



October 11, 2021

Mr. James Durian, Chief Executive Officer
Marshall Area Economic Development Alliance
323 West Michigan Avenue
Marshall, MI 49068

Re: CONFIDENTIAL - Protected Species Habitat Assessment
Marshall Mega Site Project
Burns & McDonnell Project No: 134707

Dear Mr. Durien:

Burns & McDonnell Michigan, Inc. (Burns & McDonnell) was retained by the Marshall Area Economic Development Alliance to provide protected habitat assessment services for the Marshall Mega Site Project (Project). The Project site consists predominantly of agricultural land and undeveloped, forested habitat located between the City of Marshall, which lies to the east, and the unincorporated community of Ceresco, which lies to the west, within Calhoun County, Michigan (Figures 1 and 2, Appendix A). The following sections provide information on the proposed Project and summarize the completed protected species habitat assessment.

INTRODUCTION

The Marshall Area Economic Development Alliance is currently evaluating the potential for developing the Project, a commercial or industrial facility and associated infrastructure. The Project site is generally bounded by Michigan Avenue (Michigan Highway 96 [M-96]) on the north, the North Branch Kalamazoo River on the south, Bear Creek on the east, and 12 Mile Road on the west, in Calhoun County, Michigan (Figures 1 and 2, Appendix A). Burns & McDonnell understands that areas identified as potential options for the proposed Project would consist of approximately 1,770 acres (Survey Area), which is the area included in the habitat assessment.

Burns & McDonnell conducted a habitat assessment of the Project on September 15 and 16, 2021. The habitat assessment consisted of a desktop analysis and field reconnaissance. The desktop analysis included an evaluation of protected species data available at the state and federal level. Results of the desktop analysis provided the focus for the field assessment to identify suitable protected species habitat within the Survey Area.

This habitat assessment report describes the methods and results of the review of the desktop analysis and field habitat assessment for the Project to remain in compliance with the following regulations:

- Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.) as implemented by the U.S. Fish and Wildlife Service (USFWS)



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- Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668) as implemented by the USFWS
- Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703) as implemented by the USFWS
- Endangered Species Act of the State of Michigan (Part 365 of PA 451, 1994 Michigan Natural Resources and Environmental Protection Act) as implemented by the Department of Natural Resources (DNR). The Michigan Natural Features Inventory (MNFI) maintains a database on the locations of rare species and natural communities in Michigan.

DESKTOP ANALYSIS

Burns & McDonnell conducted a desktop analysis of the Survey Area, which included a review of Federal (USFWS) and State (MNFI) databases to identify potential habitat for protected species in the vicinity of the Project and to help focus the field assessment effort. The results of the database review are summarized below.

Federally Protected Species

The USFWS Information for Planning and Consultation System (IPaC) was used to identify federally protected species within the Survey Area. Additionally, the MNFI database review results in Section 7 compliance comments to assist with Project planning. IPaC identified four species protected by the ESA; one is listed as federally endangered, two are listed as federally threatened, and one is a candidate for listing (Table 1 and Appendix B). The MNFI results did not have the monarch butterfly (*Danaus plexippus*) listed as potentially present within the 1.5 mile search buffer (Appendix B). There are no designated critical habitats present within the Survey Area.

Table 1: Federally Protected Species Potentially Occurring within the Survey Area

Species	Federal Status ^a	Habitat Type Summary
Mammals		
Indiana bat (<i>Myotis sodalis</i>)	E	Winter hibernacula includes caves or abandoned mines. Summer roosting habitat includes wooded areas containing dead or dying trees or living trees that have cracks, crevices, and/or exfoliating bark and a diameter-at-breast-height of 5 inches or greater. Tend to forage within forests or along forest edges.



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Table 1: Federally Protected Species Potentially Occurring within the Survey Area

Species	Federal Status ^a	Habitat Type Summary
Northern long-eared bat (<i>Myotis septentrionalis</i>)	T with 4(d) ^b	Winter hibernacula includes caves or abandoned mines. Summer roosting habitat includes wooded areas containing dead or dying trees or living trees that have cracks, crevices, and/or exfoliating bark and a diameter-at-breast-height of 3 inches or greater. Tend to forage in forests or along forest edges.
Reptiles		
Eastern massasauga (rattlesnake) (<i>Sistrurus catenatus</i>)	T	Generally live in wet areas including wet prairies, marshes, fens, sedge meadows, peatlands, and low areas along rivers and lakes. Use adjacent uplands (shrubland, open woodlands, prairie) during part of the year. Often hibernate alone in crayfish burrows but may also be found under logs and tree roots or in small mammal burrows.
Insects		
Monarch butterfly (<i>Danaus plexippus</i>)	C ^c	In many regions where monarchs are present, monarchs breed year-round. Individual monarchs in temperate climates, such as eastern and western North America, undergo long-distance migration, and live for an extended period of time. In the fall, in both eastern and western North America, monarchs begin migrating to their respective overwintering sites. This migration can take monarchs distances of over 3,000 km and last for over two months. In early spring (February-March), surviving monarchs break diapause and mate at the overwintering sites before dispersing. The same individuals that undertook the initial southward migration begin flying back through the breeding grounds and their offspring start the cycle of generational migration over again.

Source: USFWS Midwest Region Endangered Species (<https://www.fws.gov/midwest/endangered/lists/michigan-cty.html>); USFWS Information, Planning and Conservation System (IPaC) Resource List, Calhoun County, MI, accessed September 24, 2021 (<https://ecos.fws.gov/ipac/location/B3EWBLMDBRA3TCKVPPINTKJLA/resources>).

- (a) E = Listed as Federally Endangered; T = Listed as Federally Threatened
- (b) 4(d) = Federally listed with 4(d) rule exemptions on specific activities traditionally identified as take activities under the Endangered Species Act.
- (c) The monarch butterfly is a candidate species and not yet listed or proposed for listing. There are generally no ESA Section 7 requirements for candidate species (see Section 7 Q&A at <https://www.fws.gov/savethemonarch/FAQ-Section7.html>).



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The IPaC database also identified six migratory bird species protected by the BGEPA and MBTA that may potentially occur within the Survey Area (Table 2 and Appendix B). **Table 2: Federally Protected Migratory Bird Species Potentially Occurring within the Survey Area**

Species	Federal Status ^a	Habitat Type Summary
Bald eagle (<i>Haliaeetus leucocephalus</i>)	BGEPA	Habitat close to bodies of water such as wetlands, on the coasts, near lakes or rivers, and marshes. Prefer hardwoods for roosting, perching, and nesting.
Bobolink (<i>Dolichonyx oryzivorus</i>)	BCC	Large fields with a mixture of grasses and broad-leaved plants like legumes and dandelions.
Lesser yellowlegs (<i>Tringa flavipes</i>)	BCC	Breeds in the meadows and open woodlands of boreal Canada.
Red-headed woodpecker (<i>Melanerpes erythrocephalus</i>)	BCC	Deciduous woodlands with oak or beech, groves of dead or dying trees, river bottoms, burned areas, recent clearings, forest edges, or roadsides.
Rusty blackbird (<i>Euphagus carolinus</i>)	BCC	Breeds in wet forests and spends winters in swamps, wet woodlands, and pond edges.
Wood thrush (<i>Hylocichla mustelina</i>)	BCC	Mature deciduous and mixed forests.

Source: USFWS Midwest Region Endangered Species (<https://www.fws.gov/midwest/endangered/lists/michigan-cty.html>); USFWS Information, Planning and Conservation System (IPaC) Resource List, Calhoun County, MI, accessed September 24, 2021 (<https://ecos.fws.gov/ipac/location/B3EWBLMDBRA3TCKVPPINTKJKLA/resources>).

(a) BGEPA = Bald and Golden Eagle Protection Act; BCC = Bird of Conservation Concern

State Protected Species

Burns & McDonnell submitted a request to the MNFI on August 24, 2021. The MNFI data request identified 10 State threatened or endangered species that may be present within one and a half miles of the Project Area. According to the MNFI, the Project may have negative impacts and further coordination may be necessary for the species identified. The results from the MNFI rare species review are included in Appendix B and summarized below in Table 3.



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Table 3: State Threatened and Endangered Species Known or Likely to Occur in the Survey Area

Common Name	State Status ^a	Habitat Type
Animal		
Regal fritillary (<i>Speyeria idalia</i>)	E	Prairie or open environments frequently in sandy regions. Meadows, old fields, and floodplain forest openings and edges.
Least shrew (<i>Cryptotis parva</i>)	T	Dry upland meadows with dense coverage of grasses and forbs. Also, marshy areas, fencerows, and woodland edges.
Black sandshell (<i>Ligumia recta</i>)	E	Rivers with strong currents and lakes with a firm substrate of gravel or sand.
Plant		
Wild rice (<i>Zizania aquatica</i>)	T	Rivers, streams, lakes, ponds in waters less than 2 feet deep in areas with a slight current over a mucky or silty bottom.
Prairie birdfoot violet (<i>Viola pedatifida</i>)	T	Rich, mesic, blacksoil prairies.
Goldenseal (<i>Hydrastis canadensis</i>)	T	Southern hardwood forests, as well as moist ravines and portions of riparian forests.
Queen-of-the-prairie (<i>Filipendula rubra</i>)	T	Prairie fens, wet prairies, wet meadows, and low woods, most commonly in calcareous habitats.
Rattlesnake-master or button snakeroot (<i>Eryngium yuccifolium</i>)	T	Sedge and grass-dominated portions of prairie fen complexes, including thickets along stream drainages. Also found in sandy soils and wet prairies in former oak savannas and oak barrens, often occurring in small remnants along power lines and railroad rights-of-ways.
Rosinweed (<i>Silphium integrifolium</i>)	T	Prairie remnants along roads and railroad tracks or in cemeteries, in wet-mesic prairies and fens on peaty mucks and loams, and on dry-mesic to mesic loams and sandy loams.
Cup plant (<i>Silphium perfoliatum</i>)	T	River floodplains in forest openings and edges.

Source: MNFI 2021, Rare Species Review #2995

(a) E = Listed as State Endangered; T = Listed as State Threatened

The MNFI data request also identified 10 state special concern species that may be present within one and a half miles of the Survey Area. Special concern species and natural communities are not protected under endangered species legislation, but efforts should be taken to minimize any or all impacts.



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FIELD ANALYSIS

Based on the results of the initial desktop evaluation, Burns & McDonnell biologists conducted an onsite, field habitat assessment within the Survey Area on September 15 and 16, 2021. All habitat types within the Survey Area were categorized based on vegetation communities, position in the landscape, and other relevant characteristics. Potential occurrence of federally and state-protected species and/or their habitat within the Survey Area was evaluated based on the known characteristics of species life histories.

Habitat Types

Habitat types identified during the desktop analysis included all the land use categories from the National Land Cover Database (U.S. Geological Survey [USGS], 2016; Figure 3, Appendix A). For categorization purposes during the field assessment, similar land use types were combined and include cultivated crops and developed areas. A photographic log containing images representative of the habitat types within the Survey Area is included in Appendix C.

