timber
☐ Timber	☐ Steel	☐ Stone/Masonry
☐ Open grid	☐ Timber	☐ Other:
☐ Other:	☐ Other:	

Creosote Evidence

- ○ Yes ⊙ No
- ○ Unknown

Culvert Material

- ☒ Metal
- ☐ Concrete
- ☐ Plastic
- ☐ Stone/Masonry
- ☐ Other:

Notes:

Crossings Traversed (check all that apply)

☐ Bare ground	☐ Open vegetation	
☐ Rip-rap	☐ Closed vegetation	
☐ Flowing water	☐ Railroad	
☐ Standing water	☒ Road/trail - Type:	
☐ Seasonal water	☐ Other:	

Surrounding Habitat (check all that apply)

☐ Agricultural	☐ Grassland
☐ Commercial	☐ Ranching
☐ Residential-urban	☐ Riparian/wetland
☐ Residential-rural	☒ Mixed use
☐ Woodland/forested	☐ Other:

Areas Assessed (check all that apply)

Check all areas that apply. If an area is not present in the structure, check the "not present" box.
Document all bat indicators observed during the assessment. Include the species present, if known, and provide photo documentation as indicated.

Area (check if assessed)	Assessment Notes	Evidence of Bats (include photos if present)
☒ All crevices and cracks: **Bridges/culverts:** rough surfaces or imperfections in concrete **Other structures:** soffits, rafters, attic areas	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Concrete surfaces (open roosting on concrete)	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Spaces between concrete end walls and the bridge deck	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Crack between concrete railings on top of the bridge deck (Gap, Railing)	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Vertical surfaces on concrete I-beams	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Spaces between walls, ceiling joists	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Weep holes, scupper drains, and inlets/pipes	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ All guiderails	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ All expansion joints	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species

Name: Michael Jochheim

Signature:

APPENDIX D: Bridge/Structure Bat Assessment Form

Bridge/Structure Bat Assessment Form Instructions

- This form will be completed to document bat occupancy or bat use of bridges, culverts, and other structures. This form shall be submitted to the appropriate personnel within the DOT and USFWS for recordkeeping (or uploaded into the Information, Planning, and Consultation (IPaC) Determination Key for use of the Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat) prior to conducting: any activities below the deck surface either from the underside or from above the deck surface that bore down to the underside; any activities that could impact expansion joints; any activities involving deck removal on bridges; or any activities involving structure demolition for bridges, culverts, and/or other structures.
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- If bat use of a bridge, culvert, and/or other structure is noted, additional studies may be undertaken during bat active season to identify the specific bat species utilizing the structure, or protected bat species presence can be assumed, in order to comply with threatened and endangered species regulations. Bat active season dates, typically between April and November, vary regionally and by species, so assessors should consult with their local USFWS Field Office for more specific active season dates.
- For use of the Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat – If the bridge/structure is 1,000 feet or more from suitable bat habitat[1] (e.g., an urban or agricultural area without suitable foraging habitat or corridors linking the bridge to suitable foraging habitat), check the appropriate box and fill out the table below. **No further assessment is required.**

Date & Time of Assessment 2/15/2024 11:40 AM	**DOT Project #**	**Route/Facility Carried** Henslow Trail Bridge over Route 53 perpendicular to the UPRR (Springfield to Chicago) at Mile Post 48	**County** Will
Federal Structure ID	**Structure Coordinates** (latitude and longitude) 41.376456, -88.129854	☐ This bridge/structure is 1,000 feet or more from suitable bat habitat[2] Name: Michael Jochheim Signature:	

- Any questions pertaining to assessments or this form should be directed to the local USFWS Field Office.

[1] Refer to the USFWS's summer survey guidance for the definition of suitable habitat (http://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html).

