CDBG

### ENVIRONMENTAL ASSESSMENT FOR CDBG-FUNDED PROJECTS

Recommended format per 24 CFR 58.36, revised January 2014 [Previously recommended EA formats are obsolete].

Project Identification: Shelby Watermain Extension and Booster Station Project

Preparer: Hailey Marie Lyczynski, GIS Specialist, hlyczynski@fishbeck.com

Fishbeck, Kalamazoo East office - 2960 Interstate Parkway, Kalamazoo, Michigan 49048 (269) 342-1100

Responsible Entity: Township of Shelby - 204 N. Michigan Ave., P.O. Box 215, Shelby, Michigan 49455

Attn: Richard Raffaelli, Township Supervisor, (231) 861-5853

Month/Year: January 2023

#### **ENVIRONMENTAL ASSESSMENT**

Responsible Entity [24 CFR 58.2(a)(7)]	Township of Shelby
Certifying Officer [24 CFR 58.2(a)(2)]	Richard Raffaelli, Township Supervisor
Project Name	Shelby Watermain Extension and Booster Station Project
Project Location	Shelby, Michigan
Estimated total project cost	\$ 3.8 million
Grant Recipient [24 CFR 58.2(a)(5)]	Township of Shelby
Recipient Address	204 N. Michigan Ave., P.O. Box 215, Shelby, Michigan 49455
Project Representative	Richard Raffaelli, Township Supervisor
Telephone Number	(231) 861-5853

**Conditions for Approval:** (List all mitigation measures adopted by the responsible entity to eliminate or minimize adverse environmental impacts. These conditions must be included in project contracts and other relevant documents as requirements). [24 CFR 58.40(d), 40 CFR 1505.2(c)]

No mitigation measures are necessary in relation to this project as no long-term negative impacts are anticipated to result from the proposed actions.

FINDING: [58.40(g)]								
Finding of No Significant Impact  (The project will not result in a significant impact on the quality of the human environment.)								
Finding of Significant Impact (The project may significantly affect the quality of the human environment.)								
PREPARER SIGNATURE  AMAGNAM  Control of the control								
Hailey Marie Lyczynski, GIS Specialist, Fishbeck	Date	January 10, 2023						
RE APPROVING OFFICIAL SIGNATURE								
2. Ruffielle								
Richard Raffaelli, Township Supervior, Shelby Township	Date	May 5, 2023						

Statement of Purpose and Need for the Proposal:

[40 CFR 1508.9(b)]

Peterson Farms currently owns a total of nine apartment buildings, three of which are near the intersection of Baseline Road and Oceana Drive and six of which are at the intersection of Baseline Road and 88<sup>th</sup> Avenue. The apartment buildings are currently supplied potable water by on-site wells that were drilled for each building at the time of construction.

Peterson Farms is seeking to connect to municipal water and abandon their existing private well system in order to eliminate the risk of potential groundwater contamination.

**Description of the Proposal:** Include all contemplated actions, which logically are either geographically, or functionally a composite part of the project, regardless of the source of funding. [24 CFR 58.32, 40 CFR 1508.25]

Project name: Shelby Watermain Extension and Booster Station Project

Project type: Water-related Infrastructure Improvements

Project description: The proposed project includes the installation of a 2.71-mile-long (4.4-km) watermain extension from the Village of Shelby north into Shelby Township to Peterson Farms to connect nine apartment buildings to the Village of Shelby's water system. The watermain extension will be in the right-of-way but outside of the existing roadway. The project will also include a booster station near the intersection of West Weaver Road and 79<sup>th</sup> Avenue.

**Existing Conditions and Trends:** Describe the existing conditions of the project area and its surroundings, and trends likely to continue in the absence of the project. [24 CFR 58.40(a)]

The proposed actions for the project will take place within easements, road rights-of-ways, and municipally owned property. Land surrounding the project area is predominantly agricultural with scattered residences and farming facilities/food products suppliers. In the absence of the project, the apartment buildings will remain on private water supply wells. At the present, this is a viable source of water for the buildings. However, groundwater contamination is a potential threat from the surrounding agricultural land and food production facilities.

#### **ENVIRONMENTAL ASSESSMENT CHECKLIST**

[Environmental Review Guide HUD CPD 782, 24 CFR 58.40; Ref. 40 CFR 1508.8 &1508.27]

Evaluate the significance of the effects of the proposal on the character, features and resources of the project area. Enter relevant base data and verifiable source documentation to support the finding. Then enter the appropriate impact code from the following list to make a determination of impact.

#### **Impact Codes:**

- 1) No impact anticipated
- 2) Potentially beneficial
- 3) Potentially adverse
- 4) Requires mitigation
- 5) Requires project modification.

Note names, dates of contact, telephone numbers and page references.

Attach additional material as appropriate.

Note conditions or mitigation measures required.

LAND DEVELOPMENT	CODE	SOURCE OR DOCUMENTATION			
Conformance with Comprehensive	1	The project actions will take place within easements, road right-of-ways,			
Plans and Zoning		and municipally owned property designated for the project. No			
		intrusion to the surrounding areas is anticipated, and no violations of			
		zoning/planning codes were identified.			
Compatibility and Urban Impact	2	The project will have a benefitial urban impact to the project region.			
		The project actions will provide available municipal water to nine			
		apartment buildings, which are currently serviced by on-site wells. This			
		will reduce the potential for drinking water contamination to the			
		buildings. Additionally, any future developments will benefit from the			
		infrastructure expansions.			
Slope	1	There are no distinguishable slopes that will be negatively impacted by			
		the project actions. The project will take place in easements, existing			
		road right-of-ways, and municipally owned property designated for the			
		project. The ground has been previously disturbed, and no changes to			
		grading or slope are planned.			
Erosion	1	Precautionary measures will be taken during construction to minimize			
		the potential for erosion during and post-construction. The contractor			
		will be responsible for site grading to control runoff and any corrective			
		actions necessary during the construction process to maintain			
		temporary soil erosion and sedimentation control measures.			
Soil Suitability	1	The project will take place in easements, existing road right-of-ways,			
		and municipally owned property designated for the project. The ground			
		has been previously disturbed, and following construction the land will			
		be resurfaced (i.e., vegetation, concrete, etc.). The existing soils are			
		compatible for the project actions, and no long-term negative impacts			
	_	to the project site's soils are anticipated.			
Hazards and Nuisances including Site	1	The project does not involve significant hazards or nuisances. Potential			
Safety		hazards and nuisances from the proposed infrastructure work will be			
		kept to a minimum and will be consistent with typical light construction.			
Energy Consumption	1	The project will meet the current state and local codes concerning			
		energy consumption. Energy use during infrastructure work is expected			
		to be consistent with typical construction equipment.			

Noise Contribution to Community Noise Levels	1	The project construction work will take place during daylight hours and comply with the local noise ordinance. Noise generated will be common to light construction, and the impact to the environment will be negligible.
		The project will not increase residential density and will not increase the community noise levels on a long-term scale.
Air Quality Effects of Ambient Air Quality on Project and Contribution to Community Pollution Levels	1	Impacts to air quality from the proposed infrasturcture work will be kept to a minimum and will not be outside what is normal for light construction. The effects will be temporary, and no significant or long-term impacts to air quality will occur.
Environmental Design Visual Quality - Coherence, Diversity, Compatible Use and Scale	1	No long-term impacts to the visual quality of the environment are anticipated. Following construction of the watermain extension, the disturbed area will be returned to existing conditions (i.e., vegetation cover). The booster station will not negatively impact land use or the visual quality of the project site.

SOCIOECONOMIC	CODE	SOURCE OR DOCUMENTATION	
Demographic Character Changes	1	The project will not impact the demographic character of Shelby	
		Township as it will not change residential development and/or density.	
Displacement	1	The project will not cause any displacement as it will not impact	
		residential development and/or density.	
Employment and Income Patterns	1	The project will not impact employment and income patterns as it will	
		not change residential or commercial development.	

COMMUNITY FACILITIES AND SERVICES	CODE	SOURCE OR DOCUMENTATION		
Educational Facilities	1	The project will have no effect to educational facilities based upon the lack of change to residential density.		
Commercial Facilities	1	The project will have no negative impact to commercial facilities based upon the lack of change to residential density.		
Health Care	1	The project will not increase residential density and will not increase the demand for medical services over the existing development in the township.		
Social Services	1	The project will have no effect on social services available nor will it increase the demand for social services as residential density will not be affected.		
Solid Waste	1	Solid waste and recycling services will not be be impacted long-term by the project actions. During construction, crews will be responsible for cleanup and disposal of associated debris.		
Waste Water	1	Waste water services will not be impacted by the project as it is solely infrastructure improvements to the watermain systems.		
Storm Water	1	Storm water services will not be impacted by the project as it is solely infrastructure improvements to the watermain systems.		
Water Supply	2	The project will have a benefitial impact to the water supply for the project site. The project actions will provide available municipal water to nine apartment buildings, which are currently serviced by on-site wells. This will reduce the potential for drinking water contamination to		

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		the buildings. Additionally, any future developments will benefit from the infrastructure expansions.
Public Safety – Police	1	The project will not increase residential density and will not increase the demand for police department services over the existing development in the township.
Public Safety – Fire	2	The project region is serviced by the Shelby Benona Fire Department. With the watermain extension and addition of a new booster station, the residential developments will be better served in case of a fire emergency. The planned watermain extension was developed to provide adequate flow and meet the recommended fire flow codes.
Public Safety – Emergency Medical	1	The project will not increase residential density and will not increase the demand for emergency medical services over the existing development in the township.
Open Space and Recreation - Open Space	1	The project actions will take place within easements, road right-of-ways, and municipally owned property designated for the project. No open spaces for recreational or public use will be impacted by the project.
- Recreation	1	See above.
- Cultural Facilities	1	No cultural facilities will be impacted by the project as the actions will take place within municipally owned properties along public roadways.
Transportation	1	The project actions will take place within easements and road right-of-ways but outside the existing paved roads. Transportation capabilities of personal and/or commercial vehicle traffic may be temporarily inconvenienced during construction. However, the effects will be minimal with no long-term impacts anticipated.

NATURAL FEATURES	CODE	SOURCE OR DOCUMENTATION	
Water Resources	1	See Attachments 2, 3, and 4.	
Surface Water	1	See Attachments 2, 4, and 5.	
Unique Natural Features and	1	The project actions will take place within easements, existing road right-	
Agricultural Lands		of-ways, and municipally owned property designated for the project.	
		No additional intrusion to the surrounding area will occur. As such, n	
		farmland will be impacted by the proposed project.	
Vegetation and Wildlife	1	See Attachments 5 and 6.	

OTHER FACTORS	CODE	SOURCE OR DOCUMENTATION
Flood Disaster Protection Act [Flood	1	Since it was determined that the project is not in a floodplain, flood
Insurance] [§58.6(a)]		insurance is not applicable. See Attachment 7.
Airport Runway Clear Zone or Clear	1	Since it was determined that the project is not in the airport clear zone,
Zone Disclosure [§58.6(d)]		there are no notification requirements. See Attachment 8.
Coastal Barrier Resources Act/Coastal	1	Since no coastal zones are identified for Shelby Township in Oceana
Barrier Improvement Act [§58.6(c)]		County, this is not applicable. See Attachment 2.
Other Factors	N/A	

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#### SUMMARY OF FINDINGS AND CONCLUSIONS

#### ALTERNATIVES TO THE PROPOSED ACTION

**Alternatives and Project Modifications Considered** [24 CFR 58.40(e), Ref. 40 CFR 1508.9] (Identify other reasonable courses of action that were considered and not selected, such as other sites, design modifications, or other uses of the subject site. Describe the benefits and adverse impacts to the human environment of each alternative and the reasons for rejecting it.)

Alternative 1: Construct using only 8" watermain Potential Adverse Environmental Impacts: None

Reason for Rejection: Does not meet the recommended fire flow of 1,000 gpm

Alternative 2: Construct using only 12" watermain Potential Adverse Environmental Impacts: None

Reason for Rejection: Exceeds the recommended fire flow

Alternative 3: Construct using a combination of 12" watermain along Oceana Drive and 8" watermain along Baseline Road. Potential Adverse Environmental Impacts: None

Comes close to meeting the desired fire flow. Therefore, since the only water demand along Baseline Drive is the Oceana Acres Development, sizing the watermain as 8" still provides adequate flow and is considered the selected alternative for the proposed project.

#### No Action Alternative [24 CFR 58.40(e)]

(Discuss the benefits and adverse impacts to the human environment of not implementing the preferred alternative).

In the absence of the project, the apartment buildings will remain on private water supply wells. At the present, this is a viable source of water for the buildings. However, groundwater contamination is a potential threat from the surrounding agricultural land and food production facilities.

#### MITIGATION MEASURES RECOMMENDED [24 CFR 58.40(d), 40 CFR 1508.20]

(Recommend feasible ways in which the proposal or its external factors should be modified in order to minimize adverse environmental impacts and restore or enhance environmental quality.)

No mitigation measures are necessary for the proposed project as no long-term negative impacts are anticipated to result from the project's actions.

#### **ADDITIONAL STUDIES PERFORMED**

(Attach studies or summaries)

An Environmental Assessment was conducted in April 2021 by Michigan Rural Community Assistance Partnership for the proposed project under a different grant applicant (Village of Shelby). The Environmental Assessment is attached (Attachment 9).

#### LIST OF SOURCES, AGENCIES AND PERSONS CONSULTED

[40 CFR 1508.9(b)]

Richard Raffaelli, Township Supervisor, Township of Shelby, Michigan Scott Slagor, Cultural Resource Protection Manager, State Historic Preservation Office Coastal Zone Boundary Maps by county and township (michigan.gov) Sole Source Aquifers (arcgis.com)
National Wild and Scenic Rivers | www.rivers.gov |
National Wetlands Inventory (usgs.gov)
IPaC: Home (fws.gov)
National Flood Hazard Layer | FEMA.gov

## **Attachment 1**

#### **Historic Preservation**

Scott Slagor, Cultural Resource Protection Manager with the State Historic Preservation Office (SHPO), was consulted in September 2022 regarding previously granted approval for the project. Mr. Slagor stated that SHPO does not need to re-review the project based upon the lack of changes to the work being performed, to planned ground disturbance, and to the Area of Potential Effect (APE). The change in applicant does not constitute a need for a revised Section 106 application. The SHPO approval letter is attached below.

Scott Slagor Cultural Resource Protection Manager State Historic Preservation Office 300 N. Washington Square Lansing, Michigan 48913 (517) 335-9840



GRETCHEN WHITMER

### STATE OF MICHIGAN MICHIGAN STRATEGIC FUND STATE HISTORIC PRESERVATION OFFICE

MARK A. BURTON PRESIDENT

May 28, 2021

ANDREW GRANSKOG ENVIRONMENTAL COORDINATOR USDA RURAL DEVELOPMENT OFFICE 3001 COOLIDGE ROAD SUITE 200 EAST LANSING MI 48823

RE: ER-21-587 Village of Shelby Water Main Extension, Shelby, Oceana County (USDA)

Dear Mr. Granskog:

Under the authority of Section 106 of the National Historic Preservation Act of 1966, as amended, we have reviewed the above-cited undertaking at the location noted above. Based on the information provided for our review, the State Historic Preservation Officer (SHPO) concurs with the determination of USDA that <u>no historic properties are affected</u> within the area of potential effects of this undertaking.

This letter evidences USDA's compliance with 36 CFR § 800.4 "Identification of historic properties," and the fulfillment of USDA's responsibility to notify the SHPO, as a consulting party in the Section 106 process, under 36 CFR § 800.4(d)(1) "No historic properties affected." If the scope of work changes in any way, or if artifacts or bones are discovered, please notify this office immediately.

We remind you that federal agency officials or their delegated authorities are required to involve the public in a manner that reflects the nature and complexity of the undertaking and its effects on historic properties per 36 CFR § 800.2(d). The National Historic Preservation Act also requires that federal agencies consult with any Indian tribe and/or Tribal Historic Preservation Officer (THPO) that attach religious and cultural significance to historic properties that may be affected by the agency's undertakings per 36 CFR § 800.2(c)(2)(ii).

The State Historic Preservation Office is not the office of record for this undertaking. You are therefore asked to maintain a copy of this letter with your environmental review record for this undertaking.

If you have any questions, please contact Brian Grennell, Cultural Resource Management Coordinator, at 517-335-2721 or by email at GrennellB@michigan.gov. Please reference our project number in all communication with this office regarding this undertaking. Thank you for this opportunity to review and comment, and for your cooperation.

Sincerely.

Brian G. Grennell

Cultural Resource Management Coordinator

BGG:MJH:drt

Copy: Peter M. Tierney, Fleis & VandenBrink

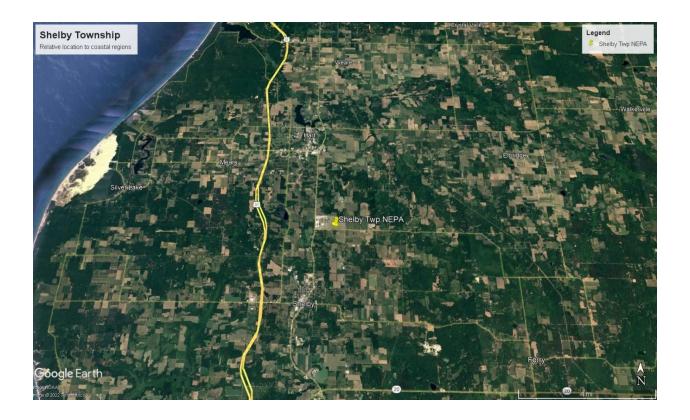
Brandon Gabler, Commonwealth Heritage Group, Inc.