Cultivated crops within the Survey Area consist of row crops including corn (*Zea mays*) and soybeans (*Glycine max*) on active farms. Cultivated crops and pastureland comprises approximately 89 percent of the habitat within the Survey Area. Because of their intensive, continuous use and monoculture farming practices, the agricultural fields within the Survey Area do not provide suitable habitat or foraging habitat for any federal or state protected species. However, agricultural fields and pastureland may provide stopover locations for migratory birds.

Forested areas comprise approximately six percent of the habitat within the Survey Area. Forest habitats consist primarily of species such as oak sp. (*Quercus* sp.), hickory sp. (*Carya* sp.), European buckthorn (*Rhamnus cathartica*), Amur honeysuckle (*Lonicera maackii*), black cherry (*Prunus serotina*), spruce (*Picea* sp.), American basswood (*Tilia americana*), and black walnut (*Juglans nigra*). The forested habitat within the Survey Area contains suitable habitat for the federally protected bat species identified in this report.

Developed areas comprise approximately three percent of the Survey Area and consists of farmsteads. These areas are generally actively maintained and landscaped. Developed land in the Survey Area does not provide suitable habitat for any federal or state protected species

Wetland areas comprise approximately two percent of the Survey Area. The wetlands are primarily located between the railroad tracks and the Kalamazoo River and along Bear Creek (Figure 4, Appendix A). Dominant vegetation within the wetlands consisted of reed canary grass (*Phalaris arundinacea*), purple Joe-Pye weed (*Eutrochium purpureum*), American basswood, gray dogwood (*Cornus racemosa*), prairie cordgrass (*Spartina pectinata*), European buckthorn (*Rhamnus cathartica*), kudzu (*Pueraria montana*), riverbank grape (*Vitis riparia*),



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purple loosestrife (*Lythrum salicaria*), black elderberry (*Sambucus nigra*), panicled aster (*Symphotrichum lanceolatum*), common fox sedge (*Carex vulpinoidea*), sedge sp. (*Carex* sp.), and common spike rush (*Eleocharis palustris*).

Open water, barren land, and grassland comprise less than one percent of the habitat within the Survey Area. Open water areas consist of Bear Creek and the Kalamazoo River. Barren land and grassland consist primarily of grass species such as brome (*Bromus* sp.), fescue (*Festuca* sp.), and grass (*Poa* sp.). Open land can serve as movement corridors and flyways. Open grassland within the Survey Area ranged in species diversity. The open areas with higher species diversity north of the Kalamazoo River could provide suitable habitat for protected species.

Evaluation of the habitats identified within the Survey Area with regard to each federally and state protected species is described below.

Federally Protected Species

Indiana Bat

The Indiana bat is a federally endangered species. The closest designated critical habitat for the Indiana bat is located approximately 210 miles southwest of the Survey Area. However, forested habitat is present within the Survey Area, which could provide suitable roosting and foraging habitat for the Indiana bat. Trees present within the deciduous forest habitat and tree lines along agricultural fields and roadways within the Survey Area contain suitable roosting and/or foraging habitat for the Indiana Bat (Figure 5, Appendix A). Additional coordination with the USFWS may be required to determine the potential for the Project to affect the Indiana bat. Therefore, the Project **may affect but is not likely to adversely affect** the Indiana bat. Additional project review and/or coordination with the USFWS is recommended when Project plans have been developed and may change the effect determination. If tree removal can be conducted between October 1 and March 31, a no effect determination is likely.

Northern Long-eared Bat

The northern long-eared bat is a federally threatened species with a 4(d) rule (Final Rule; 50 CFR Part 17). Under the 4(d) rule, prohibitions for tree-removal activities include those activities that: (1) occur within 0.25 mile of a known hibernaculum; or (2) cuts or destroys known occupied maternity roost trees, or any other trees within a 150-foot radius from the maternity roost tree, during the pup season (June 1 through July 31). The exemption to the 4(d) rule allows for tree removal if the activity occurs more than 0.25 mile from a known and occupied bat hibernacula, avoid cutting or destroying known and occupied roost trees during the bat pup season, and avoid forest clear-cuts within 0.25 mile of known and occupied roost trees during the bat pup season. Critical habitat has not been designated for this species by the USFWS. Trees present within the deciduous forest habitat and tree lines along agricultural fields and roadways within the Survey Area contain suitable roosting and/or foraging habitat



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for the Indiana Bat (Figure 5, Appendix A). The IPaC did not identify a known northern long-eared bat hibernaculum within 0.25 mile or a known maternity roost tree within 150 feet of the Survey Area. Under the 4(d) rule, the Project is anticipated to have **no effect** on the northern long-eared bat.

Eastern Massasauga

The eastern massasauga rattlesnake is a federally threatened species. Critical habitat has not been designated for this species by the USFWS. Massasaugas depend on wetlands for food and shelter and often use nearby upland areas during part of the year. Suitable habitat which includes graminoid dominated plant communities (fens, sedge meadows, peatlands, wet prairies, open woodlands, and shrublands) is present within the Survey Area south of the railroad tracks and along Bear Creek, however the Survey Area falls outside of Tier 1 or Tier 2 eastern massasauga rattlesnake habitat as designated by the USFWS (Appendix B). It is anticipated the Project **may affect but is not likely to adversely affect** the eastern massasauga. Additional project review and/or coordination with the USFWS is recommended when Project plans have been developed and may change the effect determination.

Bald Eagle

Bald eagles are protected under the BGEPA, which was established in 1940 and amended in 1962 to include golden eagles (*Aquila chrysaetos*). The Act prohibits anyone without a permit from “taking” bald or golden eagles, which includes their feathers, nests, or eggs. No bald or golden eagles or their nests were observed within the Survey Area at the time of the site visit, however trees were surveyed during full leaf-out and therefore a detailed nest survey as not completed. Suitable trees for nesting and foraging habitat are present south of the railroad tracks adjacent to the Kalamazoo River within the Survey Area. It is anticipated the Project is **unlikely to impact** bald eagles. Should any bald eagles or nests be identified during the Project, further coordination with the USFWS is recommended.

State Protected Species

Animals

Suitable habitat for the regal fritillary is present within portions of the open grassland areas within the Survey Area, predominantly south of the railroad tracks adjacent to the Kalamazoo River. No regal fritillary was observed within the Survey Area at the time of the site visit; however, a formal presence/absence survey was not conducted. Due to the mobility of the species and abundance of similar habitat adjacent to the Project, the Project is **unlikely to impact** the regal fritillary. Additional project review and/or coordination with the DNR is recommended when Project plans have been developed and may change the effect determination.

Suitable habitat for the least shrew is present within portions of the open grassland areas within the Survey Area, predominantly south of the railroad tracks adjacent to the Kalamazoo River.



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No least shrews were observed within the Survey Area at the time of the site visit; however, a formal presence/absence survey was not conducted. Additional coordination with the DNR may be required to determine the potential for the Project to affect the least shrew if development is to occur within areas of suitable habitat. Therefore, the Project has a **potential to impact** the least shrew.

A total of three streams were identified within the Survey Area during the wetland delineation conducted for the Project (Figure 4, Appendix A). No black sandshell mussels, either live or relic shells, were identified during the site visit, however a formal presence/absence survey was not conducted. Suitable habitat for the black sandshell is likely present within the Kalamazoo River. In-stream activities have the potential to impact mussel species. A mussel survey and relocation as well as Best Management Practices (BMPs) during construction can avoid and/or minimize impacts to the black sandshell. If streams are avoided or the recommended BMPs followed, the Project is **unlikely to impact** black sandshell.

Vascular Plants

The MNFI database had provided listed vascular plants within 1.5 miles of the Survey Area including wild rice, prairie birdfoot violet, goldenseal, queen-of-the-prairie, rattlesnake-master, rosinweed, and cup plant. Suitable habitat is present within the upland and wetland areas along the railroad tracks and between the railroad tracks and the Kalamazoo River within the Survey Area. Of those seven species, queen-of-the-prairie, rattlesnake-master, rosinweed, and cup plant are documented within the Survey Area or within the immediate vicinity of the Survey Area; therefore, the Project has the **potential to impact** state protected vascular plant species. Management and conservation recommendations are included in the Rare Species Review (Appendix B). Additional coordination with the DNR is recommended to determine the potential for the Project to affect listed vascular plants and determine the need for surveys and/or permits.

State Species of Special Concern

A total of 10 species of state special concern are known to occur within 1.5 miles of the Survey Area, with two species last documented over 90 years ago. The remaining eight species were last documented this century. Suitable habitat for these species are present south of the railroad tracks. State special concern species and natural communities are not protected under endangered species legislation, but efforts should be taken to minimize impacts. Management and conservation recommendations are included in the Rare Species Review (Appendix B).

SUMMARY

Burns & McDonnell conducted a wildlife and habitat assessment of the Survey Area to identify potential habitat for federal and state listed species. The Survey Area was comprised primarily of agricultural row crops with natural areas limited to south of the railroad tracks and along



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Bear Creek. Active agricultural fields present throughout the majority of the Survey Area have a low likelihood of listed species habitat in these areas. Upland grassland, deciduous forest, wet prairie and scrub-shrub habitat between the railroad tracks and the Kalamazoo River provides suitable habitat for federal and state protected species.

No listed federal or state threatened or endangered species or state species of special concern were identified within the Survey Area during the site visit; however, no formal presence/absence surveys were completed. The Project **may affect, but is not likely to adversely affect** the Indiana bat and eastern massasauga rattlesnake and have **no effect** on the Northern long-eared bat. The Project has the **potential to impact** state listed species, some of which are known to occur within or in the immediate vicinity of the project. Additional coordination with the USFWS and DNR is recommended to determine the potential for the Project to affect listed species and determine the need for surveys and/or permits.

If you have any questions or require additional information, please feel free to contact Evan Markowitz at (331) 205-8911 or ejmarkowitz@burnsmcd.com.