[2] This condition is only for use of the Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat

Bridge/Structure Bat Assessment Form

Date & Time of Assessment	DOT Project Number	Route/Facility Carried	County
2/15/2024 11:40 AM		Henslow Trail Bridge over Route 53 perpendicular to the UPRR (Springfield to Chicago) at Mile Post 48	Will
Federal Structure ID	**Structure Coordinates (latitude and longitude)** 41.376456, -88.129854	**Structure Height (approximate)** 30 ft	**Structure Length** 250 ft

Structure Type (check one)

Bridge Construction Style

- (•) Cast-in-place
- ( ) Flat Slab/Box
- ( ) Truss (Side View)
- ( ) Parallel Box Beam
- ( ) Pre-stressed Girder
- ( ) Steel I-beam
- ( ) Covered
- ( ) Other:

Culvert Type

- ( ) Box
- ( ) Pipe/Round
- ( ) Other:

Other Structure

- ( )

Structure Material (check all that apply)

Deck Material	*Beam Material*	*End/Back Wall Material*
[X] Metal	[ ] None	[X] Concrete
[ ] Concrete	[X] Concrete	[ ] Timber
[ ] Timber	[ ] Steel	[ ] Stone/Masonry
[ ] Open grid	[ ] Timber	[ ] Other:
[ ] Other:	[ ] Other:	

Creosote Evidence

- ( ) Yes (•) No
- ( ) Unknown

Culvert Material

- [ ] Metal
- [ ] Concrete
- [ ] Plastic
- [ ] Stone/Masonry
- [ ] Other:

Notes:

Crossings Traversed (check all that apply)

[ ] Bare ground	[ ] Open vegetation
[ ] Rip-rap	[ ] Closed vegetation
[ ] Flowing water	[X] Railroad
[ ] Standing water	[X] Road/trail - Type: Highway
[ ] Seasonal water	[ ] Other:

Surrounding Habitat (check all that apply)

[X] Agricultural	[X] Grassland
[X] Commercial	[ ] Ranching
[ ] Residential-urban	[ ] Riparian/wetland
[ ] Residential-rural	[ ] Mixed use
[ ] Woodland/forested	[ ] Other:

Areas Assessed (check all that apply)

Check all areas that apply. If an area is not present in the structure, check the "not present" box.
Document all bat indicators observed during the assessment. Include the species present, if known, and provide photo documentation as indicated.

Area (check if assessed)	Assessment Notes	Evidence of Bats (include photos if present)
[X] All crevices and cracks: **Bridges/culverts:** rough surfaces or imperfections in concrete **Other structures:** soffits, rafters, attic areas	[ ] Not present	[ ] Visual - live # dead # [ ] Guano [ ] Staining [ ] Audible [ ] Odor [ ] Photos [ ] Species
[X] Concrete surfaces (open roosting on concrete)	[ ] Not present	[ ] Visual - live # dead # [ ] Guano [ ] Staining [ ] Audible [ ] Odor [ ] Photos [ ] Species
[X] Spaces between concrete end walls and the bridge deck	[ ] Not present	[ ] Visual - live # dead # [ ] Guano [ ] Staining [ ] Audible [ ] Odor [ ] Photos [ ] Species
[ ] Crack between concrete railings on top of the bridge deck (Gap, Railing)	[X] Not present	[ ] Visual - live # dead # [ ] Guano [ ] Staining [ ] Audible [ ] Odor [ ] Photos [ ] Species
[X] Vertical surfaces on concrete I-beams	[ ] Not present	[ ] Visual - live # dead # [ ] Guano [ ] Staining [ ] Audible [ ] Odor [ ] Photos [ ] Species
[X] Spaces between walls, ceiling joists	[ ] Not present	[ ] Visual - live # dead # [ ] Guano [ ] Staining [ ] Audible [ ] Odor [ ] Photos [ ] Species
[X] Weep holes, scupper drains, and inlets/pipes	[ ] Not present	[ ] Visual - live # dead # [ ] Guano [ ] Staining [ ] Audible [ ] Odor [ ] Photos [ ] Species
[ ] All guiderails	[X] Not present	[ ] Visual - live # dead # [ ] Guano [ ] Staining [ ] Audible [ ] Odor [ ] Photos [ ] Species
[ ] All expansion joints	[X] Not present	[ ] Visual - live # dead # [ ] Guano [ ] Staining [ ] Audible [ ] Odor [ ] Photos [ ] Species

Name: Michael Jochheim

Signature:

APPENDIX D: Bridge/Structure Bat Assessment Form

Bridge/Structure Bat Assessment Form Instructions

- This form will be completed to document bat occupancy or bat use of bridges, culverts, and other structures. This form shall be submitted to the appropriate personnel within the DOT and USFWS for recordkeeping (or uploaded into the Information, Planning, and Consultation (IPaC) Determination Key for use of the Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat) prior to conducting: any activities below the deck surface either from the underside or from above the deck surface that bore down to the underside; any activities that could impact expansion joints; any activities involving deck removal on bridges; or any activities involving structure demolition for bridges, culverts, and/or other structures.
- Assessments must be completed within two (2) years of conducting any work (see the above bullet), regardless of whether assessments have been conducted in the past. Assessments must be completed in appropriate weather conditions, suitable for the assessor to observe common signs of bat use.
- Evidence of bat use may include visual observation (live and/or dead), presence of guano, presence of staining, audible observation, and/or odor observation. Presence of one or more indicators is sufficient evidence that bats may be using the bridge, culvert, and/or other structure.
- If bat use of a bridge, culvert, and/or other structure is noted, additional studies may be undertaken during bat active season to identify the specific bat species utilizing the structure, or protected bat species presence can be assumed, in order to comply with threatened and endangered species regulations. Bat active season dates, typically between April and November, vary regionally and by species, so assessors should consult with their local USFWS Field Office for more specific active season dates.
- For use of the Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat – If the bridge/structure is 1,000 feet or more from suitable bat habitat[1] (e.g., an urban or agricultural area without suitable foraging habitat or corridors linking the bridge to suitable foraging habitat), check the appropriate box and fill out the table below. **No further assessment is required.**

Date & Time of Assessment 02/15/2024 12:20 PM	**DOT Project #**	**Route/Facility Carried** UPRR (Springfield to Chicago) Bridge perpendicular to Prairie Creek west of Mile Post (MP) 49.5	**County** Will
Federal Structure ID	**Structure Coordinates** (latitude and longitude) 41.354523, -88.136172	☐ This bridge/structure is 1,000 feet or more from suitable bat habitat[2] Name: Michael Jochheim Signature:	

- Any questions pertaining to assessments or this form should be directed to the local USFWS Field Office.

[1] Refer to the USFWS's summer survey guidance for the definition of suitable habitat (http://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html).

[2] This condition is only for use of the Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat

Bridge/Structure Bat Assessment Form

Date & Time of Assessment 2/15/2024 12:20 PM	DOT Project Number	Route/Facility Carried UPRR (Springfield to Chicago) Bridge perpendicular to Prairie Creek west of Mile Post (MP) 49	County Will
Federal Structure ID	Structure Coordinates (latitude and longitude) 41.354523, -88.136172	Structure Height (approximate) 25 ft	Structure Length 104 ft

Structure Type (check one)

Bridge Construction Style

(•) Cast-in-place	( ) Pre-stressed Girder
( ) Flat Slab/Box	( ) Steel I-beam
( ) Truss (Side View)	( ) Covered
( ) Parallel Box Beam	( ) Other:

Culvert Type

( ) Box
( ) Pipe/Round
( ) Other:

Other Structure

( )

Structure Material (check all that apply)

Deck Material	*Beam Material*	*End/Back Wall Material*
[X] Metal	[ ] None	[X] Concrete
[ ] Concrete	[ ] Concrete	[ ] Timber
[ ] Timber	[ ] Steel	[ ] Stone/Masonry
[ ] Open grid	[ ] Timber	[ ] Other:
[ ] Other:	[X] Other: Concrete and stone	

Creosote Evidence

( ) Yes (•) No
( ) Unknown

Culvert Material

[ ] Metal
[ ] Concrete
[ ] Plastic
[ ] Stone/Masonry
[ ] Other:

Notes:

Crossings Traversed (check all that apply)

[ ] Bare ground	[ ] Open vegetation
[ ] Rip-rap	[ ] Closed vegetation
[X] Flowing water	[X] Railroad
[ ] Standing water	[ ] Road/trail - Type:
[ ] Seasonal water	[ ] Other:

Surrounding Habitat (check all that apply)

[X] Agricultural	[ ] Grassland
[ ] Commercial	[ ] Ranching
[ ] Residential-urban	[X] Riparian/wetland
[X] Residential-rural	[ ] Mixed use
[ ] Woodland/forested	[ ] Other:

Areas Assessed (check all that apply)

Check all areas that apply. If an area is not present in the structure, check the "not present" box.
Document all bat indicators observed during the assessment. Include the species present, if known, and provide photo documentation as indicated.