## **Attachment 2**

#### **Coastal Zone Management**

No coastal zones are identified for Shelby Township, Oceana County by the State of Michigan Department of Environment, Great Lakes, and Energy (EGLE), Water Resources Division. Four townships within Oceana County are identified as having protected coastal zones (i.e., Benona, Clay Banks, Pentwater, and Golden townships). As such, no Coastal Zones will be impacted by the proposed project.



#### **Coastal Zone Boundary Maps**

If you would like assistance with these maps, please contact Ginny Berry, Coastal Management Unit, Field Operations Support Section, Water Resources Division (WRD), at <a href="mailto:BerryV@Michigan.gov">BerryV@Michigan.gov</a> or 517-284-5052 or Matt Warner, Coastal Management Unit, Field Operations Support Section, WRD, at <a href="mailto:WarnerM1@Michigan.gov">WarnerM1@Michigan.gov</a> or 517-388-5195.

Map listing - click the county name to go to those maps

#### Alcona

- Alcona and Haynes Townships
- Harrisville and Greenbush Townships

#### Alger

- Burt Township
- · Grand Island and Munising Townships, City of Munising
- Onota and Au Train Townships

#### <u>Allegan</u>

- Ganges and Casco Townships
- Laketown, Saugatuck and Manlius Townships and South Haven

#### Alpena

- Alpena Township and City of Alpena
- Alpena and Sanborn Townships

#### <u>Antri</u>m

- Banks and Torch Lake Townships
- Milton and Elk Rapids Townships

#### Arenac

- Standish, Arenac and Au Gres Townships
- Whitney, Sims and Au Gres Townships

#### Baraga

- Arvon Township
- Baraga and L' Anse Townships

#### Bav

- Bangor, Hampton, Merritt, Portsmouth and Frankenlust Townships, Bay City and Essexville
- Bangor, Kawkawlin and Fraser Townships
- Pinconning Township

#### **Benzie**

- Crystal Lake, Gilmore and Blaine Townships and City of Frankfort
- Lake Township

800-662-9278



#### Berrien

- Hagar, Benton and St. Joseph Townships and Benton Harbor and St. Joseph
- Lincoln and Lake Townships and the city of Bridgman
- New Buffalo and Chikaming Townships and New Buffalo

#### Charlevoix

- Bay, Charlevoix and Hayes Townships
- Beaver Island Group
- Eveline, South Arm, East Jordan, Evangeline and Wilson Townships and Boyne City
- Norwood Township

#### Cheboygan

- Benton Township and City of Cheboygan
- Mackinaw, Hebron and Beaugrand Townships

#### Chippewa

- Bay Mills Township
- Bruce and Soo (Nebbish Island) Townships
- Bay Mills, Superior and Soo Townships and Sault Ste. Marie
- Drummond Township
- Detour and Raber Townships
- Pickford and Raber Townships
- Sugar Island Township
- Whitefish Township

#### Delta

- Brampton, Escanaba and Wells Townships, Gladstone and Escanaba
- Ensign, Bay De Noc and Masonville Townships
- Fairbanks Township
- Ford River Township
- Garden and Nahma Townships

#### **Emmet**

- Readmond and Friendship Townships
- Wawatam, Bliss and Cross Village Townships
- West Traverse, Little Traverse, Bear Creek and Resort Townships, Petoskey and Harbor Springs

#### **Gogebic**

- Ironwood (East) and Wakefield Townships
- Ironwood (West) Township

#### **Grand Traverse**

- · Acme, East Bay and Garfield Townships and Traverse City
- Peninsula Township

#### **Houghton**

- Hancock and Calumet Townships
- Portage, Chassell and South part of Torch Lake Townships
- Stanton Township
- Schoolcraft, Osceola, Franklin, Portage and North part of Torch Lake Townships

#### Huron

- Fair Haven and Sebewaing Townships
- Sand Beach and Sherman Townships and Harbor Beach
- Huron, Gore and Rubicon Townships

- Lake, Caseville and McKinley Townships
- Pte. Aux Barques, Port Austin and Hume Townships

#### losco

- Baldwin, Tawas, Alabaster Townships and East Tawas and Tawas City
- Oscoda and Au Sable Townships

#### Keweenaw - mainland

- Allouez and Houghton Townships
- Eagle Harbor Township
- Grant Township
- Sherman Township

#### Keweenaw - Isle Royal

- Eagle Harbor Townships
- Houghton Townships

#### Leelanau

- Bingham and Elmwood Townships
- Leland, Leelanau and Suttons Bay Townships
- Cleveland, Glen Arbor and Empire Townships

#### Luce

- McMillan Township (eastern part)
- McMillan Township (western part)

#### Mackinac

- Bois Blanc Township
- Clark Township
- Garfield Township
- Hendricks and Hudson Townships
- Moran Township
- Marquette and St. Ignace Townships
- Newton Township

#### Macomb

• Chesterfield, Harrison, Clinton, and Lake Townships, Mt. Clemens and St. Clair Shores

#### Manistee

- Arcadia and Onekama Townships
- Filer, Manistee and Stronach Townships and Manistee

#### Marquette

- Marquette, Sands and Chocolay Townships
- Powell Township

#### <u>Mason</u>

- Grant, Hamlin and Victory Townships
- Pere Marquette, Amber, Riverton and Summit Townships and Ludington

#### Menominee

- Cedarville Township
- Ingallston Township
- Menominee Township and Menominee

#### Monroe

- Berlin, Frenchtown and Monroe Townships
- Erie, LaSalle and Monroe Townships

#### Muskegon

- Muskegon, Laketon and Fruitport Townships, the "Muskegons" and Norton Shores
- White River, Montague, Whitehall and Fruitland Townships, Montague and Whitehall

#### Oceana

- Benona and Clay Banks Townships
- Pentwater and Golden Townships

#### Ontonagon

- Bohemia and Ontonagon (east part) Townships
- Carp Lake Township
- Ontonagon (west part) Township

#### Ottawa

- Port Sheldon, Holland and Park Townships, Zeeland and Holland
- Spring Lake and Grand Haven Townships, Ferrysburg and Grand Haven

#### Presque Isle

- Bearinger and Ocqueoc Townships
- Presque Isle, Krakow and Pulawski Townships
- Rogers and Belknap Townships

#### Saginaw

• Kochville, Zilwaukee, Carrollton and Buena Vista Townships

#### Sanilac

- Delaware, Forest and Sanilac Townships
- Sanilac, Lexington and Worth Townships

#### **Schoolcraft**

- Mueller and Doyle Townships
- Manistique and Thompson Townships

#### St. Clair

- Burtchville and Fort Gratiot Townships and the city of Port Huron
- East China, Cottrellville, Clay and Ira Townships, Algonac and Marine-City
- St. Clair and East China Townships, Port Huron, Marysville and St. Clair

#### Tuscola

Akron and Wisner Townships

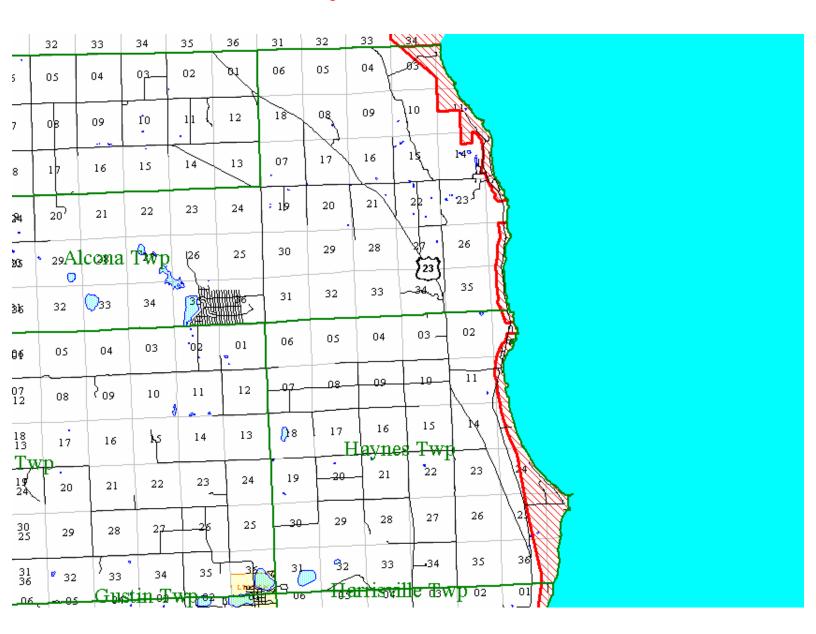
#### Van Buren

South Haven and Covert Townships and South Haven

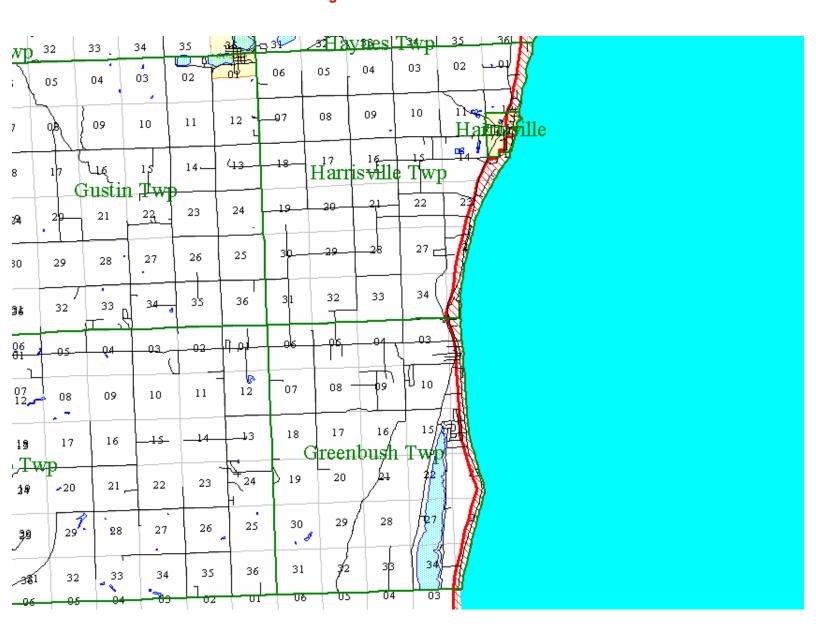
#### Wayne

- Brownstown and Grosse Ile Townships, Ecorse, Lincoln Park, Wyandotte, Riverview, Trenton, Rockwood and Gibraltar
- The "Grosse Points", Detroit and River Rouge

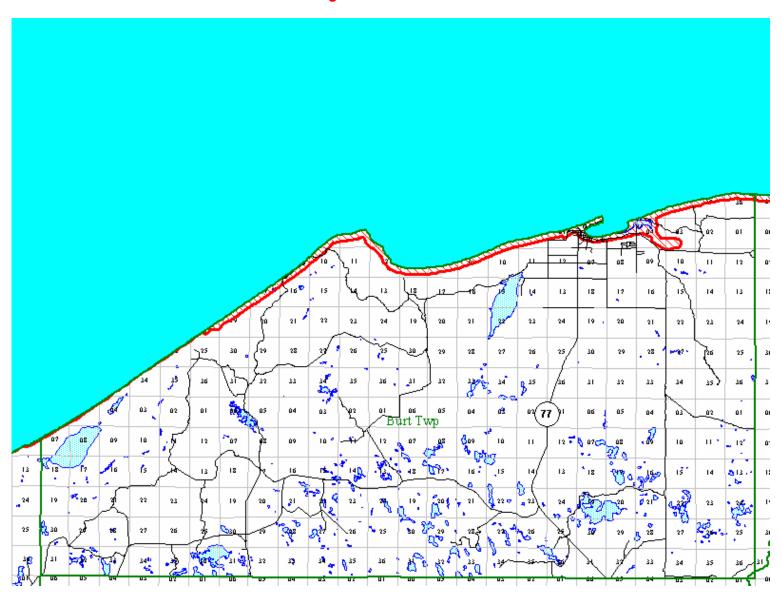
#### Alcona County Alcona Township, T28N R9E Haynes Township, T27N R9E and T27 R10E



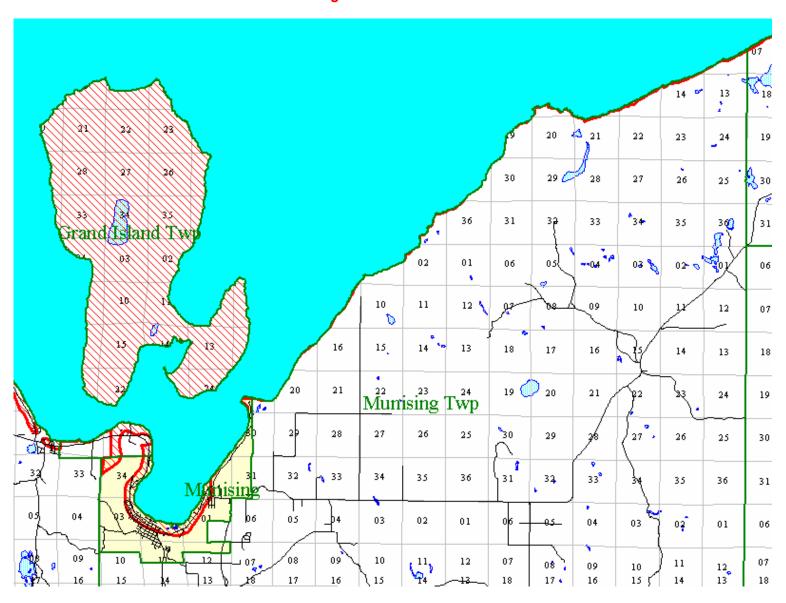
#### Alcona County Harrisville Township, T26N R9E Greenbush Township, T25N R9E



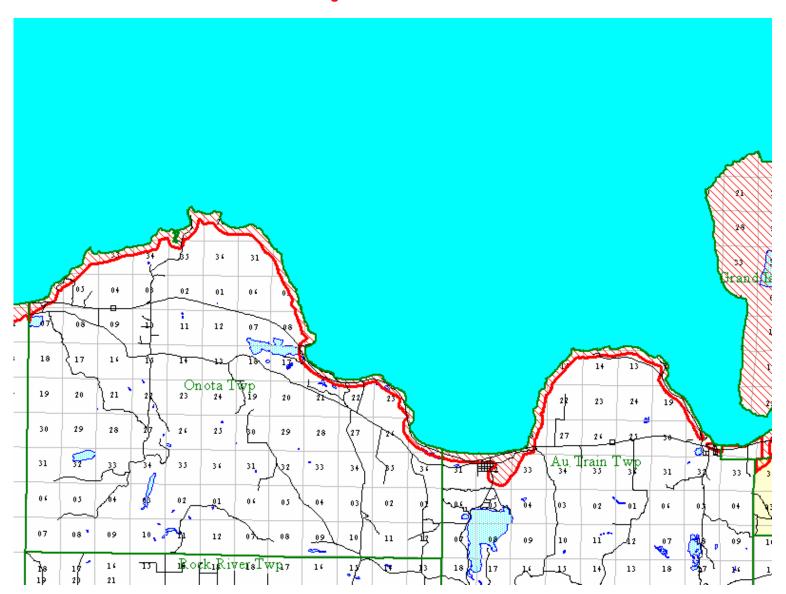
#### Alger County Burt Township, T48N R16W, T49N R13W, T49N R14W, T49N R15W, T49N R16W and T50 R13W



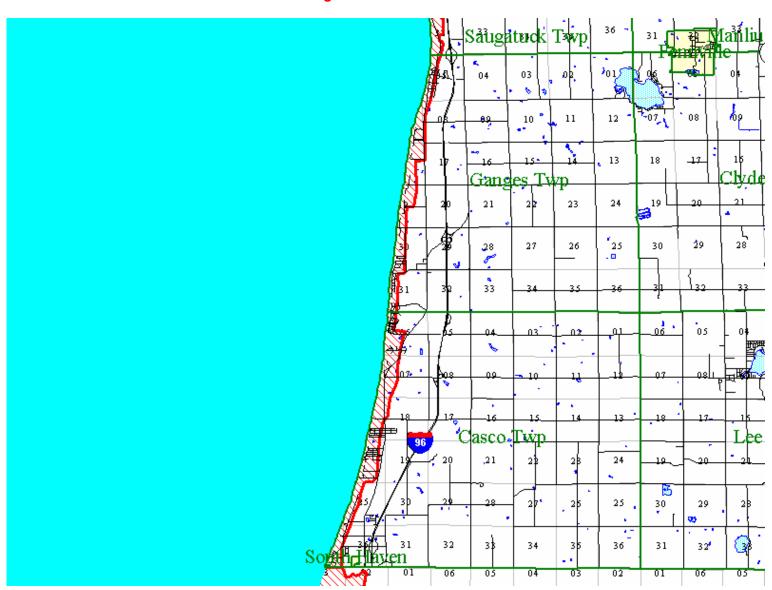
#### Alger County Grand Island Township, T47N R18W, T47N R19W, T48N R17W and T48N R19W Munising Township, T47N R18W, T47N R19W and T48N R18W Munising, T47N R18W, T47N R19W and T46N R19W