Sincerely,

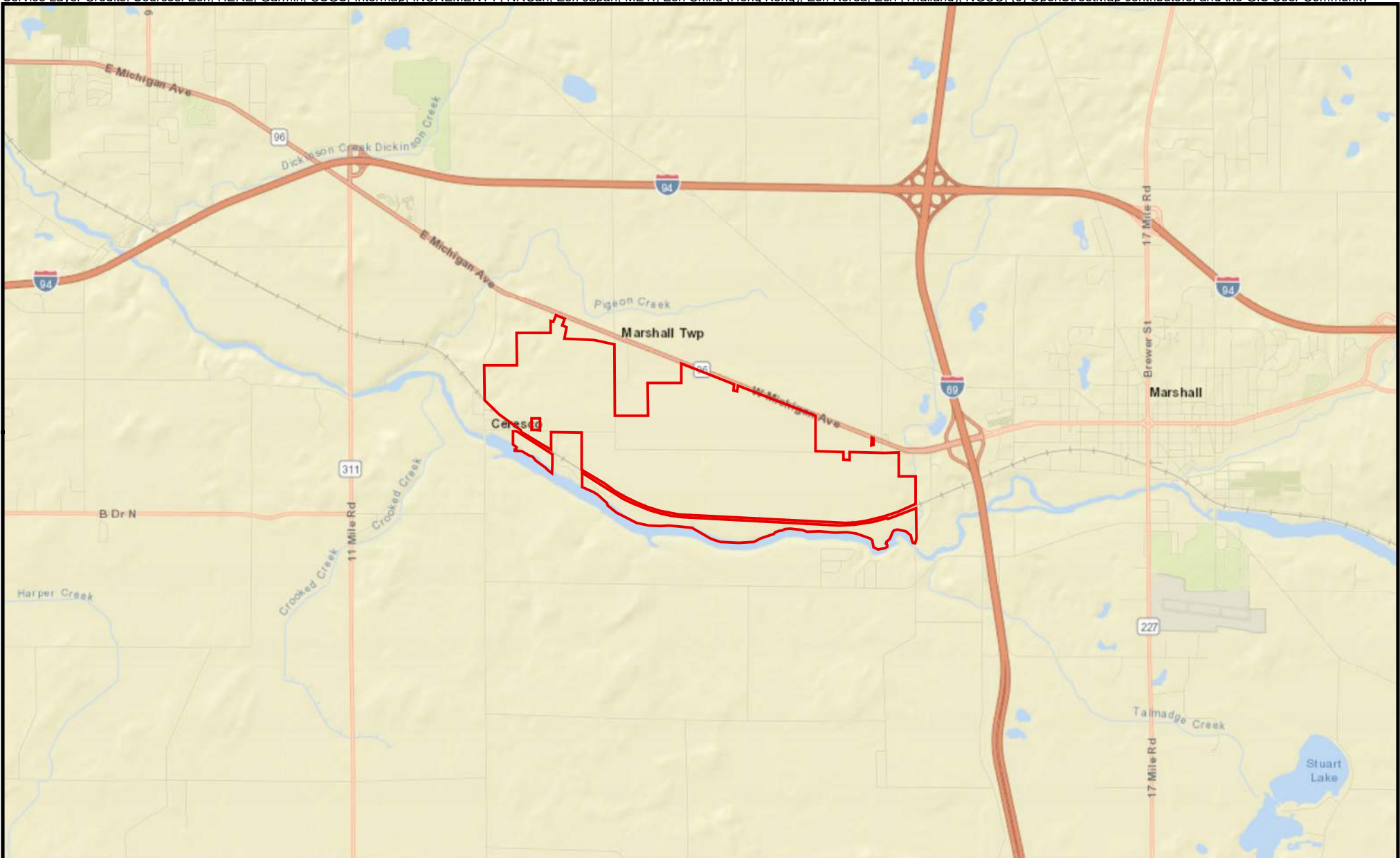
A handwritten signature in blue ink that reads "Evan Markowitz".


Evan Markowitz
Senior Environmental Scientist, PWS

Attachments:

- Appendix A - FIGURES
- Appendix B - AGENCY COORDINATION
- Appendix C - PHOTOGRAPH LOG

APPENDIX A -FIGURES



 Survey Area

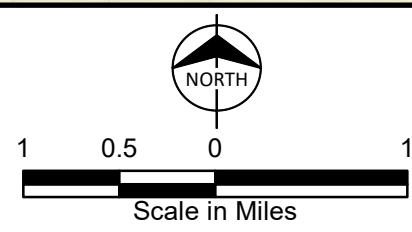
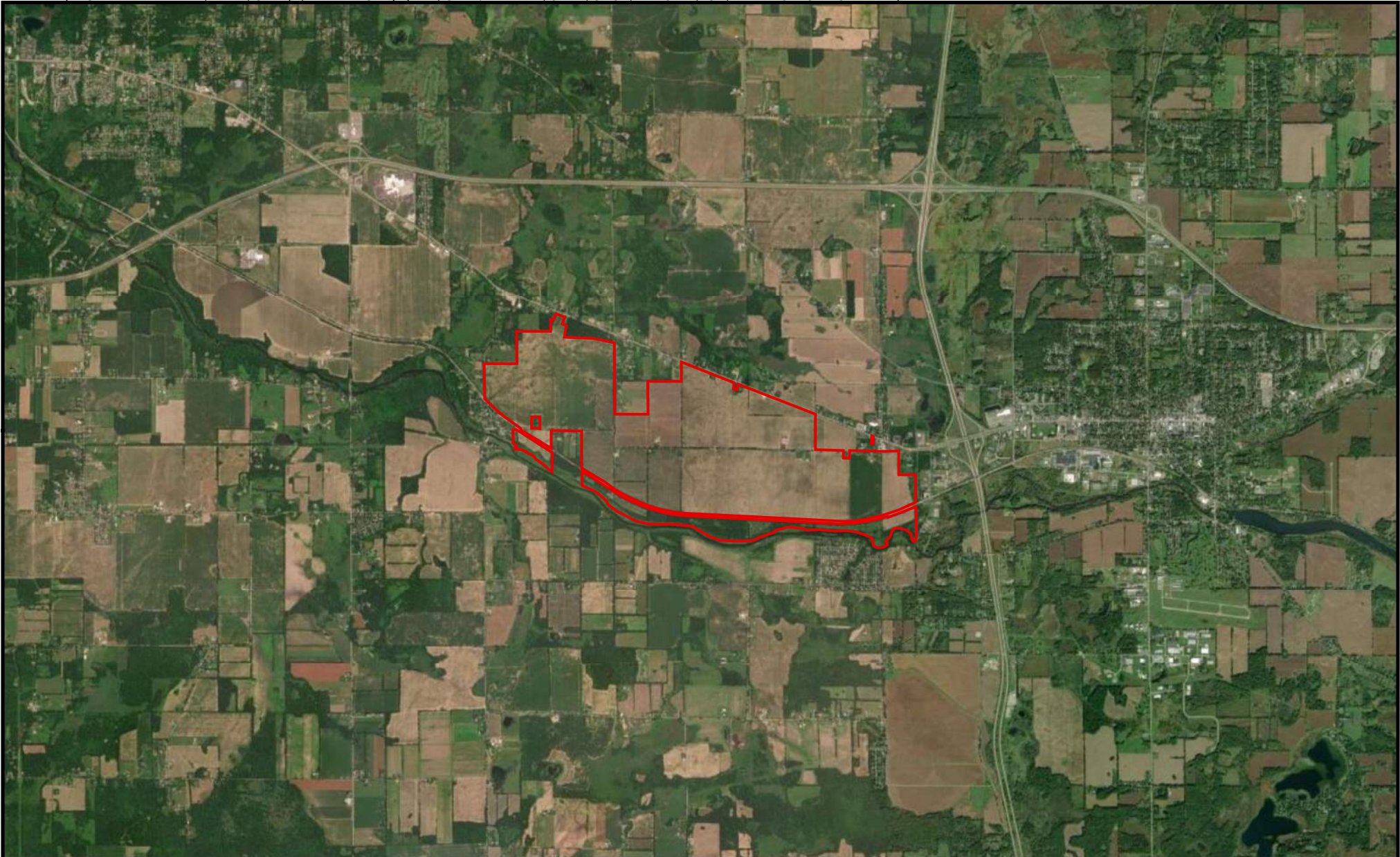


Figure 1
Overview Map
Marshall Mega Site
Calhoun County, MI



 Survey Area

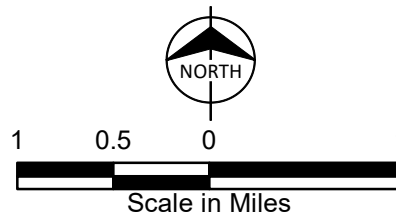
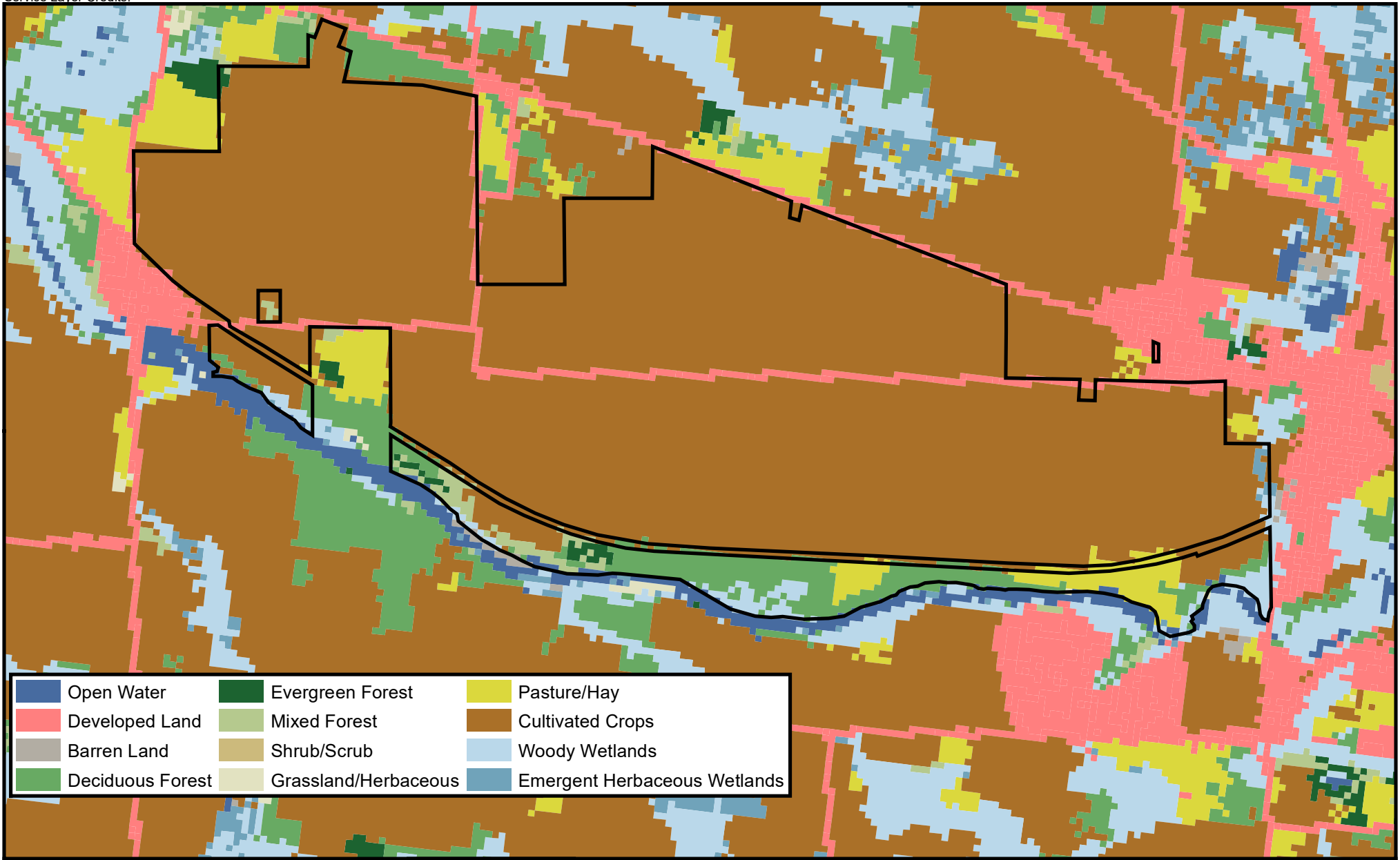