Area (check if assessed)	Assessment Notes	Evidence of Bats (include photos if present)
[ ] All crevices and cracks: **Bridges/culverts:** rough surfaces or [X] imperfections in concrete **Other structures:** soffits, rafters, attic areas	[ ] Not present	[ ] Visual - live # dead # [ ] Guano [ ] Staining; [ ] Audible [ ] Odor [ ] Photos; [ ] Species
[X] Concrete surfaces (open roosting on concrete)	[ ] Not present	[ ] Visual - live # dead # [ ] Guano [ ] Staining; [ ] Audible [ ] Odor [ ] Photos; [ ] Species
[ ] Spaces between concrete end walls and the bridge deck	[ ] Not present	[ ] Visual - live # dead # [ ] Guano [ ] Staining; [ ] Audible [ ] Odor [ ] Photos; [ ] Species
[X] Crack between concrete railings on top of the bridge deck (Gap, Railing)	[ ] Not present	[ ] Visual - live # dead # [ ] Guano [ ] Staining; [ ] Audible [ ] Odor [ ] Photos; [ ] Species
[X] Vertical surfaces on concrete I-beams	[ ] Not present	[ ] Visual - live # dead # [ ] Guano [ ] Staining; [ ] Audible [ ] Odor [ ] Photos; [ ] Species
[X] Spaces between walls, ceiling joists	[ ] Not present	[ ] Visual - live # dead # [ ] Guano [ ] Staining; [ ] Audible [ ] Odor [ ] Photos; [ ] Species
[X] Weep holes, scupper drains, and inlets/pipes	[ ] Not present	[ ] Visual - live # dead # [ ] Guano [ ] Staining; [ ] Audible [ ] Odor [ ] Photos; [ ] Species
[ ] All guiderails	[X] Not present	[ ] Visual - live # dead # [ ] Guano [ ] Staining; [ ] Audible [ ] Odor [ ] Photos; [ ] Species
[ ] All expansion joints	[X] Not present	[ ] Visual - live # dead # [ ] Guano [ ] Staining; [ ] Audible [ ] Odor [ ] Photos; [ ] Species

Name: Michael Jochheim

Signature:

APPENDIX D: Bridge/Structure Bat Assessment Form

Bridge/Structure Bat Assessment Form Instructions

- This form will be completed to document bat occupancy or bat use of bridges, culverts, and other structures. This form shall be submitted to the appropriate personnel within the DOT and USFWS for recordkeeping (or uploaded into the Information, Planning, and Consultation (IPaC) Determination Key for use of the Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat) prior to conducting: any activities below the deck surface either from the underside or from above the deck surface that bore down to the underside; any activities that could impact expansion joints; any activities involving deck removal on bridges; or any activities involving structure demolition for bridges, culverts, and/or other structures.
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Date & Time of Assessment 2/15/2023 10:30 AM	**DOT Project #**	**Route/Facility Carried** Perpendicular to UPRR (Springfield to Chicago) at Mile Post (MP) 51.5	**County** Will
Federal Structure ID	**Structure Coordinates** (latitude and longitude) 41.325828, -88.140890	☐ This bridge/structure is 1,000 feet or more from suitable bat habitat[2] Name: Michael Jochheim Signature:	

- Any questions pertaining to assessments or this form should be directed to the local USFWS Field Office.

[1] Refer to the USFWS's summer survey guidance for the definition of suitable habitat (http://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html).

[2] This condition is only for use of the Programmatic Biological Opinion for Transportation Projects in the Range of the Indiana Bat and Northern Long-Eared Bat

Bridge/Structure Bat Assessment Form

Date & Time of Assessment	DOT Project Number	Route/Facility Carried	County
2/15/2023 10:30 AM		Perpendicular to UPRR (Springfield to Chicago) at Mile Post (MP) 51 5	Will
Federal Structure ID	**Structure Coordinates** (latitude and longitude)	**Structure Height** (approximate)	**Structure Length**
	41 325828, -88 140890	4	68

Structure Type (check one)

Bridge Construction Style

○ Cast-in-place		○ Pre-stressed Girder	
○ Flat Slab/Box		○ Steel I-beam	
○ Truss	Side View	○ Covered	
○ Parallel Box Beam		○ Other:	

Culvert Type

- ○ Box
- ⊙ Pipe/Round
- ○ Other:

Other Structure

- ○

Structure Material (check all that apply)

Deck Material	*Beam Material*	*End/Back Wall Material*
☐ Metal	☐ None	☐ Concrete
☐ Concrete	☐ Concrete	☐ Timber
☐ Timber	☐ Steel	☐ Stone/Masonry
☐ Open grid	☐ Timber	☐ Other:
☐ Other:	☐ Other:	