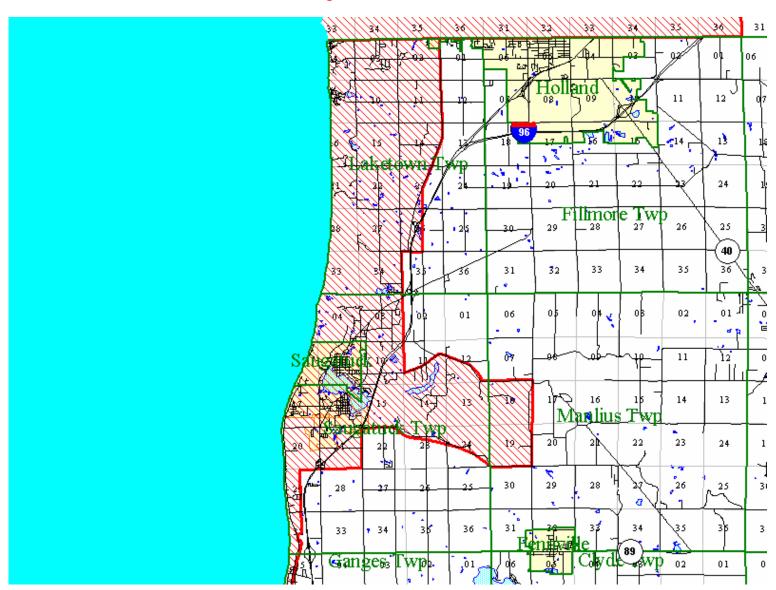
# Alger County Onota Township, T47N R21W, T47N R22W, T48N R21W and T48N R22W Au Train Township, T47N R20W and T47N R19W



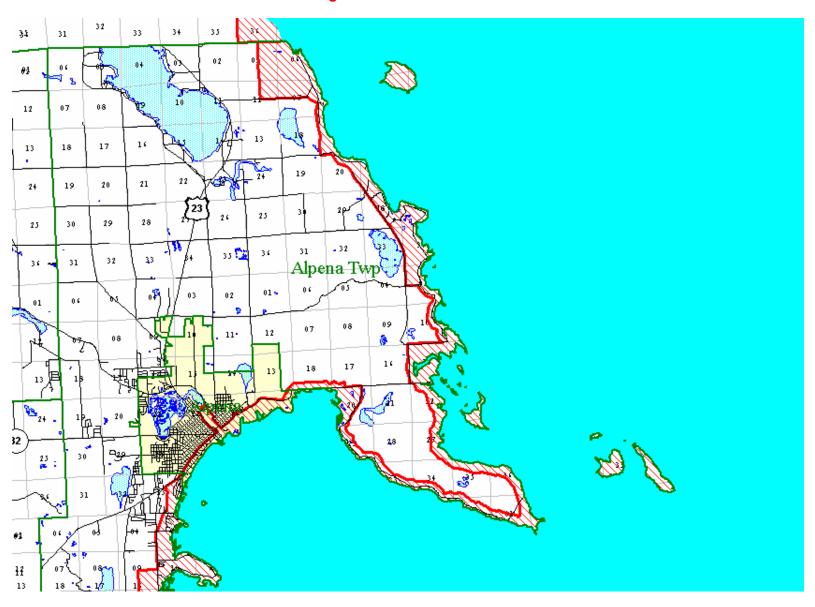
# Allegan County Ganges Township, T2N R16W Casco Township, T1N R16W and T1S R17W



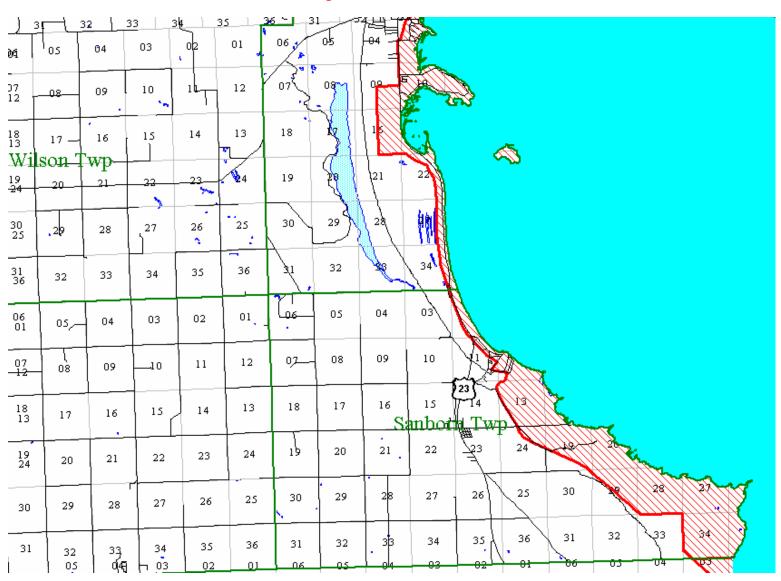
Allegan County
Laketown Township, T4N R16W
South Haven, T3N R 16W
Saugatuck Township, T3N R16W
Manlius Township T3N R15W



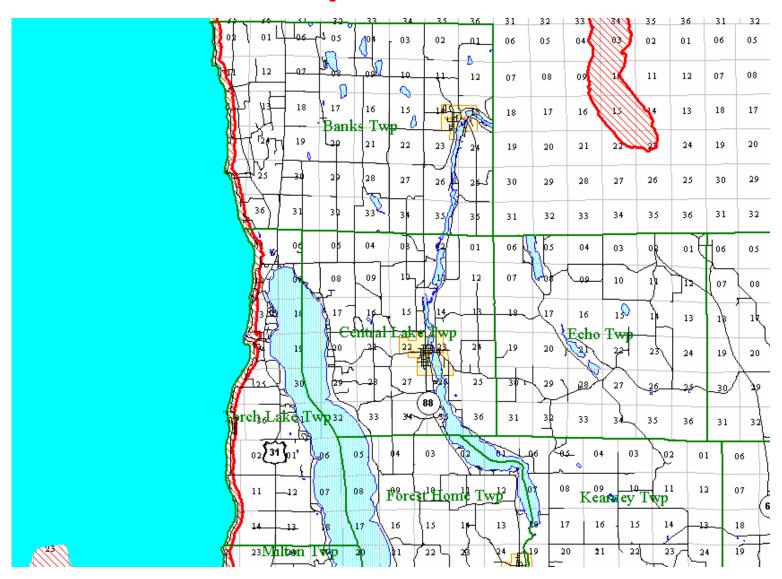
#### Alpena County Alpena Township, T32N R8E, T32N R9E, T31N R9E, T31N R10E, T31N R8E and T30N R9E City of Alpena, T31N R8E



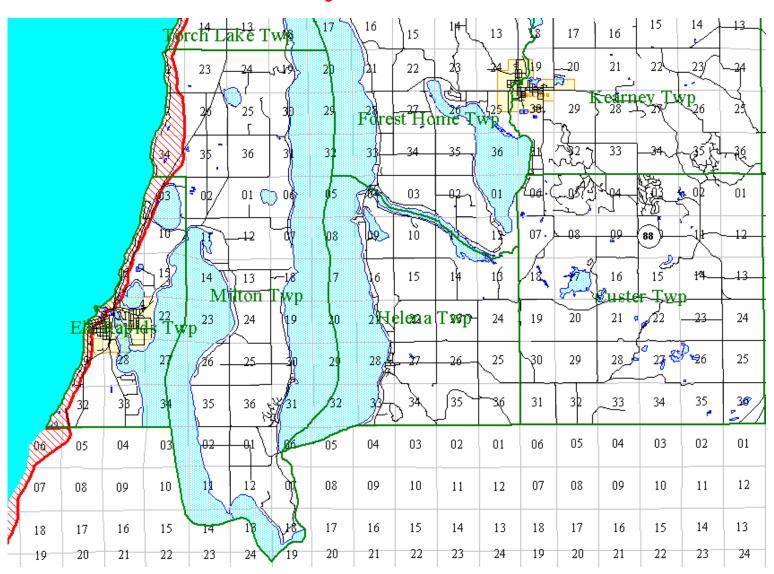
#### Alpena County Alpena Township, T30N R8E Sanborn Township, T29N R8E and T29 R9E



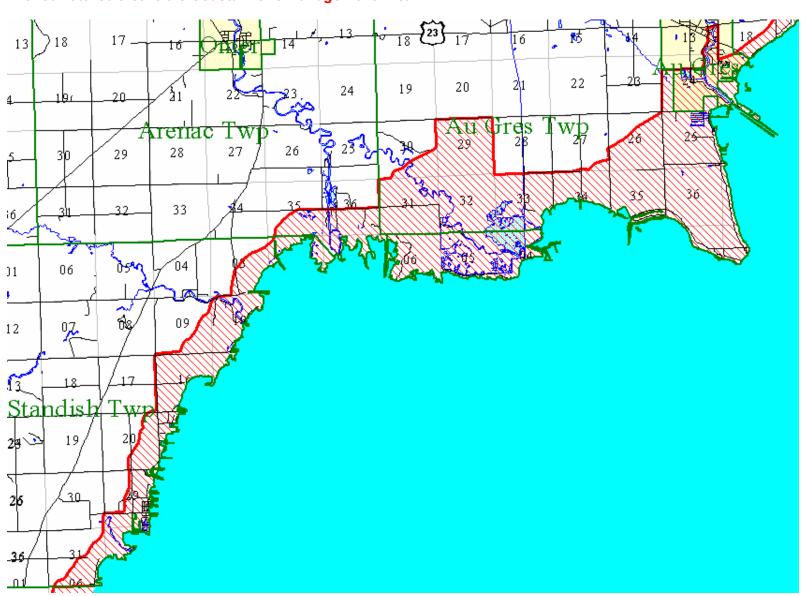
## Antrim County Banks Township, T33N R9W Torch Lake Township, T31N R9W and T30 R9W



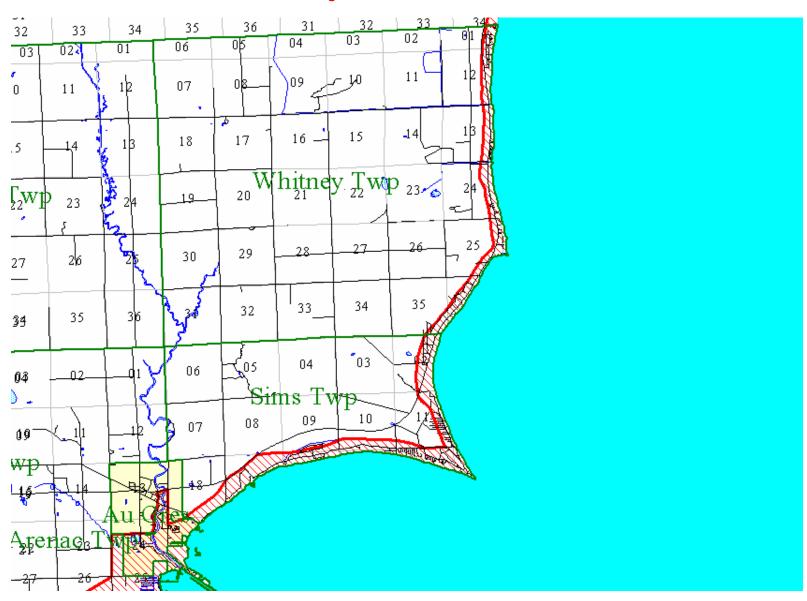
# Antrim County Milton Township, T30N R9W Elk Rapids Township, T29N R9W, and T30N R9W



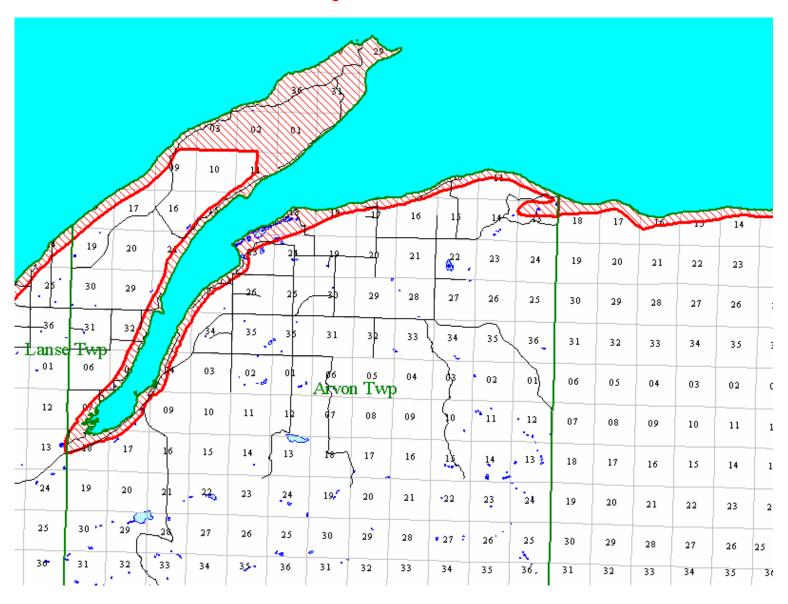
# Arenac County Standish Township, T18N R5E Arenac Township, T19N R5E, T18N R5E and T18N R6E Au Gres Township, T19N R6E, T18N R6E and T18N R7E



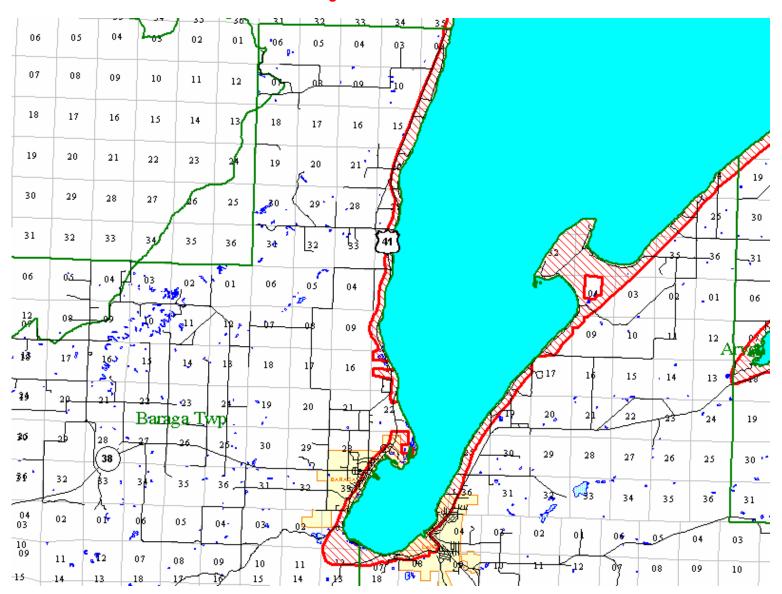
# Arenac County Whitney Township, T20N R7E and T20N R8E Sims Township, T19N R7E Au Gres Township, T19N R6E and T19N R7E



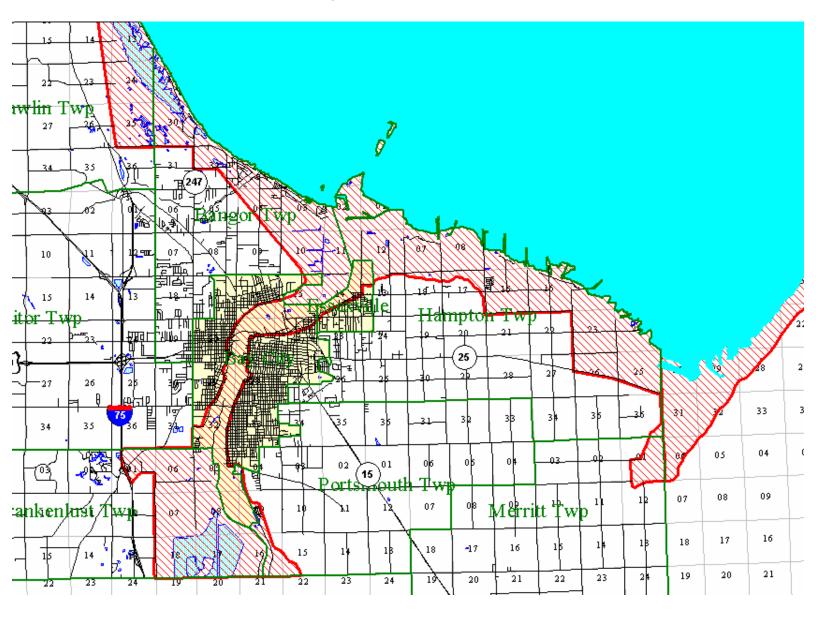
#### Baraga County Arvon Township, T51N R31W, T52 R30W, T52N R31W, T53N R30W and T53N R31W



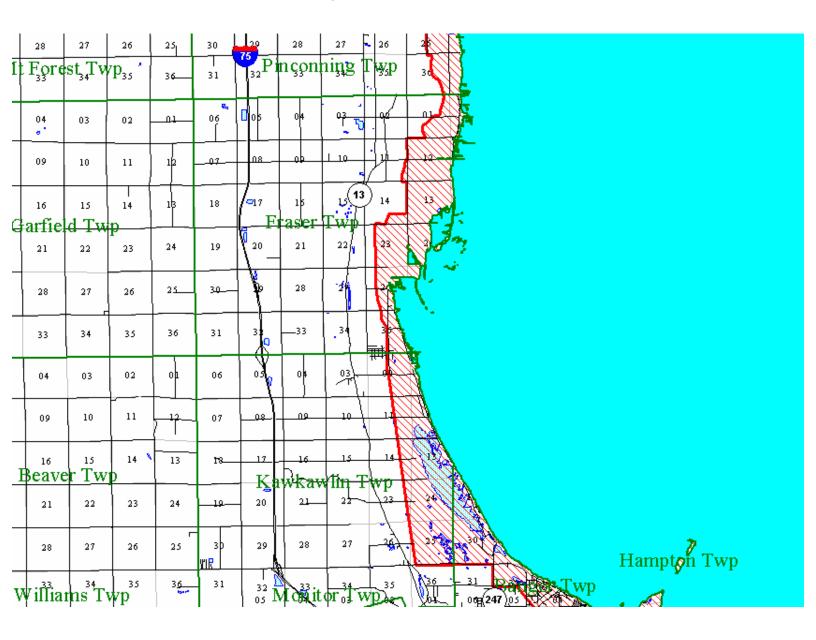
## Baraga County Baraga Township, T52N R33W, T51N R33W and T50 R34W L'Anse Township, T50N R33W, T51N R33W, T51N R32W and T52N R32W