Figure 2
Overview Map
Marshall Mega Site
Calhoun County, MI



Survey Area

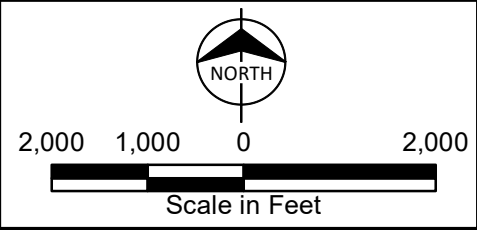
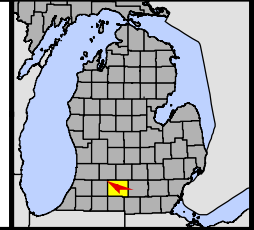
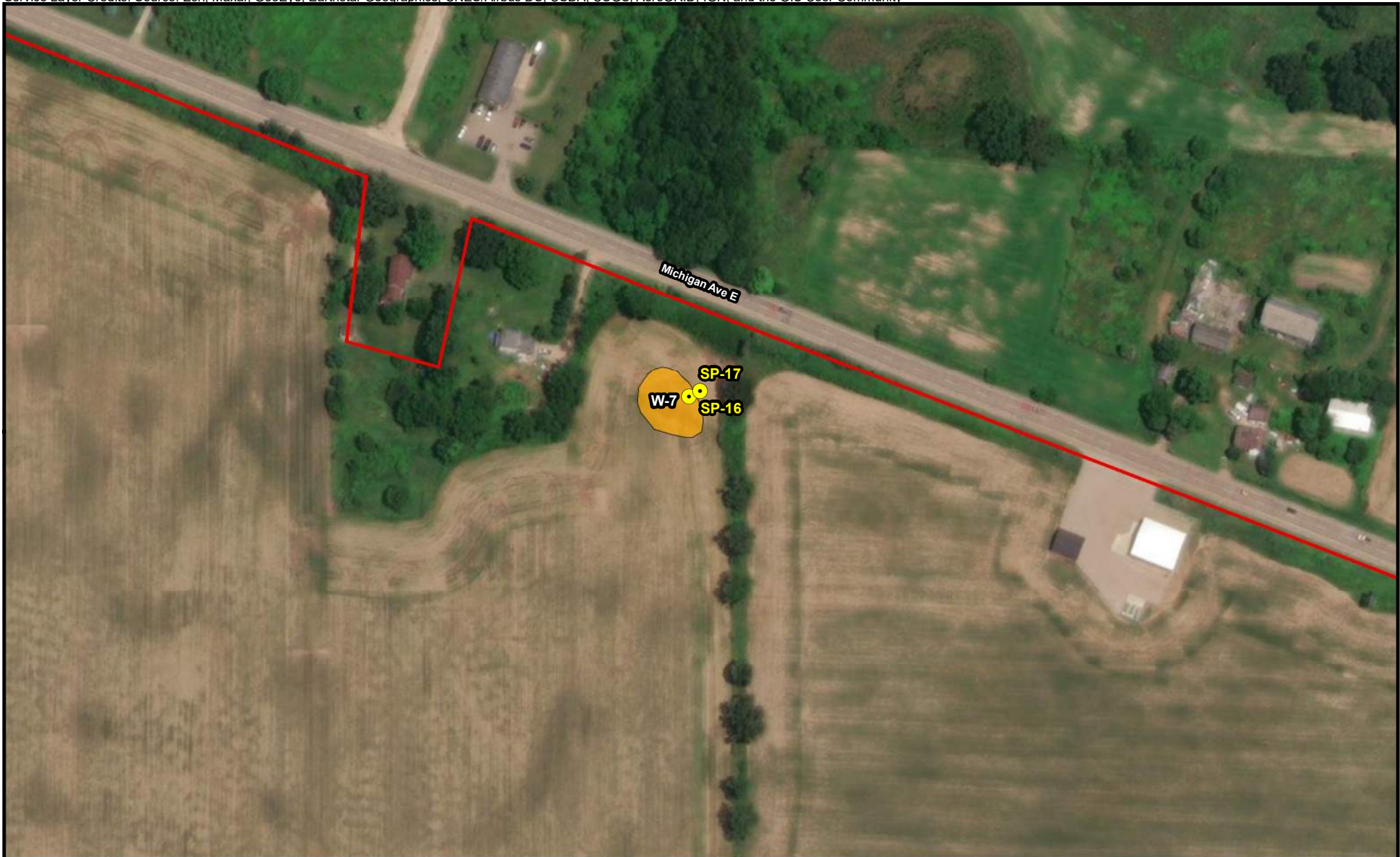


Figure 3
Land Cover Map
Marshall Mega Site
Calhoun County, MI



<p>Survey Area</p> <p>Sample Plot</p> <p>Stream</p>	<p>Stream (S)</p> <p>Perennial</p> <p>Intermittent</p>	<p>Wetland (W)</p> <p>PEM</p> <p>PEM/PSS</p> <p>PEMf</p>				<p>Figure 4 Wetland Delineation Map Marshall Mega Site Calhoun County, MI Page 1 of 11</p>
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Survey Area	Stream (S)	Wetland (W)
Sample Plot	Perennial	PEM
Stream	Intermittent	PEM/PSS
		PEMf

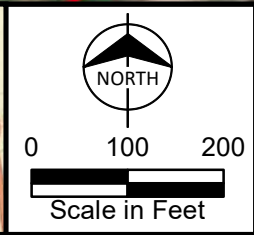


Figure 4
 Wetland Delineation Map
 Marshall Mega Site
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Survey Area	Stream (S)	Wetland (W)
Sample Plot	Perennial	PEM
Stream	Intermittent	PEM/PSS
		PEMf

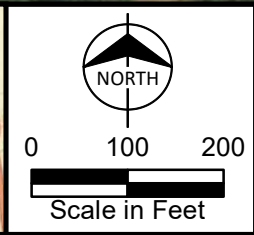


Figure 4
Wetland Delineation Map
Marshall Mega Site
Calhoun County, MI
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Survey Area	Stream (S)	Wetland (W)
Sample Plot	Perennial	PEM
Stream	Intermittent	PEM/PSS
		PEMf

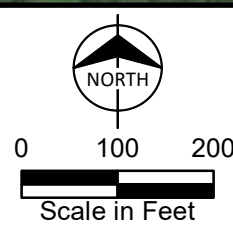


Figure 4
 Wetland Delineation Map
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|-------------|-------------------|--------------------|
| Survey Area | Stream (S) | Wetland (W) |
| Sample Plot | Perennial | PEM |
| Stream | Intermittent | PEM/PSS |
| | | PEMf |

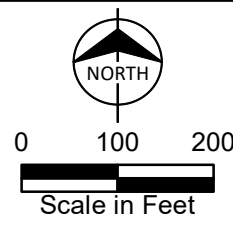


Figure 4
Wetland Delineation Map
Marshall Mega Site
Calhoun County, MI
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Survey Area	Stream (S)	Wetland (W)
Sample Plot	Perennial	PEM
Stream	Intermittent	PEM/PSS
		PEMf

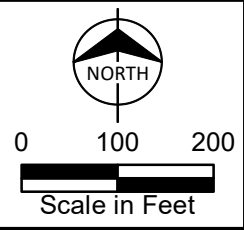


Figure 4
 Wetland Delineation Map
 Marshall Mega Site
 Calhoun County, MI
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Survey Area	Stream (S)	Wetland (W)
Sample Plot	Perennial	PEM
Stream	Intermittent	PEM/PSS
		PEMf

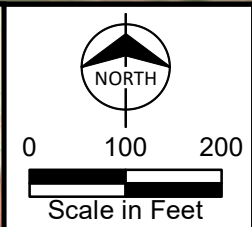
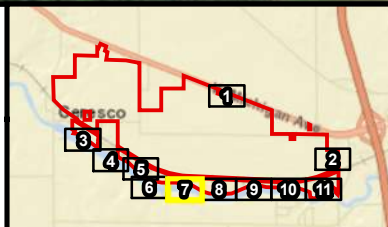


Figure 4
Wetland Delineation Map
Marshall Mega Site
Calhoun County, MI
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Survey Area	Stream (S)	Wetland (W)
Sample Plot	Perennial	PEM
Stream	Intermittent	PEM/PSS
		PEMf

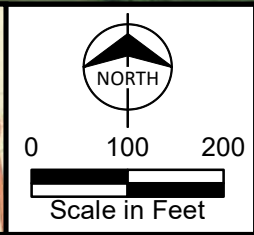
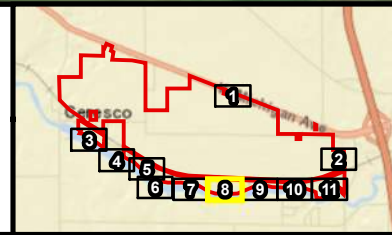
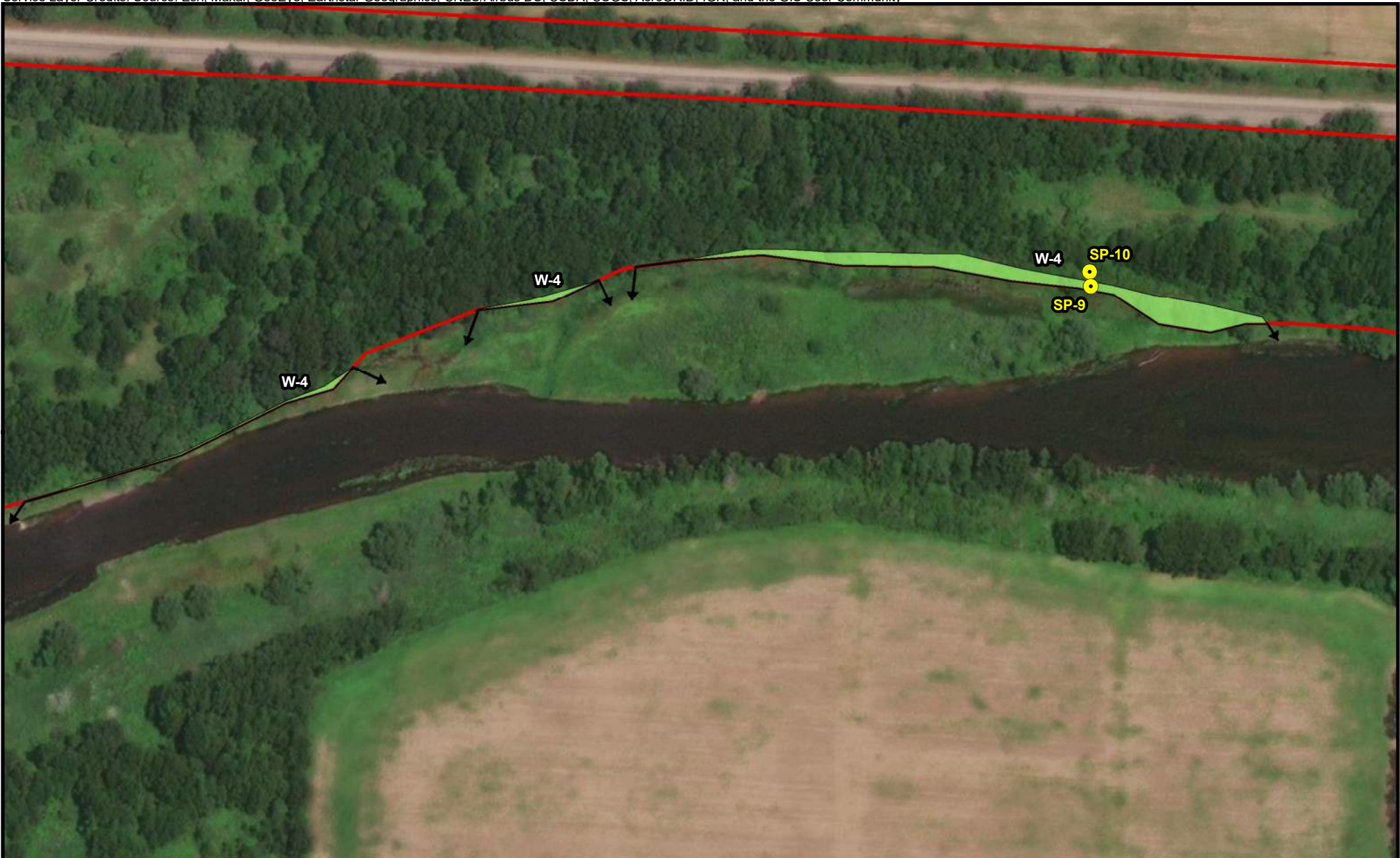