Creosote Evidence

- ○ Yes ⊙ No
- ○ Unknown

Culvert Material

- ☒ Metal
- ☐ Concrete
- ☐ Plastic
- ☐ Stone/Masonry
- ☐ Other:

Notes:

Crossings Traversed (check all that apply)

☐ Bare ground	☐ Open vegetation
☐ Rip-rap	☐ Closed vegetation
☒ Flowing water	☒ Railroad
☐ Standing water	☐ Road/trail - Type:
☐ Seasonal water	☐ Other:

Surrounding Habitat (check all that apply)

☒ Agricultural	☐ Grassland
☐ Commercial	☐ Ranching
☐ Residential-urban	☐ Riparian/wetland
☒ Residential-rural	☐ Mixed use
☐ Woodland/forested	☐ Other:

Areas Assessed (check all that apply)

Check all areas that apply. If an area is not present in the structure, check the "not present" box.
Document all bat indicators observed during the assessment. Include the species present, if known, and provide photo documentation as indicated.

Area (check if assessed)	Assessment Notes	Evidence of Bats (include photos if present)
☐ All crevices and cracks: **Bridges/culverts:** rough surfaces or ☒ imperfections in concrete **Other structures:** soffits, rafters, attic areas	☐ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Concrete surfaces (open roosting on concrete)	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Spaces between concrete end walls and the bridge deck	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Crack between concrete railings on top of the bridge deck (Gap, Railing)	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Vertical surfaces on concrete I-beams	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Spaces between walls, ceiling joists	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Weep holes, scupper drains, and inlets/pipes	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ All guiderails	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ All expansion joints	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species

Name: Michael Jochheim

Signature:

APPENDIX D: Bridge/Structure Bat Assessment Form

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Bridge/Structure Bat Assessment Form

Date & Time of Assessment: 2/15/2023 10:30 AM	DOT Project Number:	Route/Facility Carried: Perpendicular to UPRR (Springfield to Chicago) at Mile Post (MP) 51.5	County: Will
Federal Structure ID:	Structure Coordinates (latitude and longitude): 41.325828, -88.140890	Structure Height (approximate): 4	Structure Length: 68

Structure Type (check one)

Bridge Construction Style

- ○ Cast-in-place
- ○ Flat Slab/Box
- ○ Truss (Side View)
- ○ Parallel Box Beam
- ○ Pre-stressed Girder
- ○ Steel I-beam
- ○ Covered
- ○ Other:

Culvert Type

- ○ Box
- ⊙ Pipe/Round
- ○ Other:

Other Structure

- ○

Structure Material (check all that apply)

Deck Material	*Beam Material*	*End/Back Wall Material*
☐ Metal	☐ None	☐ Concrete
☐ Concrete	☐ Concrete	☐ Timber
☐ Timber	☐ Steel	☐ Stone/Masonry
☐ Open grid	☐ Timber	☐ Other:
☐ Other:	☐ Other:	

Creosote Evidence

- ○ Yes ⊙ No
- ○ Unknown

Culvert Material

- ☒ Metal
- ☐ Concrete
- ☐ Plastic
- ☐ Stone/Masonry
- ☐ Other:

Notes:

Corrugated metal

Crossings Traversed (check all that apply)

☐ Bare ground	☐ Open vegetation
☐ Rip-rap	☐ Closed vegetation
☒ Flowing water	☒ Railroad
☐ Standing water	☐ Road/trail - Type:
☐ Seasonal water	☐ Other:

Surrounding Habitat (check all that apply)

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☐ Spaces between concrete end walls and the bridge deck	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Crack between concrete railings on top of the bridge deck (Gap, Railing)	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
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☐ Spaces between walls, ceiling joists	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ Weep holes, scupper drains, and inlets/pipes	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ All guiderails	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species
☐ All expansion joints	☒ Not present	☐ Visual - live # dead # ☐ Guano ☐ Staining ☐ Audible ☐ Odor ☐ Photos ☐ Species

Name: Michael Jochheim

Signature:

High Speed Rail Tier 8 – Elwood to Braidwood
Mile Posts 52.4 to 45.7
Will County, Illinois
Bat Assessment Photographic Log
February 15, 2024

Client Name: WSP	**Site Location:** Union Pacific Railroad (Springfield to Chicago) from Mile Posts 52.4 to 45.7	**Project No.** 81.0220288.16

Photo 1 Facing north toward the opening of one of two culverts located beneath the Union Pacific Railroad (Springfield to Chicago line [UPRR]) at Mile Post (MP) 51.5.