Bay County
Bangor Township, T15N R5E and T14N R5E
Hampton Township, T14N R5E, T15N R5E and T14N R6E
Essexville, T14N R5E
Bay City, T14N R5E
Frankenlust Township, T13N R4E and T13N R5E
Merritt Township, T13N R6E
Portsmouth Township, T13N R5 E



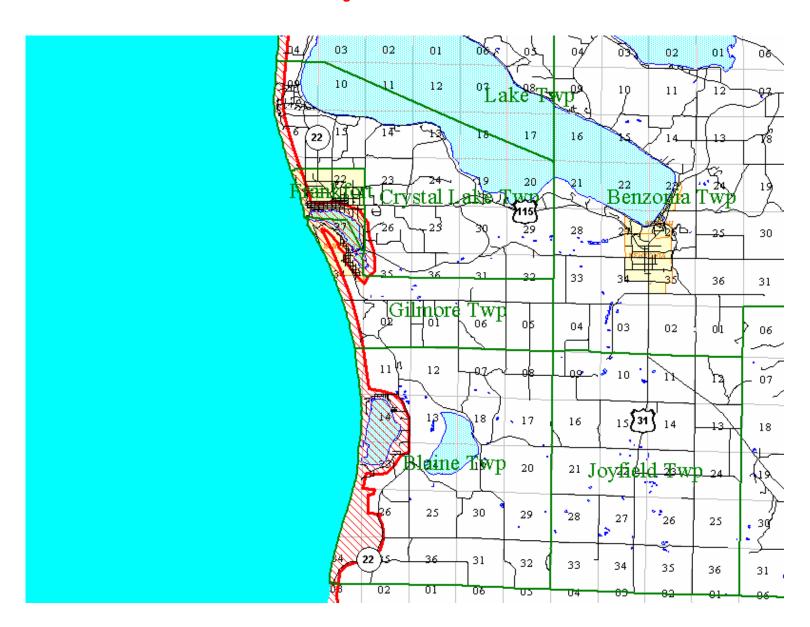
# Bay County Bangor Township, T15N R5E Kawkawlin Township, T15N R4 Fraser Township, T16N R4E and T16N R5E



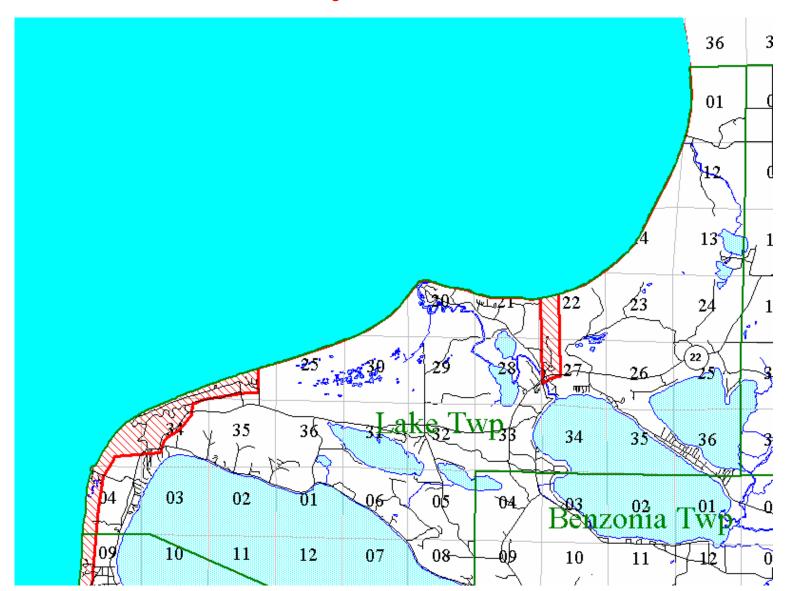
## **Bay County Pinconning Township, T17N R4E and T17N R5E**

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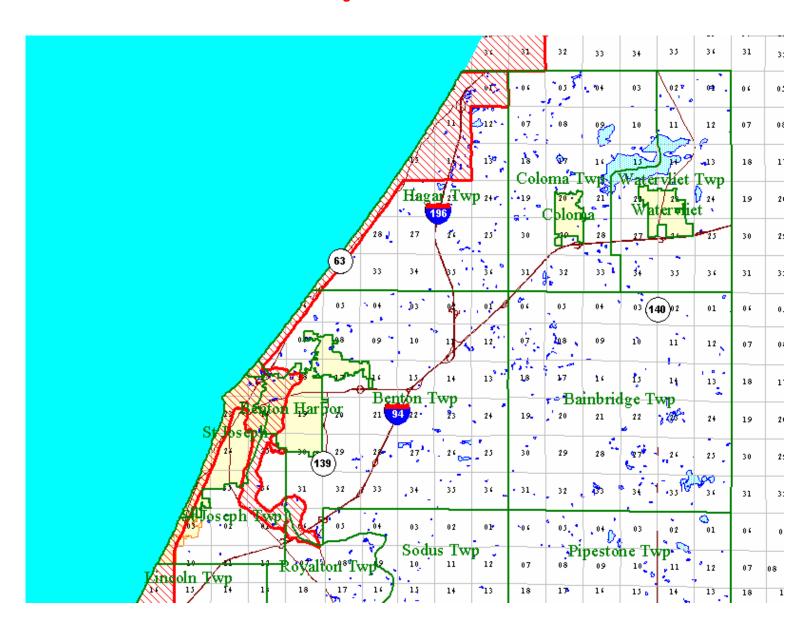
Benzie County Crystal Lake Township, T26N R16W Frankfort, T26N R16W Gilmore Township, T26N R16W Blaine Township, T25N R16W



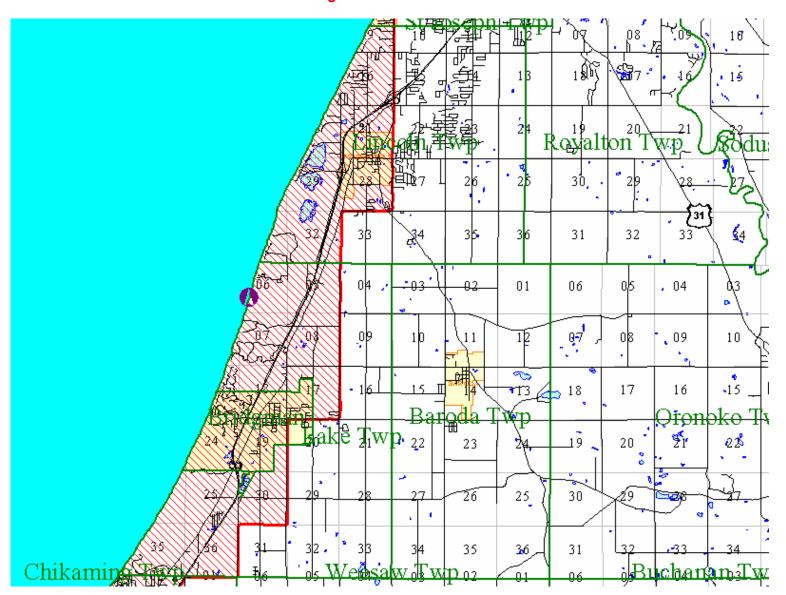
## Benzie County Lake Township, T27N R15W and T27N R16W



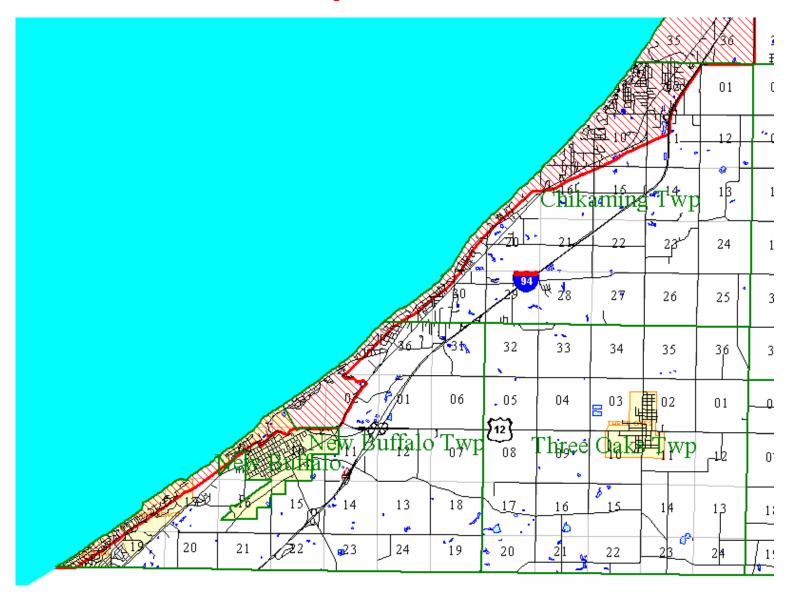
Berrien County
Hagar Township, T3S R18W
Benton Township, T4S R18W, T4S R19W and T5S R18W
St. Joseph Township, T4S R19W, T5S R18W and T5S R19W
Benton Harbor, T4S R19W and T4S R18W
St. Joseph, T4S R19W



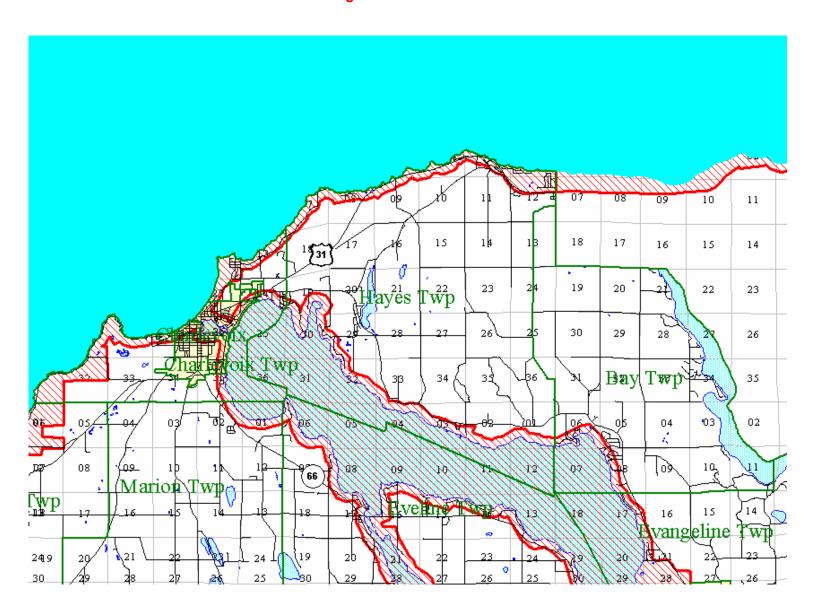
Berrien County Lincoln Township, T5S R19W Lake Township, T6S R19W and T6S R20W Bridgman, T6S R19W and T6S R20W



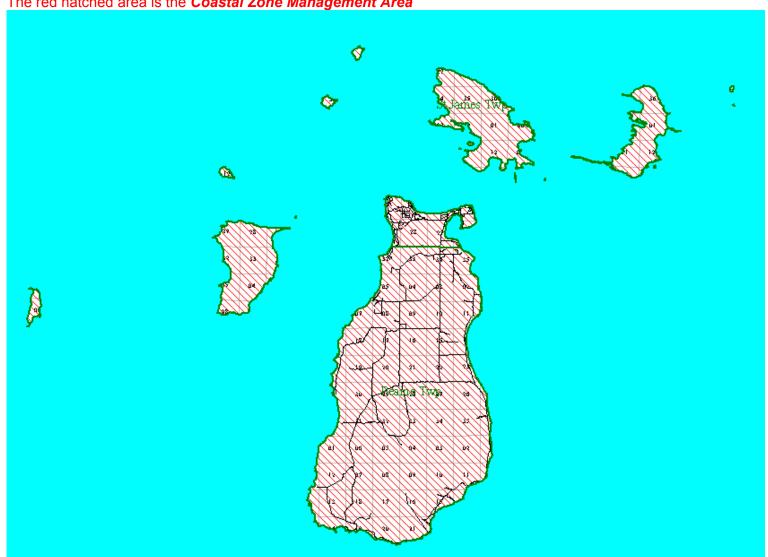
Berrien County
New Buffalo, T8S R21W
New Buffalo, Township, T7S R21W, T8S R21W and T8S R22W
ChickamingTownship, T7S R20W, and T7S R21W



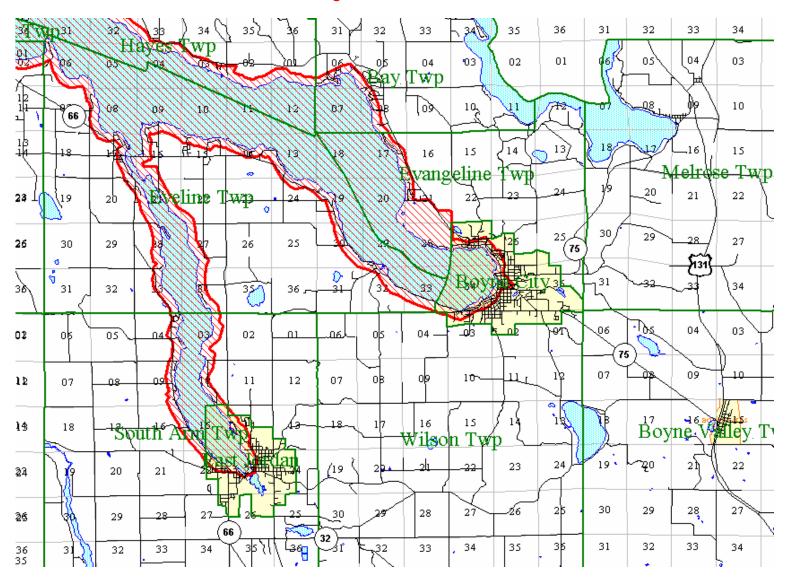
Charlevoix County
Bay Township, T33N R6W
Charlevoix Township, T34N R8W
Hayes Township, T34N R7W, T34N R8W, and T33 R7W



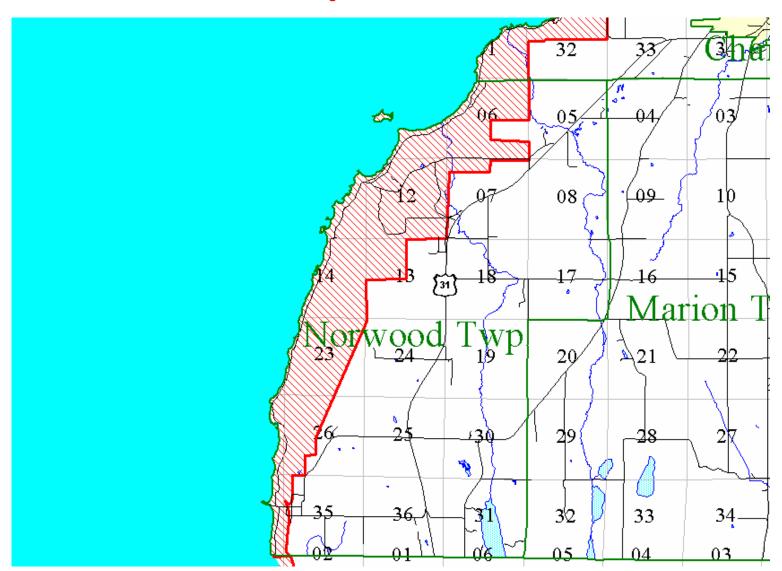
# Charlevoix County Beaver Island Group, T37N R10W, T37N R11W, T38N R10W, T38N R11W, T38N R12W, T39N R9W, T39N R10W, T39N R11W, T40N R8W, T40N R9W, T40N R10W and T40N R11W



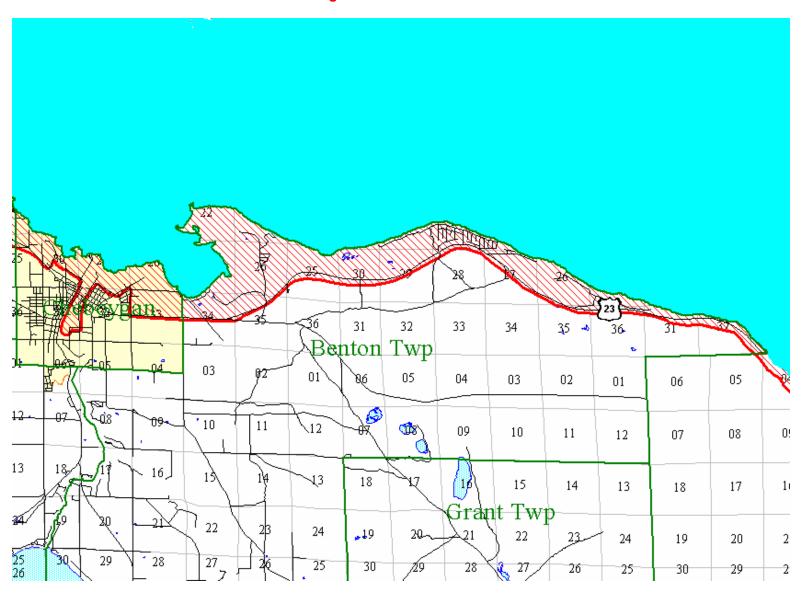
Charlevoix County
Eveline Township, T33N R7W and T33 R9W
South Arm Township, T32N R7W
East Jordan, T32N R7W
Evangeline Township, T33N R6W
Wilson Township, T32N R6W
Boyne City, T33N R6W and T32N R6W