Figure 4
 Wetland Delineation Map
 Marshall Mega Site
 Calhoun County, MI
 Page 8 of 11



Survey Area	Stream (S)	Wetland (W)
Sample Plot	Perennial	PEM
Stream	Intermittent	PEM/PSS
		PEMf

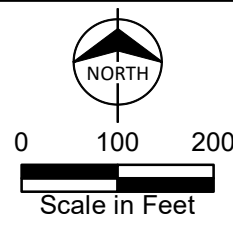
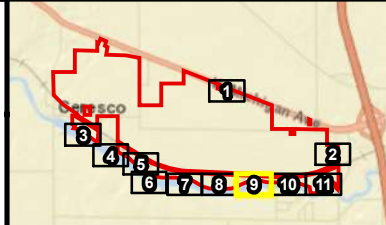


Figure 4
Wetland Delineation Map
Marshall Mega Site
Calhoun County, MI
Page 9 of 11



Survey Area	Stream (S)	Wetland (W)
Sample Plot	Perennial	PEM
Stream	Intermittent	PEM/PSS
		PEMf

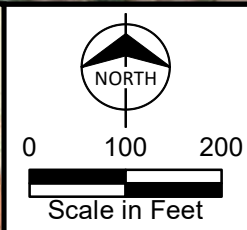
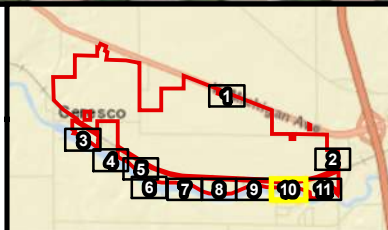
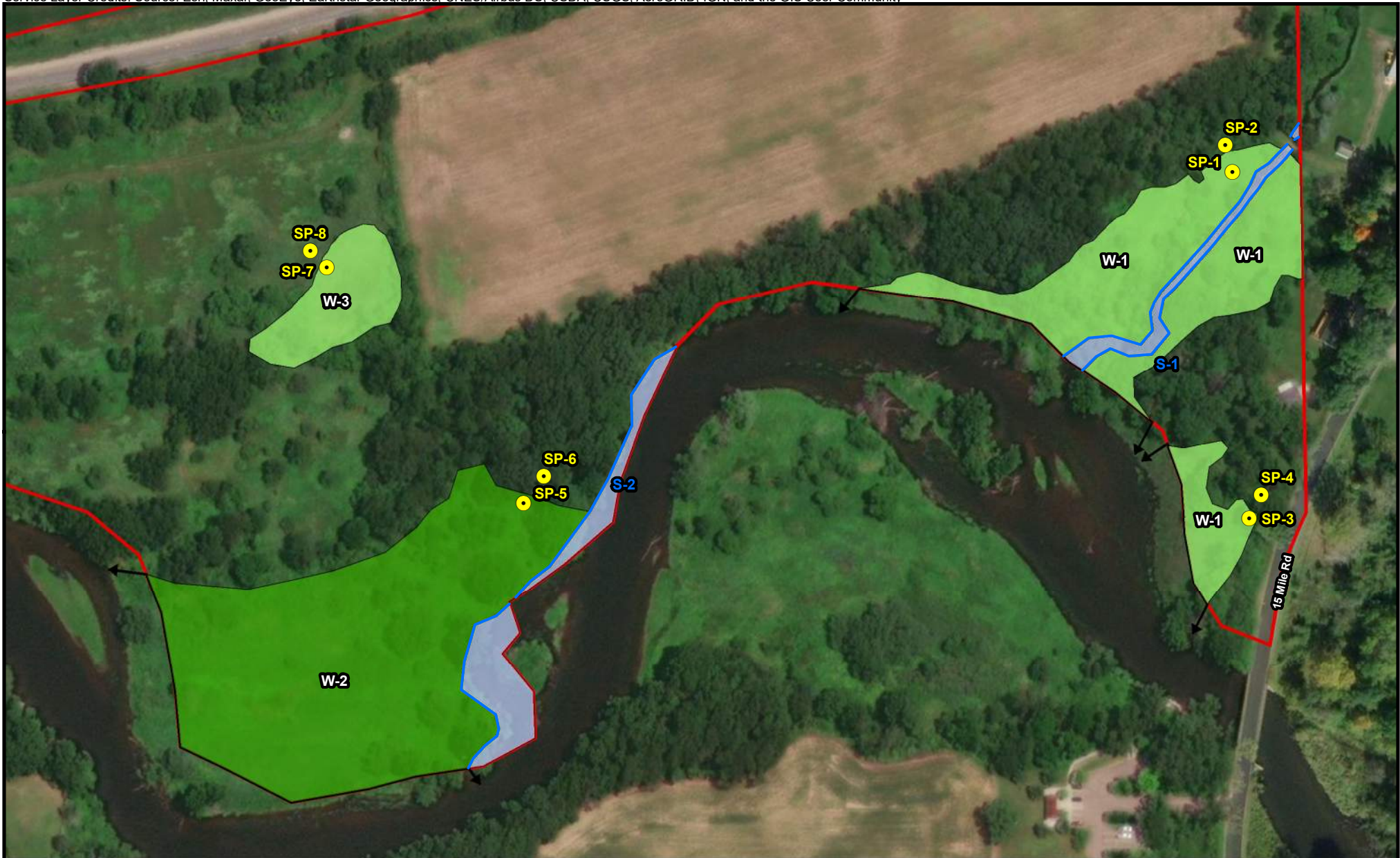


Figure 4
Wetland Delineation Map
Marshall Mega Site
Calhoun County, MI
Page 10 of 11



Survey Area	Stream (S)	Wetland (W)
Sample Plot	Perennial	PEM
Stream	Intermittent	PEM/PSS
		PEMf

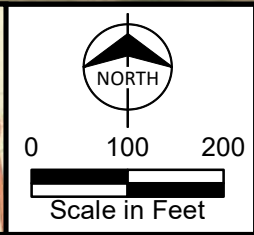
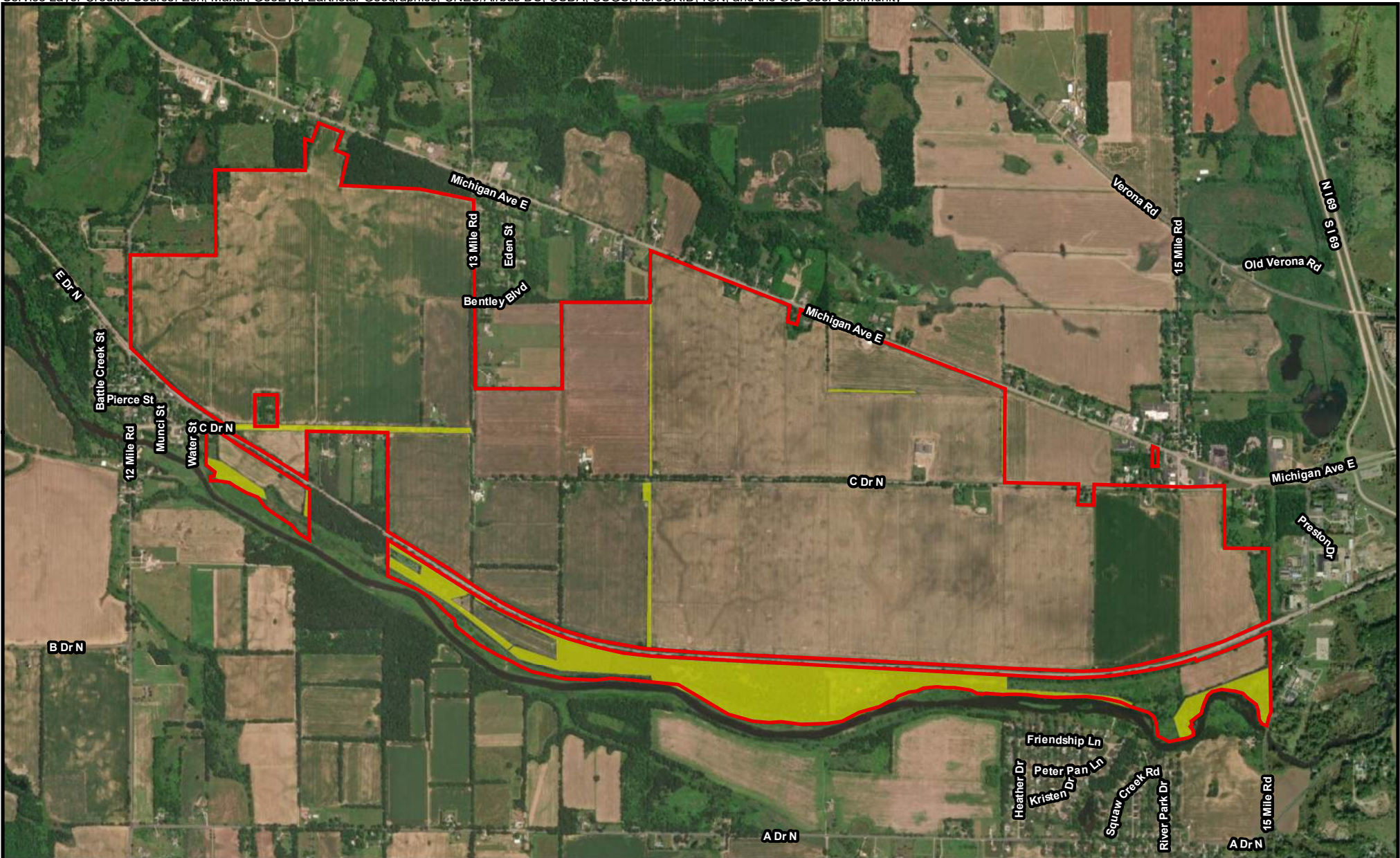


Figure 4
 Wetland Delineation Map
 Marshall Mega Site
 Calhoun County, MI
 Page 11 of 11



- Survey Area
- Potential Bat Habitat

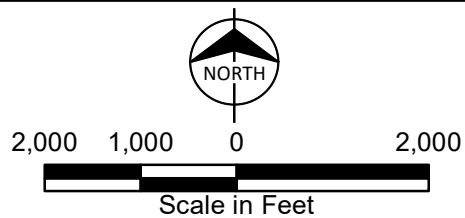


Figure 5
Potential Bat Habitat Map
Marshall Mega Site
Calhoun County, MI

**APPENDIX B - AGENCY
COORDINATION**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Calhoun County, Michigan



Local office

Michigan Ecological Services Field Office

☎ (517) 351-2555

📠 (517) 351-1443

2651 Coolidge Road Suite 101

East Lansing, MI 48823-6360

<http://www.fws.gov/midwest/EastLansing/>

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species¹ and their critical habitats are managed by the [Ecological Services Program](#) of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries²).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact [NOAA Fisheries](#) for [species under their jurisdiction](#).