Photo 2 Facing east toward northern most culvert at MP 51.5, representative of conditions throughout the pipe culvert.

Photo 3 Facing the southwest toward the opening of the second of two culverts located beneath the UPRR at MP 51.5.

Photo 4 Facing east toward southern most culvert at MP 51.5, representative of conditions throughout the pipe culvert.

Client Name: WSP	**Site Location:** Union Pacific Railroad (Springfield to Chicago) from Mile Posts 52.4 to 45.7	**Project No.** 81.0220288.16

Photo 5 Facing northwest toward the UPRR bridge over Pebble Creek, located at MP 49.5 and west of Illinois Highway 53.

Photo 6 Facing south toward the southern end wall of the bridge structure located at MP 49.5.

Photo 7 Facing north toward the northern end wall of the bridge structure located at MP 49.5.

Photo 8 Facing northeast toward concrete vertical surfaces on the bridge structure's I-beams located at MP 49.5.

Client Name: WSP	**Site Location:** Union Pacific Railroad (Springfield to Chicago) from Mile Posts 52.4 to 45.7	**Project No.** 81.0220288.16

Photo 9 Facing south toward the southern half of the bridge structure located at MP 49.5.

Photo 10 Facing southwest toward the opening of a pipe culvert located beneath the UPRR at MP 48.9.

Photo 11 Facing east toward the culvert located at MP 48.9, representative of conditions throughout the pipe culvert.

Photo 12 Facing north from the opening of the culvert located at MP 48.8 toward Illinois Highway 53.

Client Name: WSP	**Site Location:** Union Pacific Railroad (Springfield to Chicago) from Mile Posts 52.4 to 45.7	**Project No.** 81.0220288.16

Photo 13 Facing east from the west end of the culvert located at UPRR MP 48.9.

Photo 14 Facing northeast toward a box culvert beneath Illinois Highway 53 and east of the UPRR MP 48.9.

Photo 15 Facing east toward the culvert located east of the UPRR MP 48.9, representative of conditions throughout the pipe culvert.

Photo 16 Facing north toward the upper deck and guardrails at the culvert located east of UPRR MP 48.9.

Client Name: WSP	**Site Location:** Union Pacific Railroad (Springfield to Chicago) from Mile Posts 52.4 to 45.7	**Project No.** 81.0220288.16

Photo 17 Facing southwest toward the UPRR from the opening of the culvert located at MP 48.9.

Photo 18 Facing west toward the Henslow Trail Bridge located over Illinois Highway 53 and the UPRR at MP 48.

Photo 19 Facing northeast toward the Henslow Trail Bridge's ceiling joists and upper deck.

Photo 20 Facing west toward the Henslow Trail Bride concrete I-beams with staining that appears to water draining off the upper bridge deck.

Client Name: WSP	**Site Location:** Union Pacific Railroad (Springfield to Chicago) from Mile Posts 52.4 to 45.7	**Project No.** 81.0220288.16

Photo 21 Facing west toward a pipe culvert located beneath the UPRR at MP 47.3.

Photo 22 Facing west toward the culvert located at UPRR MP 47.3, representative of conditions throughout the pipe culvert.

Photo 23 Facing northwst toward cracks within the western half of the culvert located at UPRR MP 47.3 with what appears to be staining due to water draining from the railroad tracks.

Photo 24 Facing southwest toward the western half of the culvert located at UPRR MP 47.3, with what apppears to be staining due to water draining from the railroas tracks.

Client Name: WSP	**Site Location:** Union Pacific Railroad (Springfield to Chicago) from Mile Posts 52.4 to 45.7	**Project No.** 81.0220288.16

Photo 25 Facing south toward the eastern opening of the culvert located at UPRR MP 47.3 with cracks, crevices, and holes evident in the side walls.

Photo 26 Facing west toward a pipe culvert located beneath the UPRR at MP 46.7.

Photo 27 Facing east toward the culvert located at MP 46.7, representative of conditions throughout the pipe culvert.

Photo 28 Facing south toward large cracks within the eastern portion of the culvert located at UPRR MP 46.7

Huff & Huff, a Subsidiary of GZA