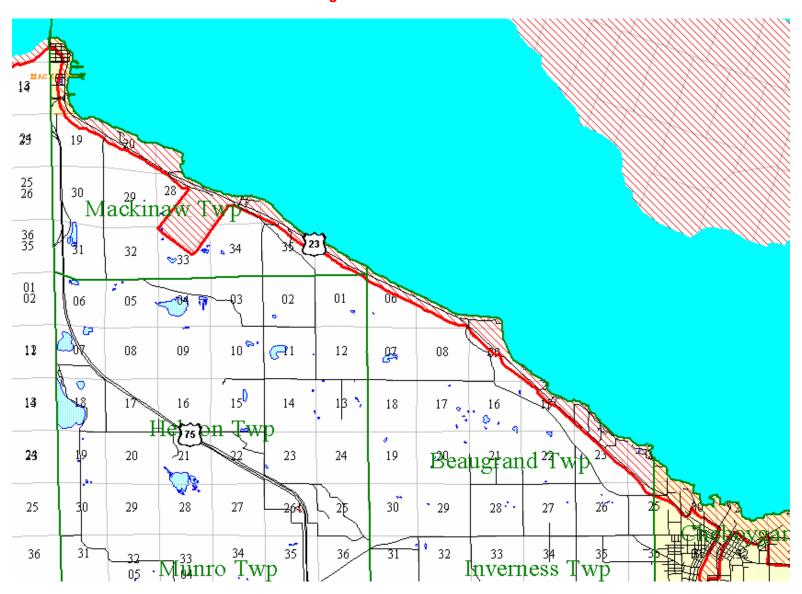
## **Charlevoix County Norwood Township, T33N R8W and T33 R9W**



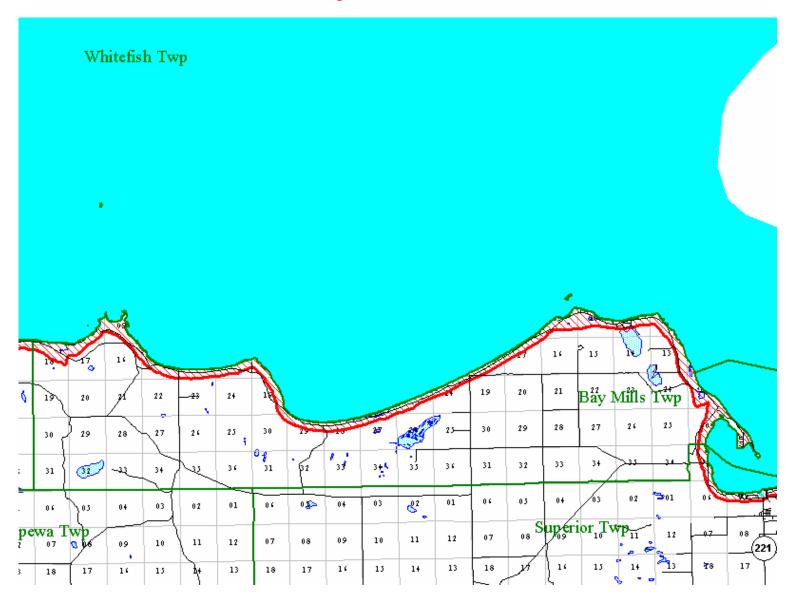
### Cheboygan County Benton Township, T38N R2E, T38 R1E and T38 R1W City of Cheboygan, T38 R1W T38N R2W



Cheboygan County Mackinaw Township, T39N R3W Hebron Township, T38 R3W Beaugrand Township, T38 R2W

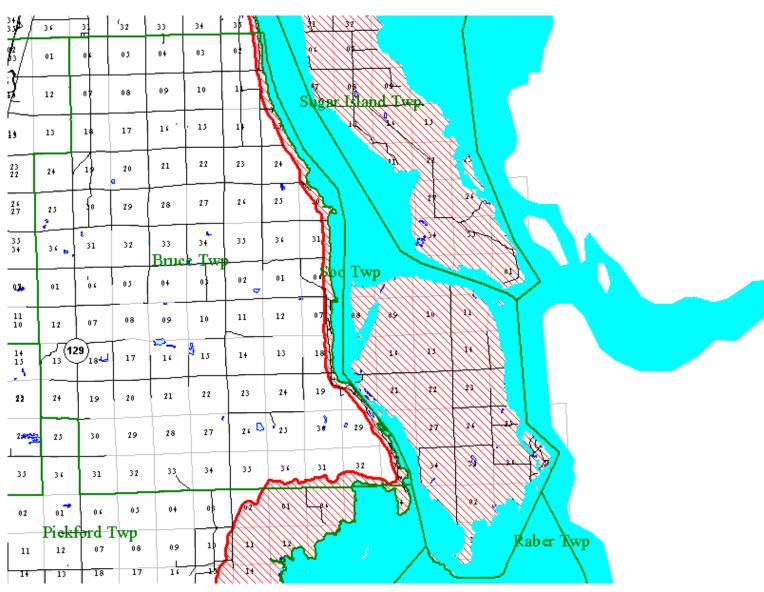


## Chippewa County Bay Mills Township, T47N R2W, T47N R3W, T47N R4W and T47N R5W

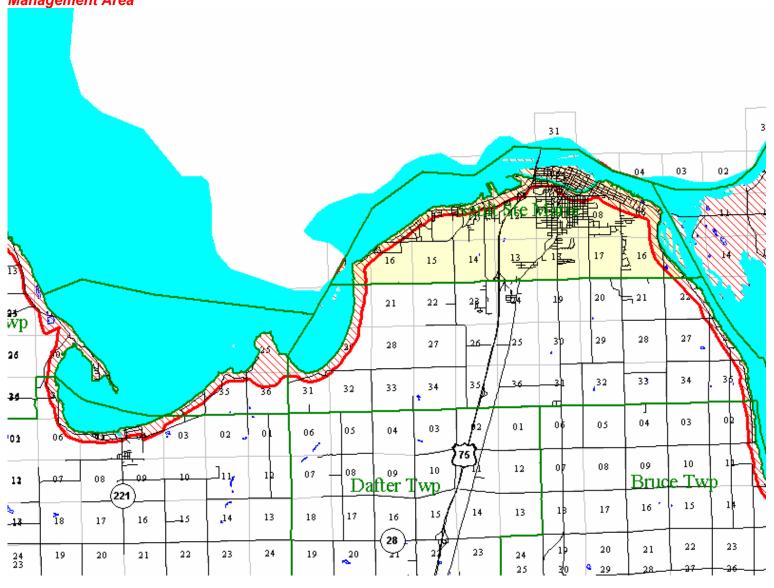


## **Chippewa County**

## Soo Township, Nebbish Island, T44N R2E, T45N R2E and T45N R3E Bruce Township, T45N R1E, T45N R2E, T46N R1E and T46N R2E

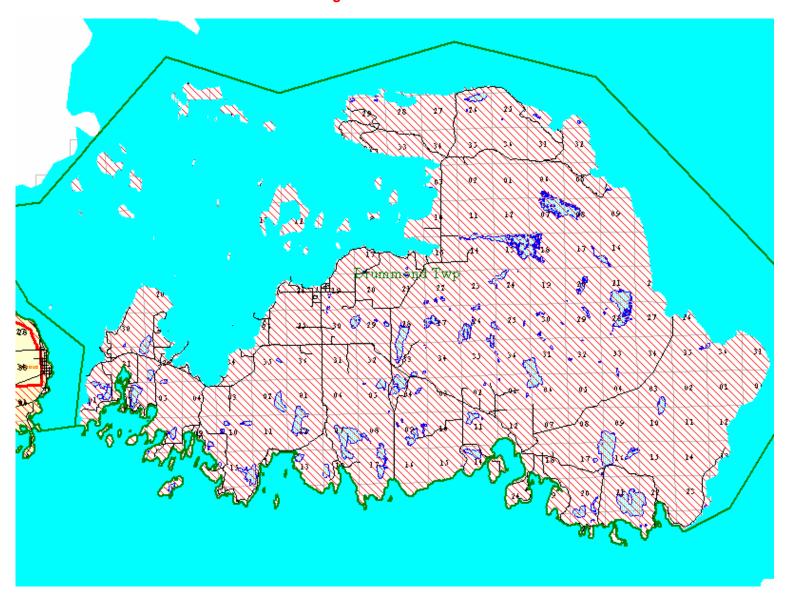


Chippewa County
Bay Mills Township, T47N R2W
Superior Township, T47N R2W and T46N R2W
Soo Township, T47N R1W and T47N R1E
Sault Ste. Marie, T47N R1W and T47N R1E

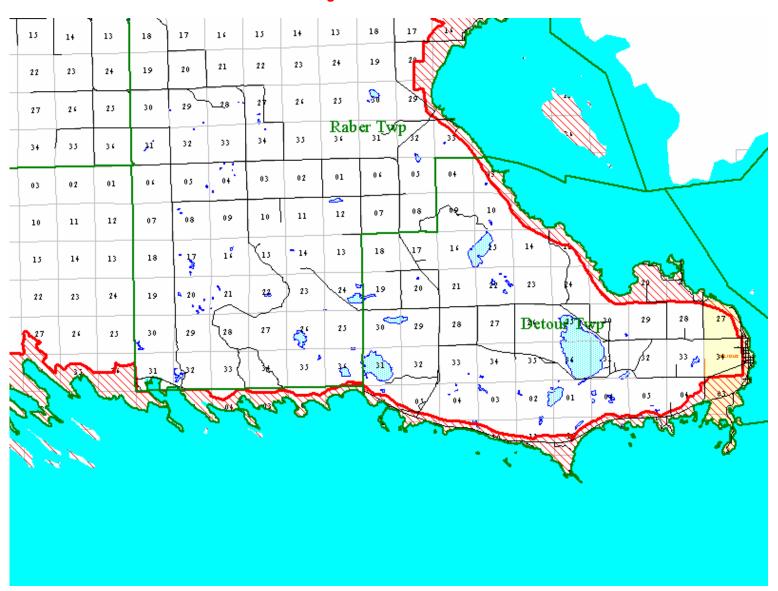


## **Chippewa County**

Drummond Township, T41N R4E, T41N R5E, T41N R6E, T41N R7E, T41N R8E, T42N R4E, T42N R5E, T42N R6E, T42N R7E, T42N R8E, T43N R4E, T43N R5E, T43N R6E and T43N R7E



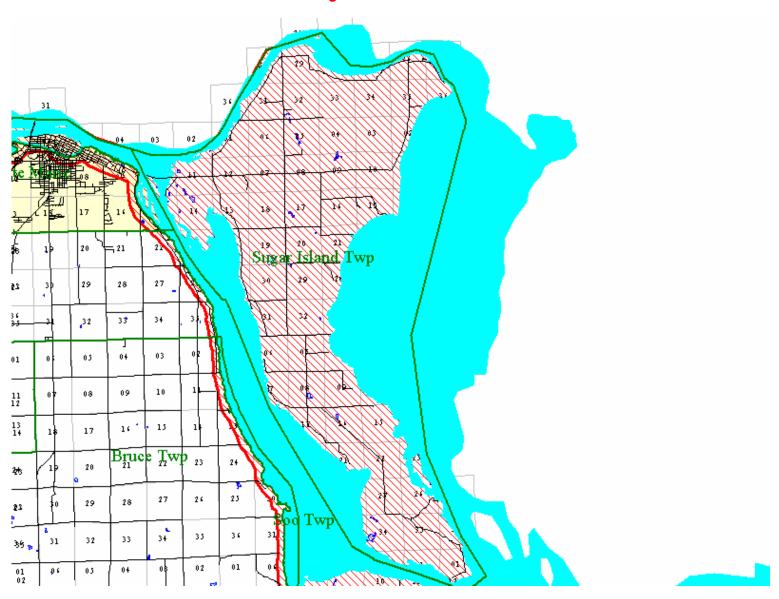
## Chippewa County Detour Township, T41N R3E, T41N R4E, T42N R31E and T42N R4E Raber Township, T42N R2E and T43N R4E



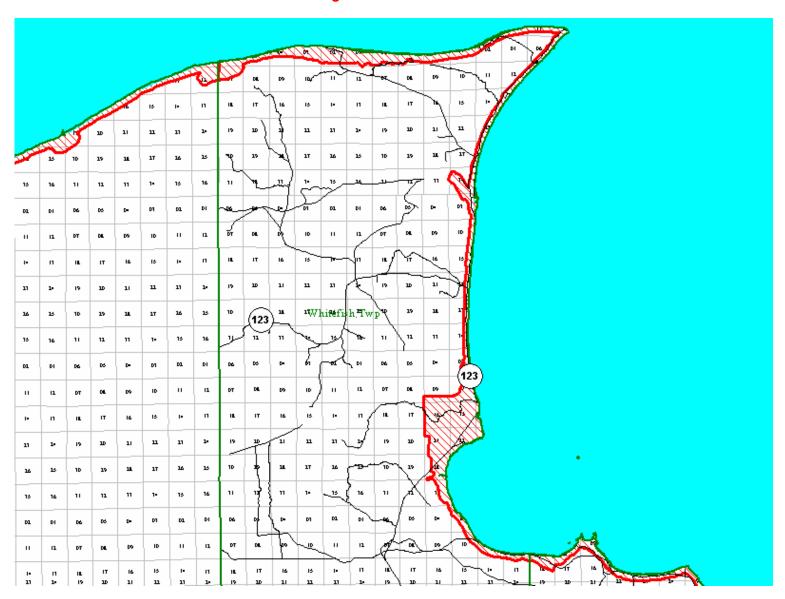
## Chippewa County Pickford Township, T44N R1E and T44N R2E Raber Township, T43N R3E, T43N R2E and T44N R2E

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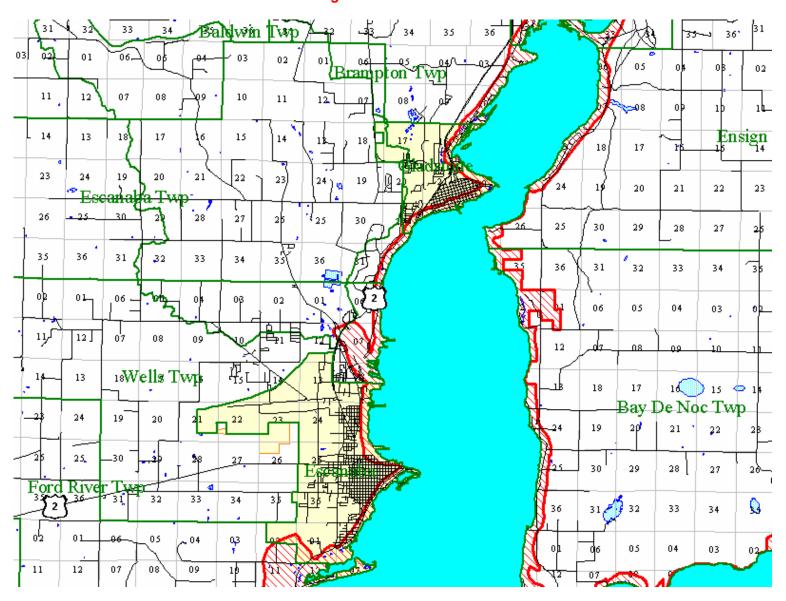
#### Chippewa County Sugar Island Township, T45N R2E, T46N R2E, T47N R2E, T47N R1E, T48N R1E and T48N



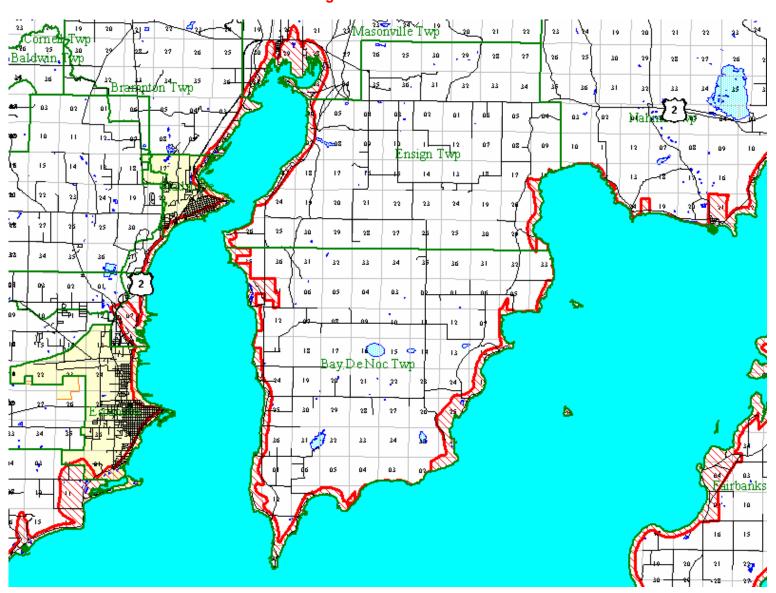
### Chippewa County Whitefish Township, T47N R6W, T48N R6W, T49N R6W, T50N R5W, T50N R6W, T50N R7W, T51N R5W, and T51N R6W