1. Species listed under the [Endangered Species Act](#) are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the [listing status page](#) for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Indiana Bat <i>Myotis sodalis</i> Wherever found There is final critical habitat for this species. The location of the critical habitat is not available. http://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> Wherever found No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/9045	Threatened

Reptiles

NAME	STATUS
Eastern Massasauga (=rattlesnake) <i>Sistrurus catenatus</i> Wherever found This species only needs to be considered if the following condition applies: <ul style="list-style-type: none"> • For all Projects: Project is within EMR Range No critical habitat has been designated for this species. http://ecos.fws.gov/ecp/species/2202	Threatened

Insects

NAME	STATUS
------	--------

Monarch Butterfly *Danaus plexippus*

Wherever found

No critical habitat has been designated for this species.

<http://ecos.fws.gov/ecp/species/9743>

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described [below](#).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>
- Measures for avoiding and minimizing impacts to birds <http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>
- Nationwide conservation measures for birds <http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf>

The birds listed below are birds of particular concern either because they occur on the [USFWS Birds of Conservation Concern](#) (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ [below](#). This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the [E-bird data mapping tool](#) (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found [below](#).

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME

BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Bald Eagle *Haliaeetus leucocephalus*

This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.

<http://ecos.fws.gov/ecp/species/1626>

Breeds Dec 1 to Aug 31

Bobolink *Dolichonyx oryzivorus*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 20 to Jul 31

Lesser Yellowlegs *Tringa flavipes*

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<http://ecos.fws.gov/ecp/species/9679>

Breeds elsewhere

Red-headed Woodpecker *Melanerpes erythrocephalus*
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 10 to Sep 10

Rusty Blackbird *Euphagus carolinus*
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA

Breeds elsewhere

Wood Thrush *Hylocichla mustelina*
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Breeds May 10 to Aug 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)

Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

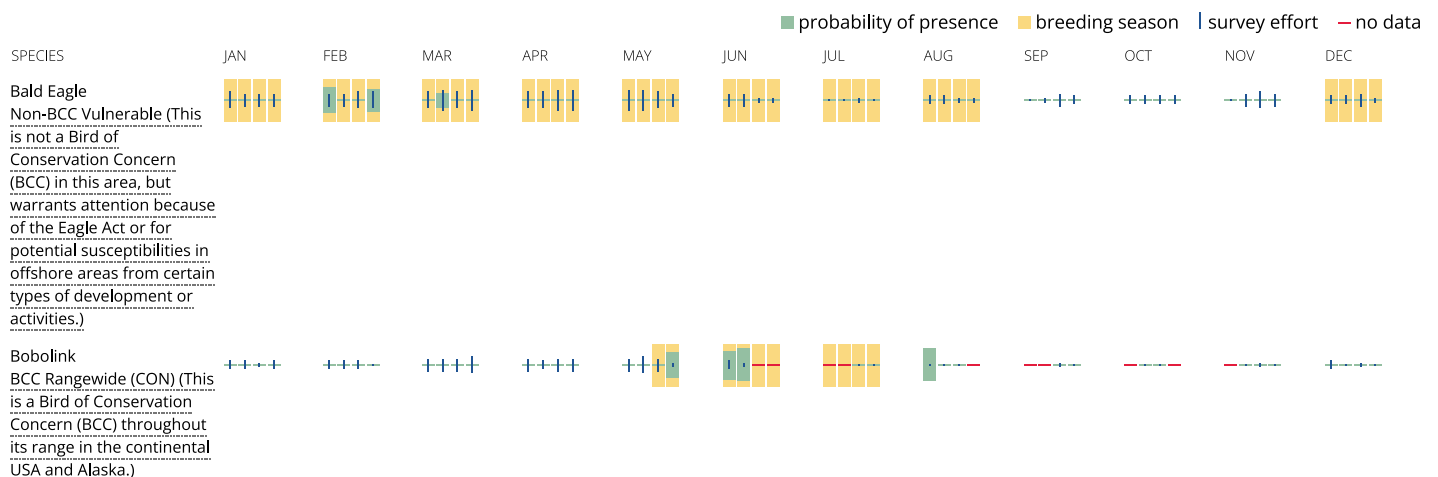
To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (-)

A week is marked as having no data if there were no survey events for that week.

Survey Timeframe

Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



<p>Lesser Yellowlegs BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)</p>	++++	+++-	++++	++ +	++++	+- - -	- - - -	- - - -	- - - -	- - - -	- - - -	- - - -	
<p>Red-headed Woodpecker BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)</p>	++++	++ +	++++	++++							++++	- - - -	++++
<p>Rusty Blackbird BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)</p>	++++	++++	++++	++ +	++++	++++	- - - -	++++	- - - -	++++	++++		++++
<p>Wood Thrush BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)</p>	++++	++++	++++	++++						++++	++++	- - - -	- - - -

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

[Nationwide Conservation Measures](#) describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. [Additional measures](#) or [permits](#) may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS [Birds of Conservation Concern \(BCC\)](#) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the [Avian Knowledge Network \(AKN\)](#). The AKN data is based on a growing collection of [survey, banding, and citizen science datasets](#) and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle ([Eagle Act](#) requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the [AKN Phenology Tool](#).

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the [Avian Knowledge Network \(AKN\)](#). This data is derived from a growing collection of [survey, banding, and citizen science datasets](#).

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: [The Cornell Lab of Ornithology All About Birds Bird Guide](#), or (if you are unsuccessful in locating the bird of interest there), the [Cornell Lab of Ornithology Neotropical Birds guide](#). If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are [Birds of Conservation Concern](#) (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the [Eagle Act](#) requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the [Northeast Ocean Data Portal](#). The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the [NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf](#) project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the [Diving Bird Study](#) and the [nanotag studies](#) or contact [Caleb Spiegel](#) or [Pam Loring](#).

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to [obtain a permit](#) to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the [NWI map](#) to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tubercid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION

Rare Species Review #2995

Section 7 Comments

Burns & McDonnell

Marshall Megasite Solar Project

Calhoun County, MI

October 5, 2021

For projects involving Federal funding or a Federal agency authorization

The following information is provided to assist you with Section 7 compliance of the Federal Endangered Species Act (ESA). The ESA directs all Federal agencies "to work to conserve endangered and threatened species. Section 7 of the ESA, called "Interagency Cooperation, is the means by which Federal agencies ensure their actions, including those they authorize or fund, do not jeopardize the existence of any listed species."

The project falls within the range of four (4) federally listed species which have been identified by the U.S. Fish and Wildlife Service (USFWS) to occur in Calhoun County, Michigan.

Federally Endangered

Indiana bat - there appears to be suitable habitat within the 1.5-mile search buffer. Indiana bats (*Myotis sodalis*) are found only in the eastern United States and are typically confined to the southern three tiers of counties in Michigan. Indiana bats that summer in Michigan winter in caves in Indiana and Kentucky. This species forms colonies and forages in riparian and mature floodplain habitats. Nursery roost sites are usually located under loose bark or in hollows of trees near riparian habitat. Indiana bats typically avoid houses or other artificial structures and typically roost underneath loose bark of dead elm, maple and ash trees. Other dead trees used include oak, hickory and cottonwood. Foraging typically occurs over slow-moving, wooded streams and rivers as well as in the canopy of mature trees. Movements may also extend into the outer edge of the floodplain and to nearby solitary trees. A summer colony's foraging area usually encompasses a stretch of stream over a half-mile in length. Upland areas isolated from floodplains and non-wooded streams are generally avoided.

Management and Conservation: the suggested seasonal tree cutting range for Indiana bat is between October 1 and March 31 (i.e., no cutting April 1-September 30). This applies throughout the Indiana bat range in Michigan.

Mitchell's satyr butterfly – there does not appear to be suitable habitat within 1.5 miles of the project site. The federally endangered and state endangered Mitchell's satyr butterfly (*Neonympha mitchellii mitchellii*) is restricted to calcareous wetlands known as prairie fens. In Michigan, this habitat is characterized by scattered tamaracks, poison sumac, and dogwood with a ground cover of sedges, shrubby cinquefoil, and a variety of herbaceous species with prairie affinities. Adult Mitchell's satyr butterflies are active two to three weeks each summer, with males emerging before females. Adult flight dates are from mid-June to mid-July. Larvae hibernate near the bottom of a sedge. The larval food plant is thought to be several species of sedge. The caterpillar is green with white stripes.

Management and Conservation: the primary threat to the continued survival of this species is habitat loss and modification. Many of the wetland complexes occupied currently have been altered or drained for agriculture or development. Wetland alteration is responsible for extirpating the single known satyr population in Ohio. Wetland alteration also can lead to invasion by exotic plant species such as glossy buckthorn (*Rhamnus frangula*), purple loosestrife (*Lythrum salicaria*), common buckthorn (*Rhamnus cathartica*), and the common reed (*Phragmites australis*). In addition, landscape-scale processes that may be important for maintaining suitable satyr habitat and/or creating new habitat, such as wildfires, fluctuations in hydrologic regimes, and flooding from beaver (*Castor canadensis*) activity, have been virtually eliminated or altered throughout the species' range.

Federally Threatened

Northern long-eared bat - Northern long-eared bat (*M. septentrionalis*) numbers in the northeast US have declined up to 99 percent. Loss or degradation of summer habitat, wind turbines, disturbance to hibernacula, predation, and pesticides have contributed to declines in Northern long-eared bat populations. However, no other threat has been as severe to the decline as White-nose Syndrome (WNS). WNS is a fungus that thrives in the cold, damp conditions in caves and mines where bats hibernate. The disease is believed to disrupt the hibernation cycle by causing bats to repeatedly awake thereby depleting vital energy reserves. This species was federally listed in May 2015 primarily due to the threat from WNS.

Although no known hibernacula or roost trees have been documented within 1.5 miles of the project area, this activity occurs within the designated [WNS zone](#) (i.e., within 150 miles of positive counties/districts impacted by WNS). In addition, there appears to be suitable habitat within the buffer. The USFWS has prepared a [dichotomous key](#) to help determine if this action may cause prohibited take of this bat. Please consult the USFWS [Endangered Species Page](#) for more information.