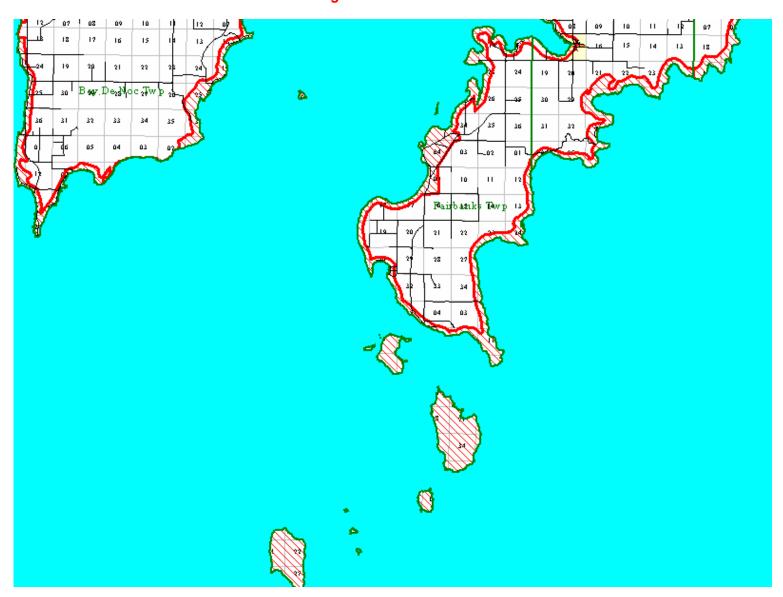
Delta County
Brampton Township, T40N R22W
Gladstone, T40N R22W
Escanaba Township, T40N R22W
Wells Township, T39N R22W and T39N R23W
Escanaba City, T38N R22W, T38N R23W and T39N R22W



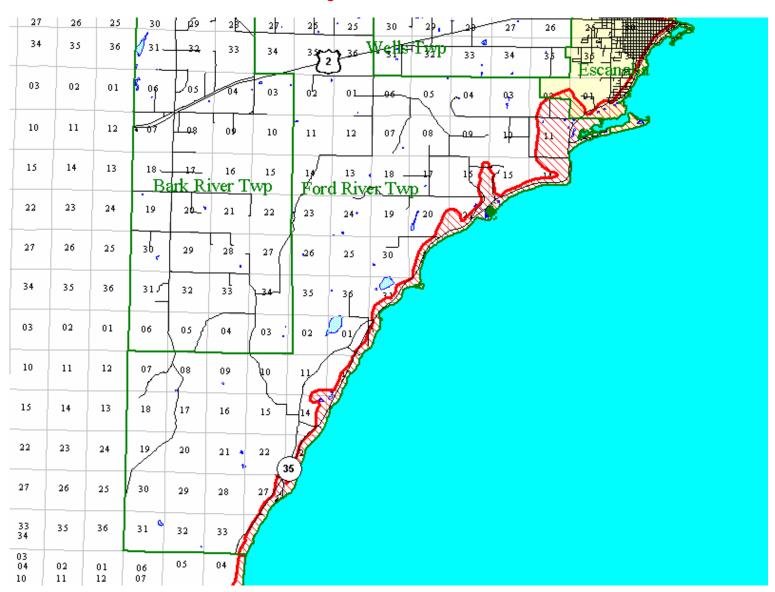
Delta County
Ensign Township, T40N R20W, T40N R21W and T40N R22W
Bay De Noc Township, T38N R21W, T38N R22W, T39N R20W, T39N R21W,
T39N R22W, T40N R20W and T40N R22W
Masonville Township, T41N R21W



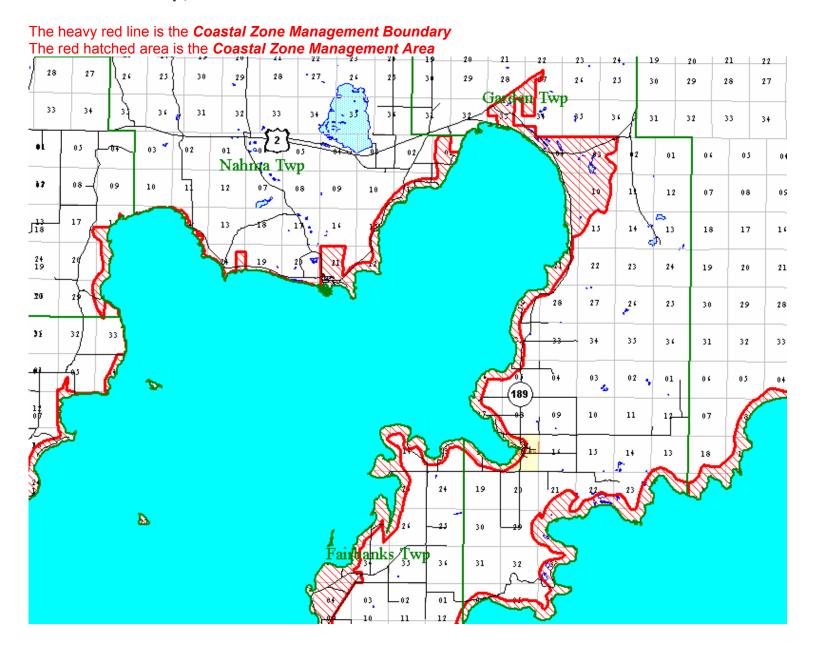
## Delta County Fairbanks Township, T36N R19W, T36N R20W, T37N R19W, T37N R20W, T38N R20W, and T39N R19W



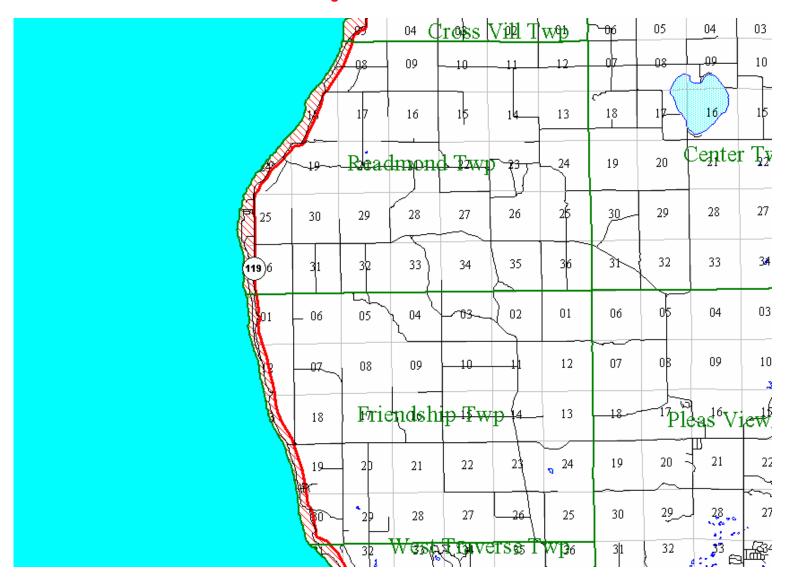
### Delta County Ford River Township, T37N R23W, T37N R24W and T38N R23W



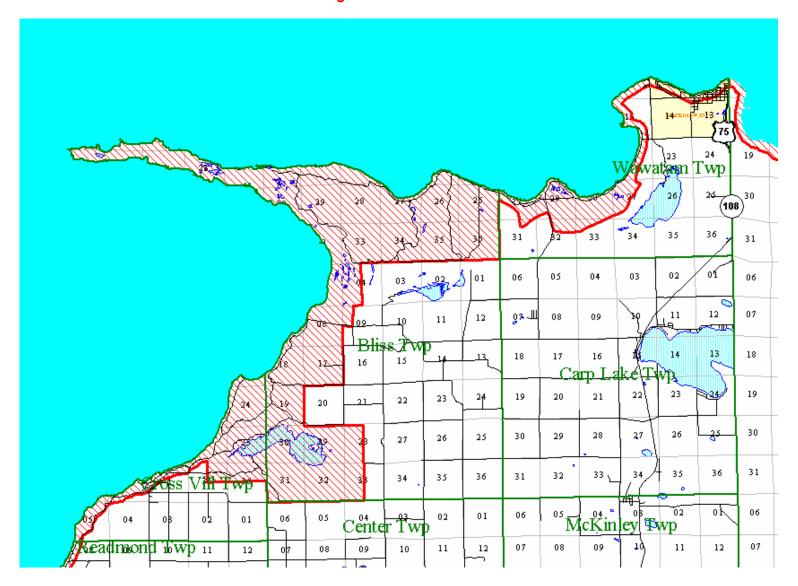
Delta County Garden Township, T38N R18W, T39N R18W, T40N R18W and T41N R18W Nahma Township, T40N R19W and T40N R20W



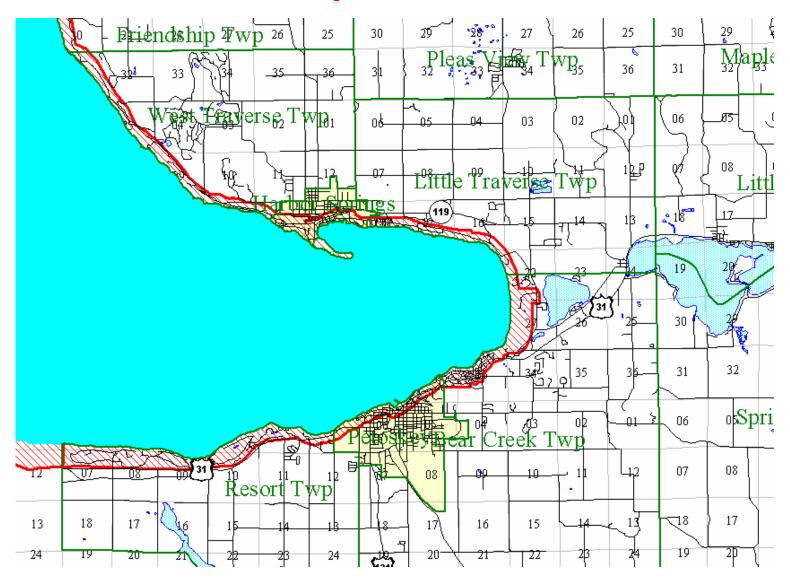
## Emmet County Readmond Township, T37N R6W and T37 R7W Friendship Township, T37N R7W and T37 R6W



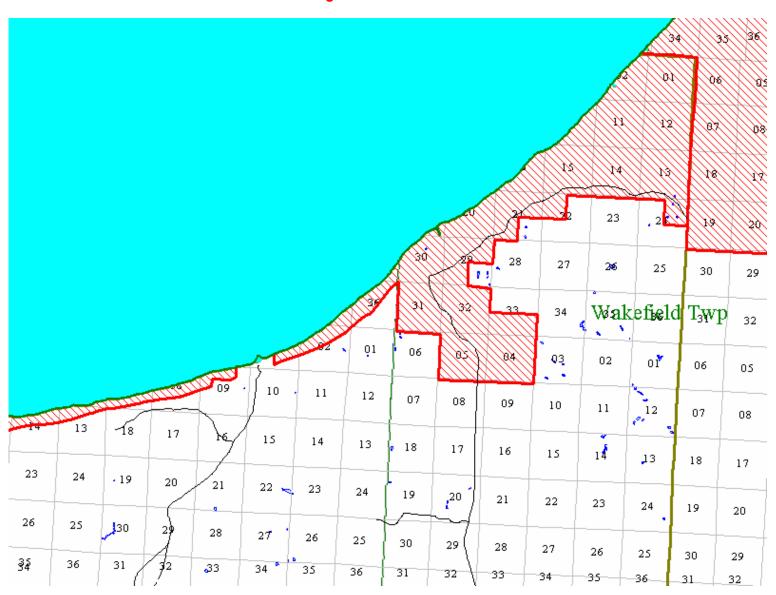
Emmet County Wawatam Township, T39N R4W Bliss Township, T39N R5W, T38 R5W and T39 R6W Cross Village Township, T38 R6W



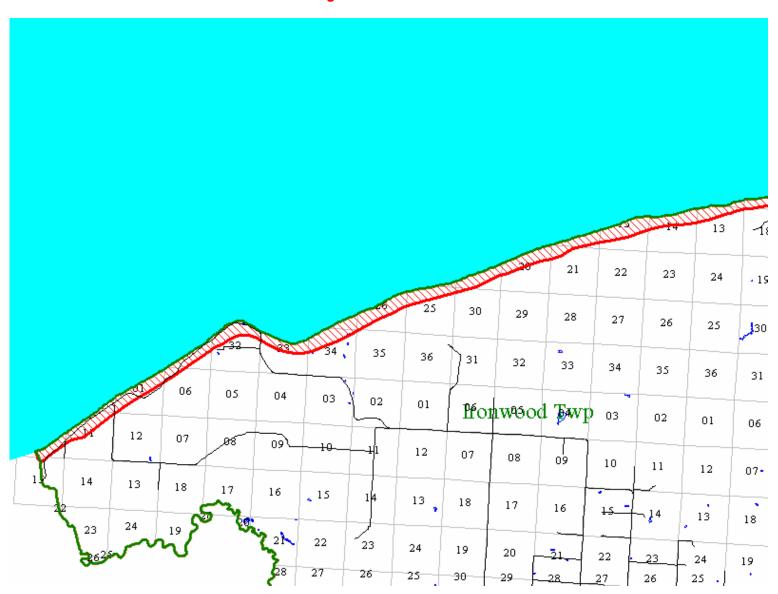
Emmet County
West Traverse Township, T36N R6W and T35 R6W
Harbor Springs, T35N R6W
Little Traverse Township, T35N R5W
Bear Creek Township, T35N R5W
Petoskey, T35N R5W and T34 R5W
Resort Township, T34N R6W



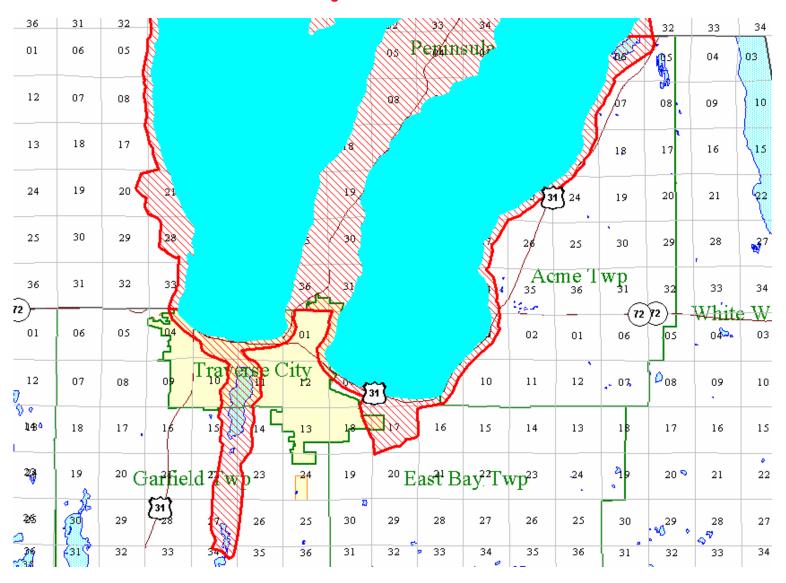
# Gogebic County East Part of Ironwood Township, T49N R47W, T49N R46W and T50N R46W Wakefield Township, T49N R45W and T50N R45W



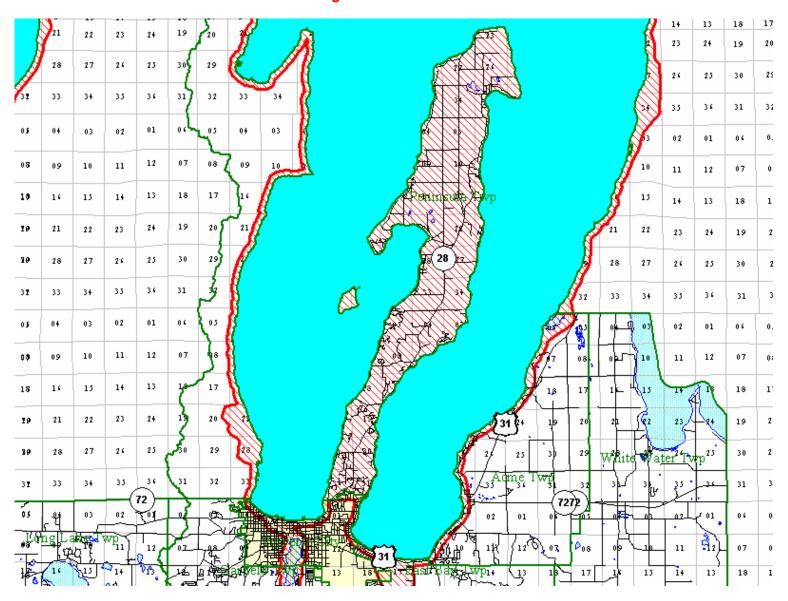
## Gogebic County West Part of Ironwood Township, T48N R48W, T48N R49W, T49N R47W and T49N R48W



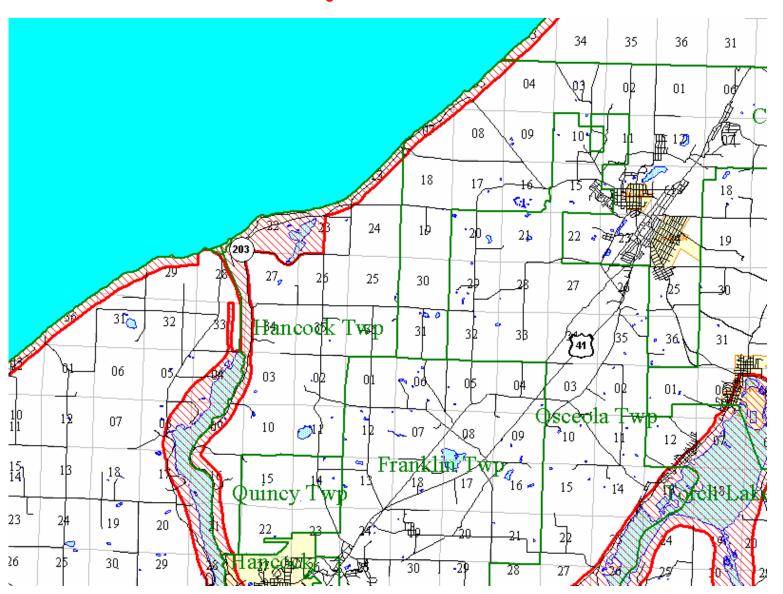
Grand Traverse County
Acme Township, T28N R9W, T28N R10W, and T27N R10W
East Bay Township, T27N R10W
Garfield Township, T27N R10W and T27N R11W
Traverse City, T27N R10W and T27N R11W