Also called northern bat or northern myotis, this bat is distinguished from other *Myotis* species by its long ears. In Michigan, northern long-eared bats hibernate in abandoned mines and caves in the Upper Peninsula; they also commonly hibernate in the Tippy Dam spillway in Manistee County. This species is a regional migrant with migratory distance largely determined by locations of suitable hibernacula sites.

Northern long-eared bats typically roost and forage in forested areas. During the summer, these bats roost singly or in colonies underneath bark, in cavities or in crevices of both living and dead trees. Roost trees are selected based on the suitability to retain bark or provide cavities or crevices. Common roost trees in southern Lower Michigan include species of ash, elm and maple. Foraging occurs primarily in areas along woodland edges, woodland clearings and over small woodland ponds. Moths, beetles and small flies are common food items. Like all temperate bats this species typically produces only 1-2 young per year.

Management and Conservation: when there are no known roost trees or hibernacula in the project area, we encourage you to conduct tree-cutting activities and prescribed burns in forested areas during October 1 through March 31 when possible, but you are not required by the ESA to do so. When that is not possible, we encourage you to remove trees prior to June 1 or after July 31, as that will help to protect young bats that may be in forested areas but are not yet able to fly.

Eastern massasauga rattlesnake (EMR) – this project falls outside of Tier 1 or Tier 2 EMR habitat as designated by the US Fish and Wildlife Service. The federally threatened and state special concern eastern massasauga rattlesnake (*Sistrurus catenatus*) is Michigan's only venomous snake and is found in a variety of wetland habitats including bogs, fens, shrub swamps, wet meadows, marshes, moist grasslands, wet prairies, and floodplain forests. This snake occurs throughout the Lower Peninsula but is not found in the Upper Peninsula. Populations in southern Michigan are typically associated with open wetlands, particularly prairie fens, while those in northern Michigan are better known from lowland coniferous forests, such as cedar swamps. These snakes normally overwinter in crayfish or small mammal burrows often close to the groundwater level and emerge in spring as water levels rise. During late spring, these snakes move into adjacent uplands they spend the warmer months foraging in shrubby fields and grasslands in search of mice and voles, their favorite food.

Often described as “shy and sluggish”, these snakes avoid human confrontation and are not prone to strike, preferring to leave the area when they are threatened. However, like any wild animal, they will protect themselves from anything they see as a potential predator. Their short fangs can easily puncture skin and they do possess potent venom. Like many snakes, the first human reaction may be to kill the snake, but it is important to remember that all snakes play vital roles in the ecosystem. Some may eat harmful insects. Others like the massasauga consider rodents a delicacy and help control their population. Snakes are also a part of a larger food web and can provide food to eagles, herons, and several mammals.

Management and Conservation: any sightings of these snakes should be reported to the Michigan Department of Natural Resources, Wildlife Division. If possible, a photo of the live snake is also recommended.

Monarch Butterfly (*Danaus plexipuss*) on December 15, 2020, the U.S. Fish and Wildlife Service announced that listing the monarch as endangered or threatened under the Endangered Species Act is warranted but precluded by higher priority listing actions. The decision is the result of an extensive status review of the monarch that compiled and assessed the monarch's current and future status. The monarch is now a candidate under the Endangered Species Act; we will review its status annually until a listing decision is made.

Management and Conservation: neither section 7 of the Endangered Species Act nor the implementing regulations for section 7 contain requirements for federal agencies with respect to candidate species. Habitat loss and fragmentation has occurred throughout the monarch's range. Pesticide use can destroy the milkweed monarchs need to survive. A changing climate has intensified weather events which may impact monarch populations.

USFWS Section 7 Consultation Technical Assistance can be found at:

<https://www.fws.gov/midwest/endangered/section7/index.html>

The website offers step-by-step instructions to guide you through the Section 7 consultation process with prepared templates for documenting "no effect." as well as requesting concurrence on "may affect, but not likely to adversely affect" determinations.

Please let us know if you have questions.

Mike Sanders
Environmental Review Specialist/Zoologist
Sander75@msu.edu
Cell: 517-980-5632

Mr. Jacob Tinus
Burns & McDonnell
7-57 Wells Avenue
Second Floor, Suite 27
Newton, MA 02459

October 5, 2021

**Re: Rare Species Review #2995 – Marshall Megasite Solar Development Project,
Calhoun County, MI.**

Mr. Tinus:

The location for the proposed project was checked against known localities for rare species and unique natural features, which are recorded in the Michigan Natural Features Inventory (MNFI) natural heritage database. This continuously updated database is a comprehensive source of existing data on Michigan's endangered, threatened, or otherwise significant plant and animal species, natural plant communities, and other natural features. Records in the database indicate that a qualified observer has documented the presence of special natural features. The absence of records in the database for a site may mean that the site has not been surveyed. The only way to obtain a definitive statement on the status of natural features is to have a competent biologist perform a complete field survey.

Under Act 451 of 1994, the Natural Resources and Environmental Protection Act, Part 365, Endangered Species Protection, "a person shall not take, possess, transport, ...fish, plants, and wildlife indigenous to the state and determined to be endangered or threatened," unless first receiving an Endangered Species Permit from the Michigan Department of Natural Resources (MDNR), Wildlife Division. Responsibility to protect endangered and threatened species is not limited to the lists below. Other species may be present that have not been recorded in the database.



MSU EXTENSION

**Michigan Natural
Features Inventory**

PO Box 13036
Lansing MI 48901

(517) 284-6200
Fax (517) 373-9566

mnfi.anr.msu.edu

MSU is an affirmative-
action, equal-opportunity
employer.

Several at-risk species have been documented within 1.5 miles of the proposed activity and **it is possible that negative impacts will occur**. This response reflects a desktop review of the database and MNFI cannot fully evaluate this project without visiting the area. MNFI offers several levels of [Rare Species Reviews](#), including field surveys which I would be happy to discuss with you.

Sincerely,

Michael A. Sanders

Michael A. Sanders
Environmental Review Specialist/Zoologist
Michigan Natural Features Inventory

Comments for Rare Species Review #2995:

It is the applicant’s responsibility to comply with both state and federal threatened and endangered species legislation. Therefore, if a state listed species occurs at a project site, and you think you need an endangered species permit please contact: Casey Reitz, DNR-Wildlife Division, 517-284-6210, or ReitzC@michigan.gov. If a federally listed species is involved and, you think a permit is needed, please contact Chris Mensing, Fish and Wildlife Biologist, U.S. Fish and Wildlife Service, East Lansing office, 517-351-8316, or Chris.Mensing@fws.gov.

NOTE: special concern species and natural communities are not protected under endangered species legislation, but efforts should be taken to minimize any or all impacts.

Please consult MNFI’s [Rare Species Explorer](#) for additional information on Michigan’s rare plants and animals.

Table 1: Occurrences of threated and endangered species within 1.5 miles of RSR #2995

ELCAT	SNAME	SCOMNAME	USESA	SPROT	G_RANK	S_RANK	FIRSTOBS	LASTOBS
Animal	<i>Speyeria idalia</i>	Regal fritillary		E	G3?	SH	1949	1949-07-30
Animal	<i>Cryptotis parva</i>	Least shrew		T	G5	S1S2	1929	1929-05-28
Animal	<i>Ligumia recta</i>	Black sandshell		E	G4G5	S1?	2012-07-10	2012-07-10
Plant	<i>Zizania aquatica</i>	Wild rice		T	G5	S2S3	1954	1954-08-18
Plant	<i>Viola pedatifida</i>	Prairie birdfoot violet		T	G5	S1	1980	1981-05-25
Plant	<i>Hydrastis canadensis</i>	Goldenseal		T	G3G4	S2	1964-05-11	1964-05-11
Plant	<i>Filipendula rubra</i>	Queen-of-the-prairie		T	G4G5	S2	2011-09-23	2011-09-23
Plant	<i>Eryngium yuccifolium</i>	Rattlesnake-master or button snakeroot		T	G5	S2	2019-05-29	2019-05-29
Plant	<i>Silphium integrifolium</i>	Rosinweed		T	G5	S2	2019-08-19	2019-08-19
Plant	<i>Silphium perfoliatum</i>	Cup plant		T	G5	S2	2019-08-22	2019-08-22

Comments for Table 1:

Queen-of-the-prairie - the state threatened queen-of-the-prairie (*Filipendula rubra*) has been known to occur in the area between the Kalamazoo River and the Conrail RR tracks in Sections 29 & 30 of T02S R06W. This species inhabits prairie fens, wet prairies, wet meadows, and low woods, most commonly in calcareous habitats. Flowering occurs late June to through mid-September.

Management and Conservation: this species benefits from fen management that includes prescribed fire and brush removal, which maintains open habitat and reduces competing woody vegetation. Control invasive species, especially glossy buckthorn, a common invader of this type of habitat. Protect habitat from being drained and developed.

Rattlesnake-master or button snakeroot – the state threatened (ST) rattlesnake-master (*Eryngium yuccifolium*) has been known to occur in the area between the Kalamazoo River and the Conrail RR tracks in Sections 29 & 30 of T02S R06W. This plant occurs in sedge and grass-dominated portions of prairie fen complexes, including thickets along stream drainages. Also found in sandy soils and wet prairies in former oak savannas and oak barrens, often occurring in small remnants along power lines and railroad rights-of-way. The species likely occurred historically in a variety of prairie and savanna habitats. Plant associates include sensitive fern, golden-alexanders, white camass, Culver's root, and rosinweed. Survey period is from early July to late September.

Management and Conservation: maintain openings through use of prescribed fire, which will reduce vigorous woody plant competition.

Rosinweed – the state threatened (ST) rosinweed (*Silphium integrifolium*) has been known to occur in the area between the Kalamazoo River and the Conrail RR tracks in Sections 29 & 30 of T02S R06W. Rosinweed occurs in prairie remnants along roads and railroad tracks or in cemeteries, in wet-mesic prairies and fens on peaty mucks and loams, and on dry-mesic to mesic loams and sandy loams. Associates include big bluestem, little bluestem, cordgrass, prairie coreopsis, wild geranium, and pale-leaved sunflower. Survey period is from early July to late September.

Management and Conservation: much of this habitat type has been lost or severely degraded. Many prairie remnants are vulnerable to common right-of-way maintenance activities such as mowing, herbiciding, and bulldozing.

Cup Plant - the state threatened cup plant (*Silphium perfoliatum*) has been known to occur in the area between the Kalamazoo River and the Conrail RR tracks in Sections 29 & 30 of T02S R06W. In Michigan, cut-plant is found in river floodplains in forest openings and edges. Recommended survey time ranges from first week of July to fourth week of October.

Management and Conservation: conserve hydrology of river system and corresponding cyclical floodplain regime. Maintain healthy intact, mature floodplain forests and minimize forest fragmentation. When possible, leave large tracts of unharvested forests and allow natural processes to operate unhindered.

Table 2: Occurrences of special concern species & natural features within 1.5 miles of RSR #2995

ELCAT	SNAME	SCOMNAME	USESA	SPROT	G_RANK	S_RANK	FIRSTOBS	LASTOBS
Animal	<i>Notropis texanus</i>	Weed shiner		X	G5	S1	1928-11-30	1929-10-01
Animal	<i>Alasmidonta marginata</i>	Elktoe		SC	G4	S3?	1934-09	2012-07-11
Animal	<i>Emydoidea blandingii</i>	Blanding's turtle		SC	G4	S2S3	2005-06-13	2012-06-07
Animal	<i>Venustaconcha ellipsiformis</i>	Ellipse		SC	G4	S3	1929	1929
Animal	<i>Venustaconcha ellipsiformis</i>	Ellipse		SC	G4	S3	1929	2012-07-19
Animal	<i>Pleurobema sintoxia</i>	Round pigtoe		SC	G4G5	S3	1934-09	2012-07-11
Animal	<i>Villosa iris</i>	Rainbow		SC	G5	S3	1929	2012-07-11
Animal	<i>Lasmigona compressa</i>	Creek heelsplitter		SC	G5	S3	1929	2000-09-15
Animal	<i>Lasmigona costata</i>	Flutedshell		SC	G5	SNR	1929	2018-07-26
Animal	<i>Lasmigona costata</i>	Flutedshell		SC	G5	SNR	2012-07-09	2012-07-19
Animal	<i>Alasmidonta marginata</i>	Elktoe		SC	G4	S3?	2012-07-09	2012-07-09
Plant	<i>Angelica venenosa</i>	Hairy angelica		SC	G5	S3	1898	1898-08-02
Plant	<i>Baptisia lactea</i>	White or prairie false indigo		SC	G4Q	S3	1969	2009-07-02

Comments for Table 2:

NOTE: special concern species and natural communities are not protected under endangered species legislation, but efforts should be taken to minimize any or all impacts.

Several rare freshwater mussels have been documented in this stretch of the Kalamazoo River. Freshwater mussels (*Unionida*) require a fish host to complete their life cycle. Eggs are fertilized and develop into larvae within the gills of the female mussel. These larvae, called glochidia, are released into the water and must attach to a suitable fish host to survive and transform into the adult mussel. As zebra mussel (*Dreissena polymorpha*) infestation has led to the extirpation of many native mussel communities, boat hulls and trailers, fishing gear

and scuba equipment should be thoroughly cleaned before moving between waterbodies, to prevent the spread of zebra mussel larvae and adults.

Elktoe - the state special concern elktoe mussel (*Alasmidonta marginata*) has been known to occur in the Kalamazoo River. This species is found in clean, clear rivers with gravel or rocky bottoms and swift currents. It is a riffle species, preferring swifter currents over packed sand and gravel substrates. Known host fish include the white sucker (*Catostomus commersoni*), northern hog sucker (*Hypentelium nigricans*), and the shorthead redhorse (*Moxostoma macrolepidotum*).

Management and Conservation: the elktoe needs clean, fast-flowing water to survive. Therefore, changes to its habitat, such as river impoundment, siltation and channel disturbances, including dredging, negatively affect this species. Pollution from point (industrial and residential discharge) and non-point (siltation, herbicide and surface run-off) sources is also a threat to mussels. It is essential to protect not only the habitat of the elktoe, but also that of its' host fish.

Ellipse – the state special concern ellipse mussel (*Venustaconcha ellipsiformis*) has been known to occur in the Kalamazoo River. The ellipse mussel inhabits small to medium streams and can be found in firm sand and gravel where moderate currents prevail. The host fish is unknown. The ellipse is known only from the Midwest United States and has declined considerably in its historic distribution and abundance due to habitat alterations, modification in river flows, and pollution.

Management and Conservation - like other mussels, threats to the ellipse include: natural flow alterations, siltation, channel disturbance, point and non-point source pollution, and exotic species. Maintenance or establishment of vegetated riparian buffers can help protect mussel habitats from many of their threats. And as with all mussels, protection of their hosts habitat is also crucial.

Round pigtoe - the state special concern round pigtoe mussel (*Pleurobema sintoxia*) has been known to occur in the Kalamazoo River. Round pigtoe mussels inhabit medium sized to large rivers. They are found on sand or mud in sparsely vegetated areas with a moderate current. Bluegill (*Lepomis macrochirus*) are believed to be the host fish for round pigtoe.

Management and Conservation - like other mussels, threats include natural flow alterations, siltation, channel disturbance, point and non-point source pollution, and exotic species. Maintenance or establishment of vegetated riparian buffers can help protect mussel habitats from many of their threats.

Rainbow - the state special concern rainbow mussel (*Villosa iris*) has been known to occur in the Kalamazoo River. Rainbow mussels inhabit small to medium streams in coarse sand or gravel where moderate currents prevail. Likely fish hosts include smallmouth bass, green sunfish, largemouth bass, rainbow darter, and yellow perch.

Management and Conservation: like other mussels, threats to the rainbow include natural flow alterations, siltation, channel disturbance, point and non-point source pollution, and exotic species. Maintenance or establishment of vegetated riparian buffers can help protect mussel habitats from many of their threats. And as with all mussels, protection of their hosts habitat is also crucial.

Creek heelsplitter – the state special concern creek heelsplitter (*Lasmigona compressa*) has been known to occur in the area. Creek heelsplitter are normally found in creeks and the headwaters of small to medium rivers in fine gravel or sand.

Management and Conservation – threats to the species include water pollution, industrial and residential discharge, siltation, increased water temperatures and non-native species. All projects should implement proper upland managements such as contour farming and other soil erosion control methods.

Flutedshell – the state special concern flutedshell mussel (*Lasmigona costata*) has been known to occur in the Kalamazoo River. Fluted-shell mussels inhabit medium to large rivers in sand, mud, or fine gravel in areas with slow to moderate flow.

Management and Conservation – threats to the species include water pollution, industrial and residential discharge, siltation, increased water temperatures and non-native species. All projects should implement proper upland managements such as contour farming and other soil erosion control methods.

Blanding's turtle - the state special concern Blanding's turtle (*Emydoidea blandingii*) has been known to occur in the area. Blanding's turtles inhabit shallow bodies of water with some aquatic plant growth and a muddy bottom, such as marshes, ponds, swamps, lake inlets and coves, and river backwaters. Blanding's turtles are active from early April to late October. They are most often seen wandering overland in spring and fall. Females seeking nest sites may travel considerable distances and are commonly seen on or near roads. Most feeding occurs underwater and includes crayfish, insects, worms, leeches, snails, small fish, tadpoles, frogs, and some plants. Nesting occurs in June where eggs are buried in a sandy, sunny location. Hatchlings emerge in August or September. Blanding's turtles hibernate underwater (more rarely under debris close to water) from late October or early November until early April.

Management and Conservation: primary threats to the Blanding's turtles include loss or altering of wetland habitats and road mortality. The most critical conservation need for this species is protection and management of suitable wetland and adjacent upland habitats. Maintaining good water quality, restricting herbicide and pesticide use in or near wetlands, implementing minimum development set-back distances, leaving buffer zones during timber harvest, grazing and agricultural operations, and minimizing the construction of roads in or near suitable wetlands would be beneficial to this species.

As a species of special concern, the Blanding's turtle is not protected under state or federal endangered species legislation, but it is becoming rare throughout its range and it is protected under the authority of the Department of Natural Resources Director's Order, Regulations on the Take of Reptiles and Amphibians, dated October 12, 2001 (section 324 of PA 451).

White or prairie false indigo - the special concern white or prairie false indigo (*Baptisia lactea*) has been observed within the project footprint. White or prairie false indigo is a conspicuous glaucous (whitish), hairless, bushy herb a meter or taller, with showy white flowers and a large black pod. Over half the Michigan colonies for which habitat data have been reported are from very weedy, disturbed or successional sites, including fence rows, roadsides, railroad rights-of-way, dry ditches, and old fields. Most of these sites lie within the bounds of former prairies or savannas. Some colonies have been found in remnants of mesic prairie, most of which are also degraded and somewhat weedy, often persisting in unmowed portions of cemeteries and in railroad rights-of-way. This perennial flowers in July and fruits begin developing in August.

Management and Conservation: this species likely requires natural disturbances associated with prairie habitat such as fire or brush removal to prevent woody plant succession. Significant increases in vegetative and reproductive vigor have been observed following early spring and fall burns; late spring burns and summer can damage plants. Much of this habitat type has been lost or severely degraded. Many prairie remnants are vulnerable to common right-of-way maintenance activities such as mowing, herbiciding, and bulldozing.

Codes for Occurrence Tables:

State Protection Status Code Definitions (SPROT)

E: Endangered

T: Threatened

SC: Special concern

Federal Protection Status Code Definitions (USESA)

LE = listed endangered

LT = listed threatened

LELT = partly listed endangered and partly listed threatened

PDL = proposed delist

E(S/A) = endangered based on similarities/appearance

PS = partial status (federally listed in only part of its range)

C = species being considered for federal status

Global Heritage Status Rank Definitions (GRANK)

The priority assigned by [NatureServe](#)'s national office for data collection and protection based upon the element's status throughout its entire world-wide range. Criteria not based only on number of occurrences; other critical factors also apply. Note that ranks are frequently combined.

G1 = critically imperiled globally because of extreme rarity (5 or fewer occurrences range-wide or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction.

G2 = imperiled globally because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range.

G3: Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g. a single western state, a physiographic region in the East) or because of other factor(s) making it vulnerable to extinction throughout its range; in terms of occurrences, in the range of 21 to 100.

G4: Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.

G5: Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.

Q: Taxonomy uncertain

State Heritage Status Rank Definitions (SRANK)

The priority assigned by the Michigan Natural Features Inventory for data collection and protection based upon the element's status within the state. Criteria not based only on number of occurrences; other critical factors also apply. Note that ranks are frequently combined.

S1: Critically imperiled in the state because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extirpation in the state.

S2: Imperiled in state because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extirpation from the state.

S3: Rare or uncommon in state (on the order of 21 to 100 occurrences).

S4 = apparently secure in state, with many occurrences.

S5 = demonstrably secure in state and essentially ineradicable under present conditions.

SX = apparently extirpated from state.

APPENDIX C -PHOTOGRAPH LOG



Photograph C-1: Representative view of deciduous forest habitat comprised of red oak (*Quercus rubra*), black walnut (*Juglans nigra*), American basswood (*Tilia americana*), and muscle-wood (*Carpinus caroliniana*), facing west.



Photograph C-2: Representative view of suitable bat habitat tree, facing north.



Photograph C-3: Representative view of deciduous forest habitat comprised of oak sp. (*Quercus* sp.), black cherry (*Prunus serotina*), white ash (*Fraxinus americana*), and bitternut hickory (*Carya cordiformis*), with multiflora rose (*Rosa multiflora*) understory, facing northeast.



Photograph C-4: Representative view of a corn (*Zea mays*) agricultural field, facing north.



Photograph C-5: Representative view of a soybean (*Glycine max*) agricultural field, facing north.



Photograph C-6: Representative view of an open field, facing south.



Photograph C-7: Representative view of a palustrine emergent and palustrine shrub scrub wetland (Wetland [W]-4), facing west.



Photograph C-8: Representative view of a palustrine emergent wetland habitat (W-5), facing northeast.



Photograph C-9: Representative view of an intermittent stream (Stream [S]-3), facing south.



Photograph C-10: Representative view of the Kalamazoo River (S-2), facing east.