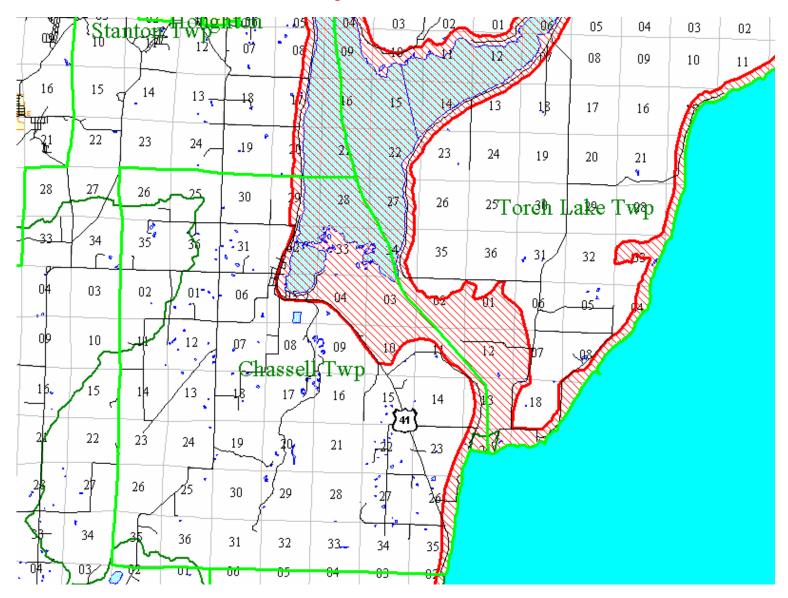
## Grand Traverse County Peninsula Township, T28N R10W, T28N R11W, T29N R10W and T30N R10W



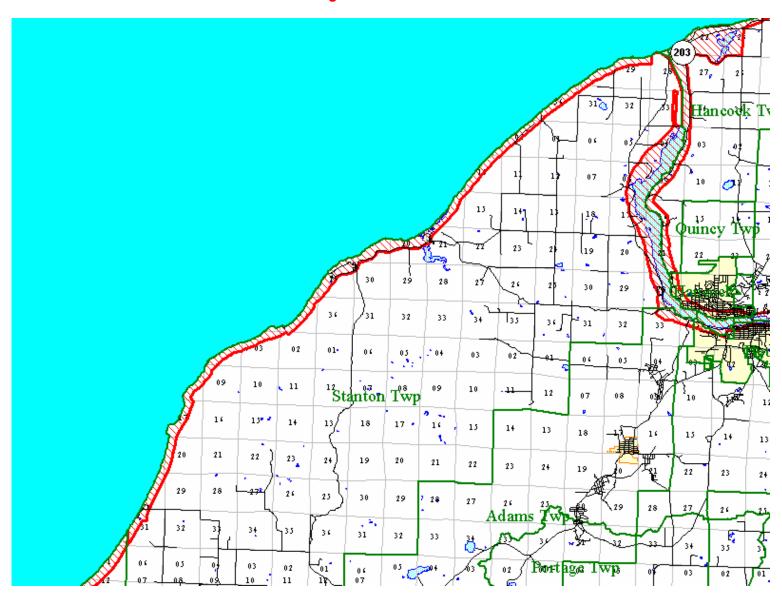
### Houghton County Hancock Township, T56N R34W and T55N R35W Calumet Township, T56N R33W



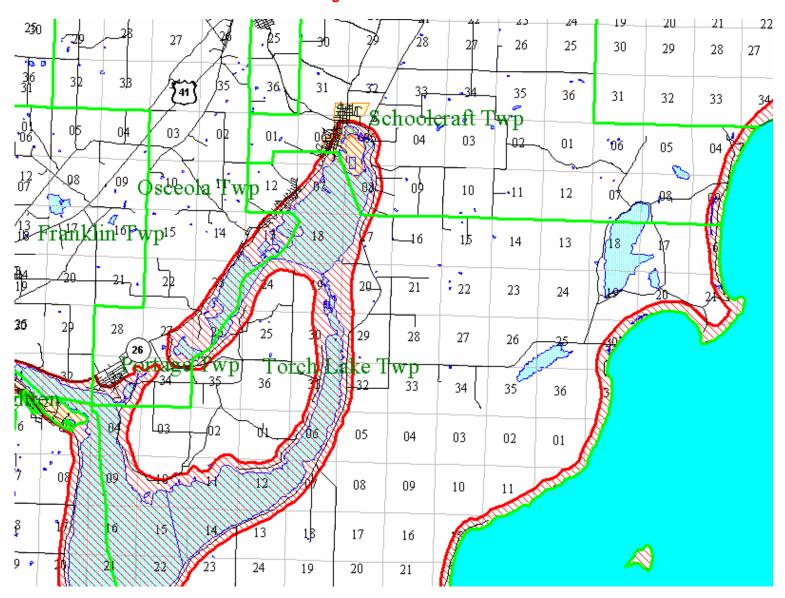
Houghton County Chassell Township, T54N R33W Portage Township, T54N R33W South part of Torch Lake Township, T54N R32W, T53N R32W, T55N R33W and T54N R33W



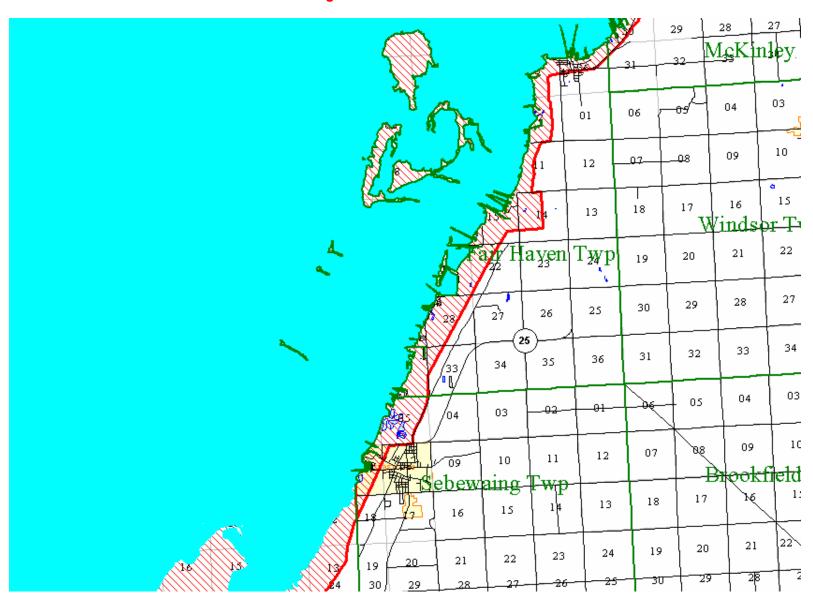
#### Houghton County Stanton Township, T54N R36W, T55N R34W, T55N R35W, T55N R36W, T56N R34W and T56N R35W



Houghton County Schoolcraft Township, T55N R31W, T55N R32W and T55N R33W Osceola Township, T55N R33W Franklin Township, T55N R33W Portage Township, T55N R33W and T54N R33W North part of Torch Lake Township, T55N R32W, T55N R33W, T54N R32W and T54N R33W



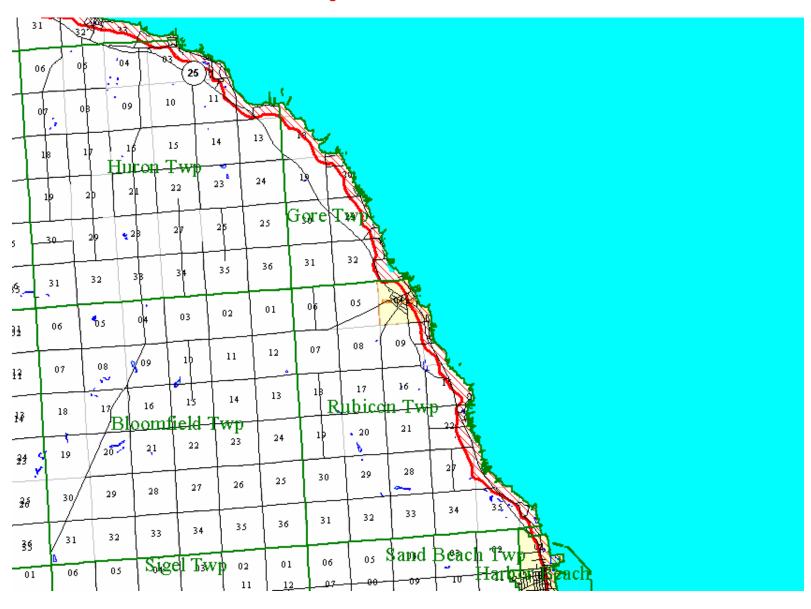
# Huron County Fair Haven Township T17N R9E and T16N R9E Sebewaing Township, T15N R9E



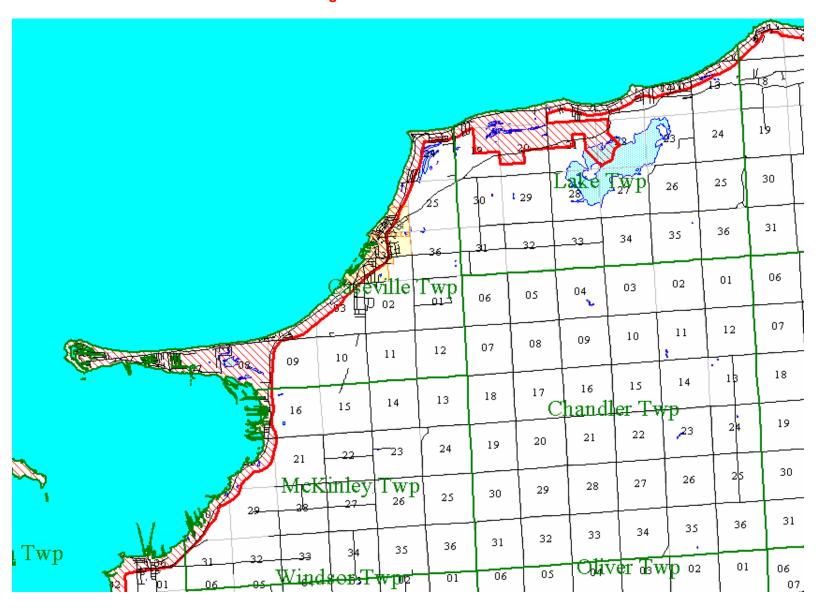
## Huron County Harbor Beach, T16N R16E and T16N R15E Sand Beach Township T16N R16E Sherman Township, T15N R16E

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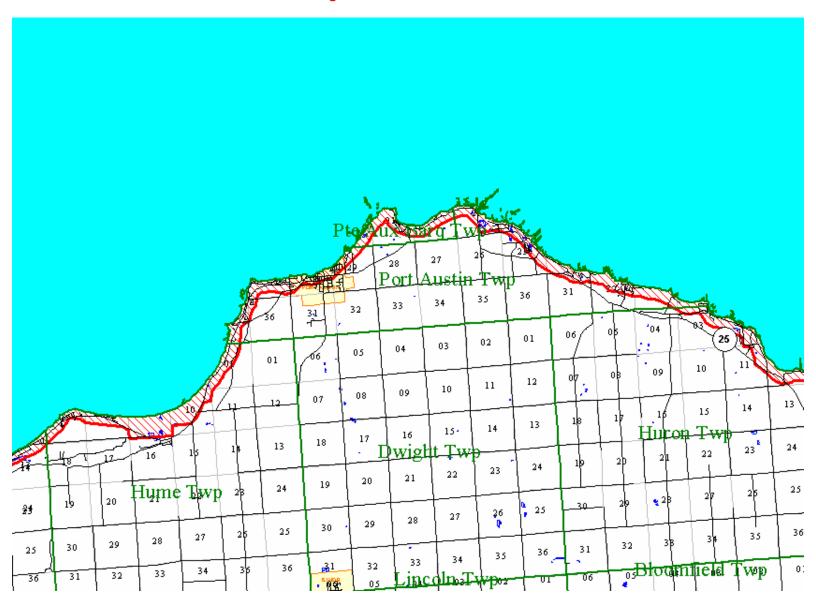
## Huron County Huron Township, T18N R14E Gore Township T18N R15E Rubicon Township, T17N R15E



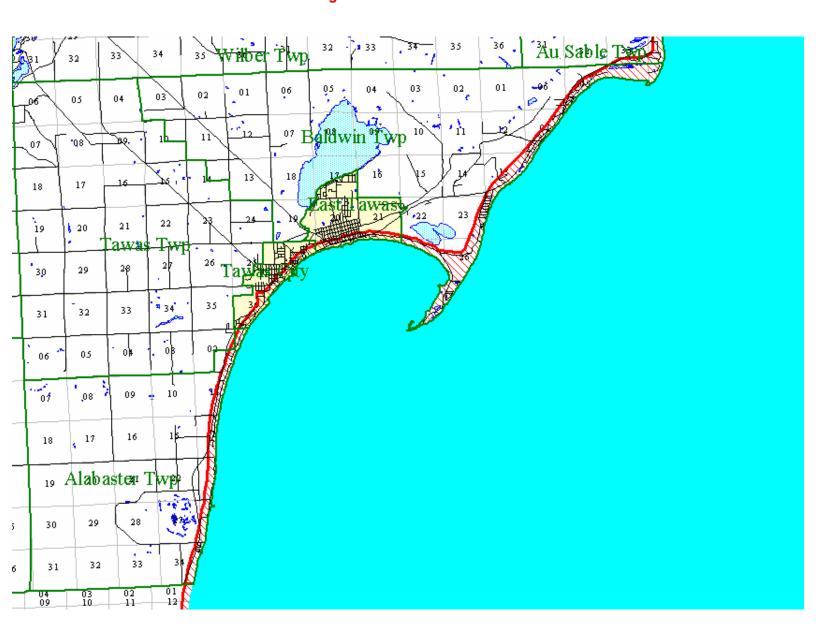
# Huron County Lake Township, T18N R11E Caseville Township T18N R10E, T17N R10E and T17N R9E McKinley Township, T17N R10E



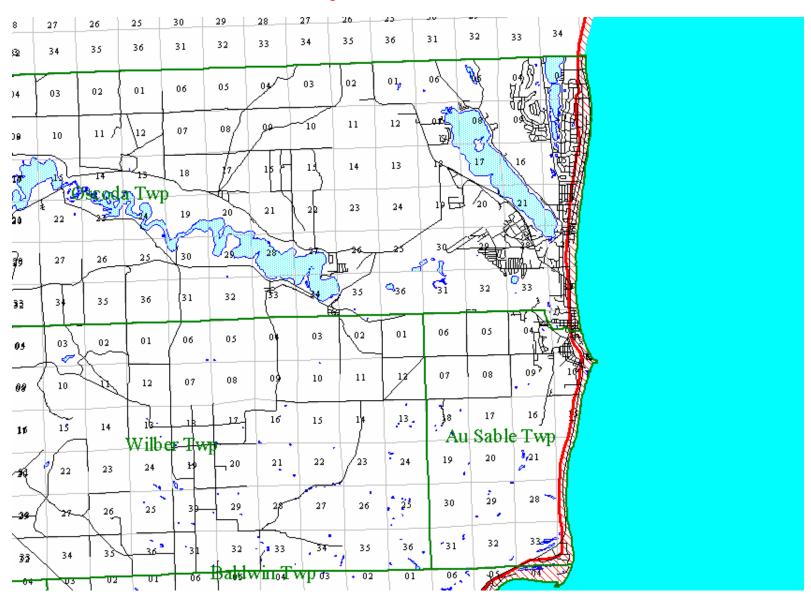
# Huron County Pte. Aux Barques Township, T19N R13E Port Austin Township T19N R12E, T19N R13E and T19N R14E Hume Township, T18N R12E



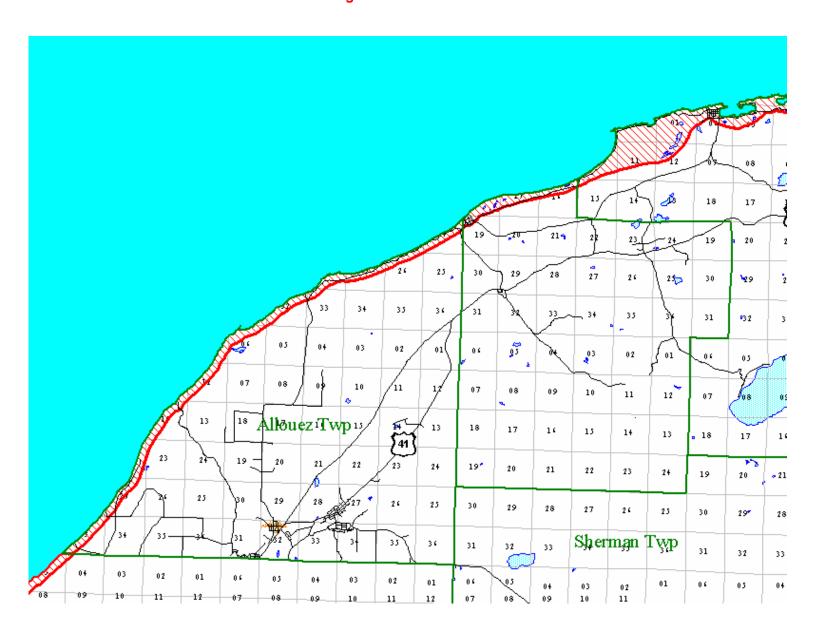
Iosco County
Baldwin Township, T22N R9E and T22N R8E
East Tawas, T22N R8E
Tawas Township, T22N R8E and T22N R7E
Tawas City, T22N R8E and T22N R7E
Alabaster Township, T21N R7E



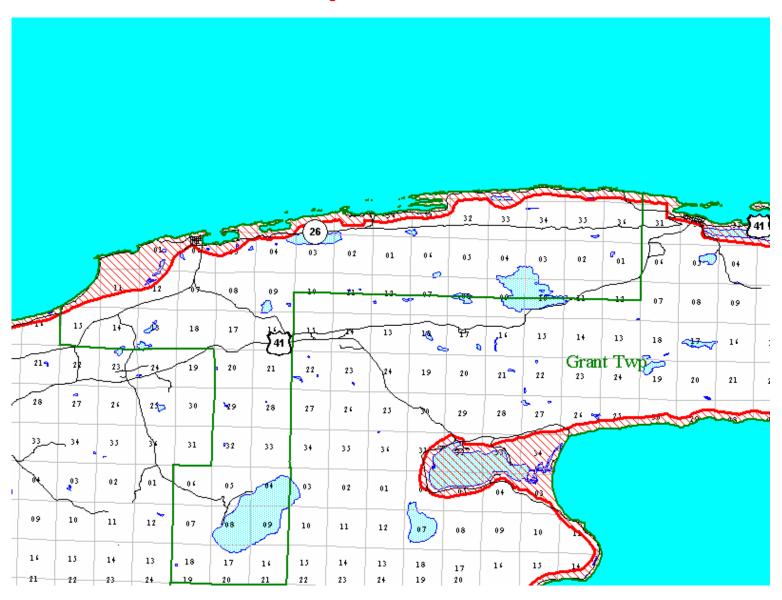
## Iosco County Oscoda Township, T24N R9E Au Sable Township, T23N R9E



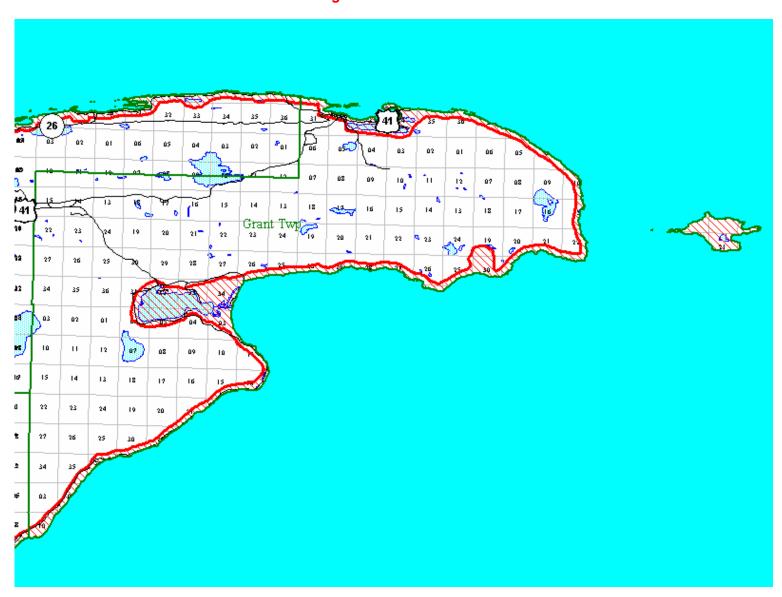
## Keweenaw County -- Mainland Allouez Township, T57N R33W, T57N R32W and T58N R32W, Houghton Township, T58N R31W



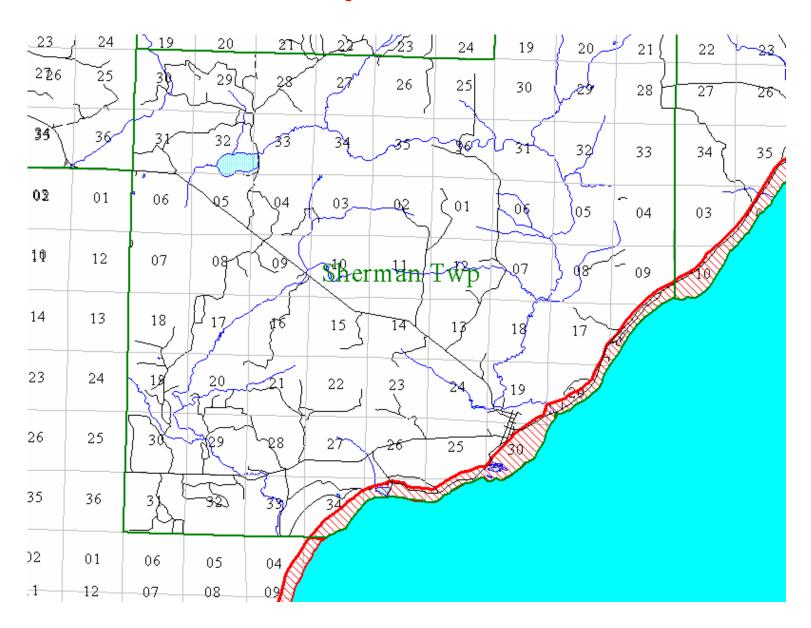
## Keweenaw County -- Mainland Eagle Harbor Township, T58 R31W, T58N R30W, T59N R29W, and T59 R30W



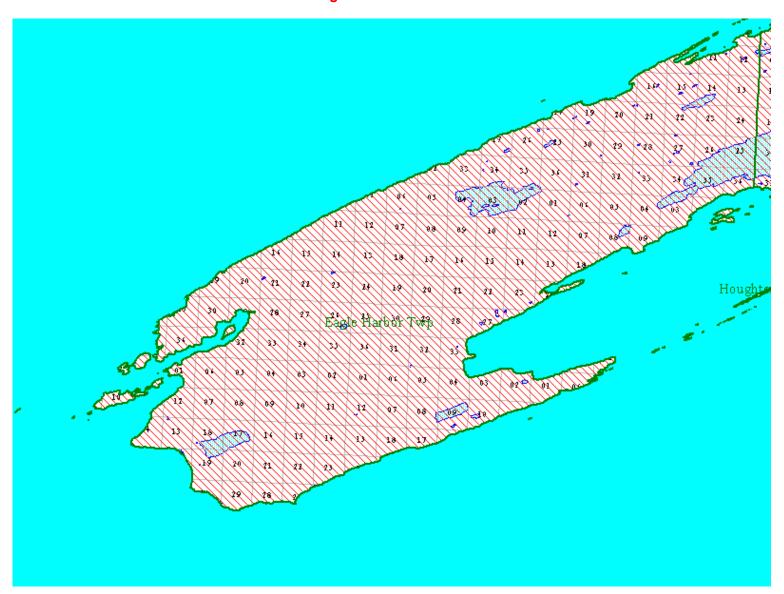
### Keweenaw County -- Mainland Grant Township, T56N R30W, T57 R29W, T57N R30W, T58 R26W, T58N R27W, T58N R28W, T58N R29W, T59N R27W and T59 R28W



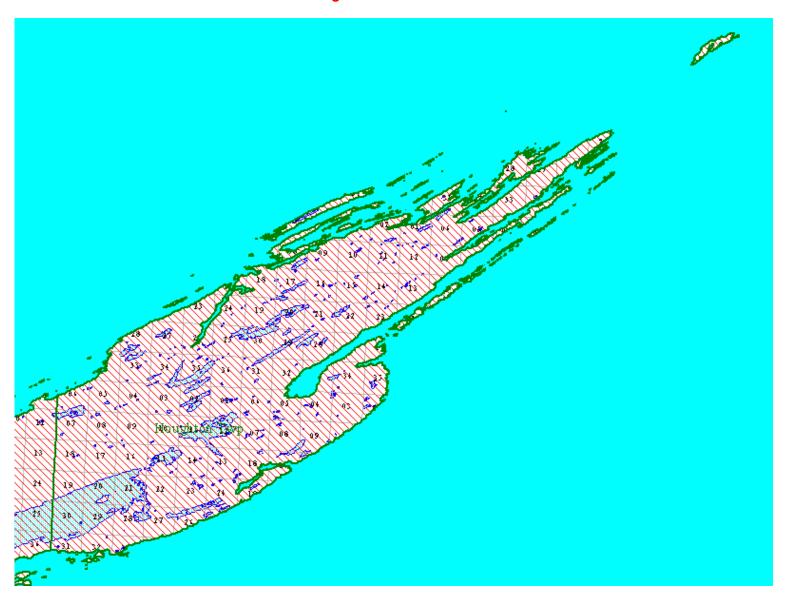
## **Keweenaw County -- Mainland Sherman Township, T56N R30W and T56 R31W**



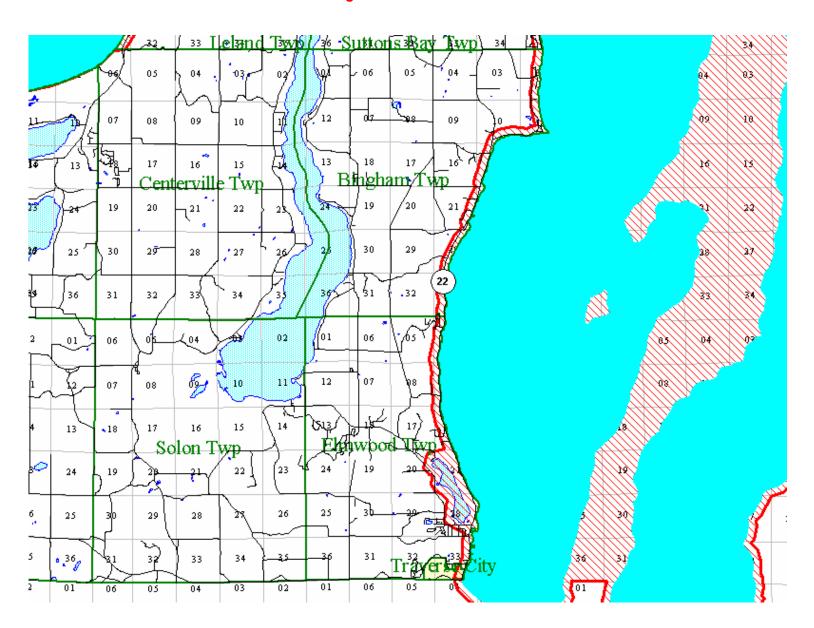
Keweenaw County – Isle Royal Eagle Harbor Township, T63N R39W, T63N R38W, T63N R37W, T63N R36W, T64N R39W, T64N R38W, T64N R37W, T64N R36W, T64N R35W, T65N R37W and T65N R36W



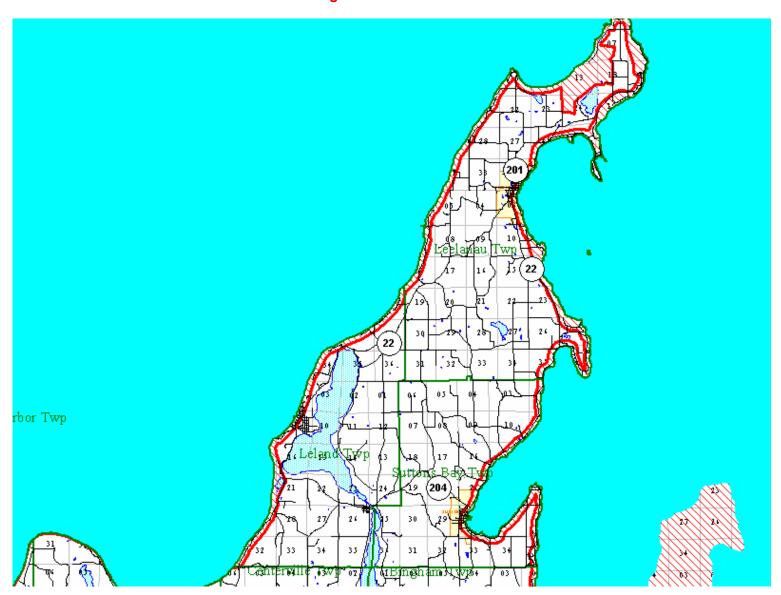
Keweenaw County – Isle Royal Houghton Township, T65N R35W, T65N R34W, T66N R35W, T66N R35W, T67N R33W, T67N R34W and T67N R32W



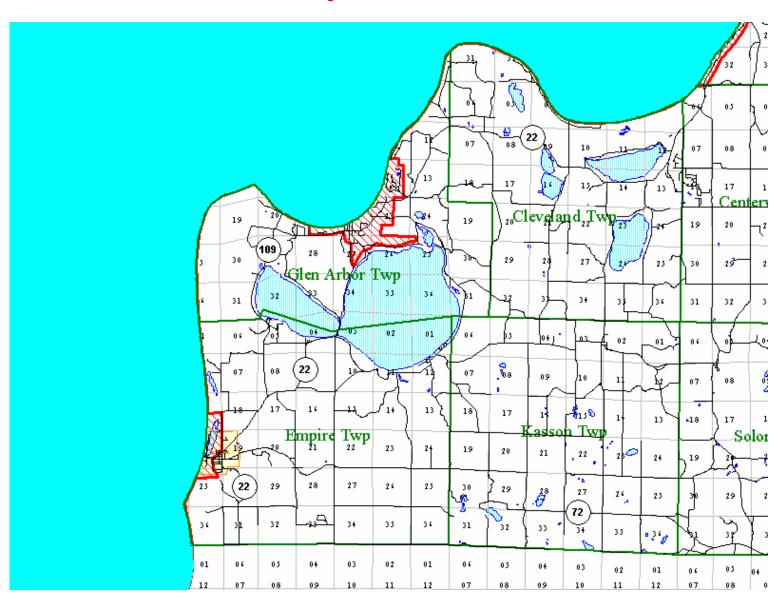
## Leelanau County Bingham Township, T29N R112W Elmwood Township, T28N R11W



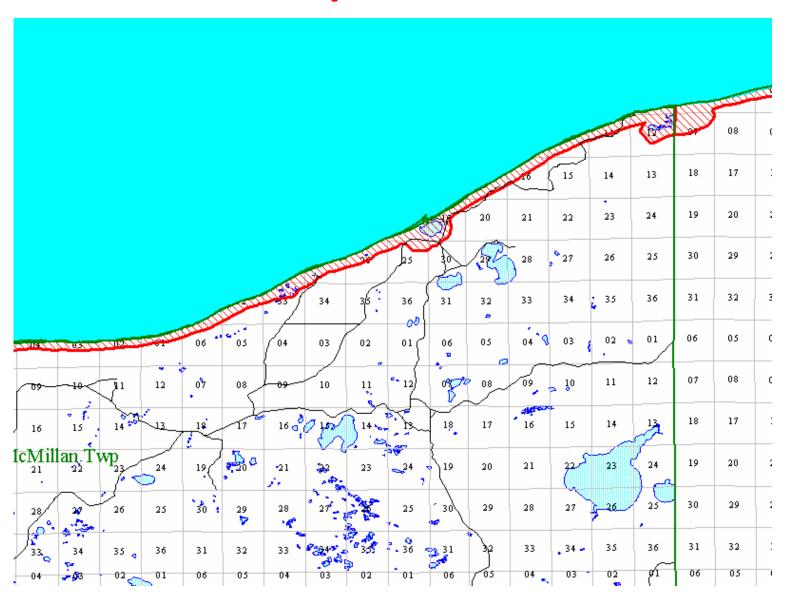
## Leelanau County Leland Township, T30N R12W and T31N R12W Leelanau Township, T31N R11W, T32N R10W and T32N R11W Suttons Bay Township, T30N R11W



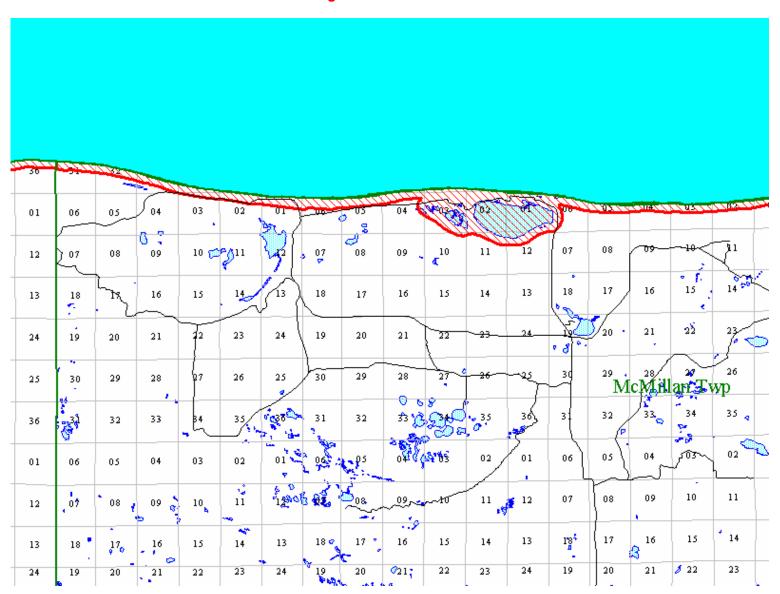
### Leelanau County Glen Arbor Township, T29N R14W Empire Township, T28N R15W Cleveland Township, none



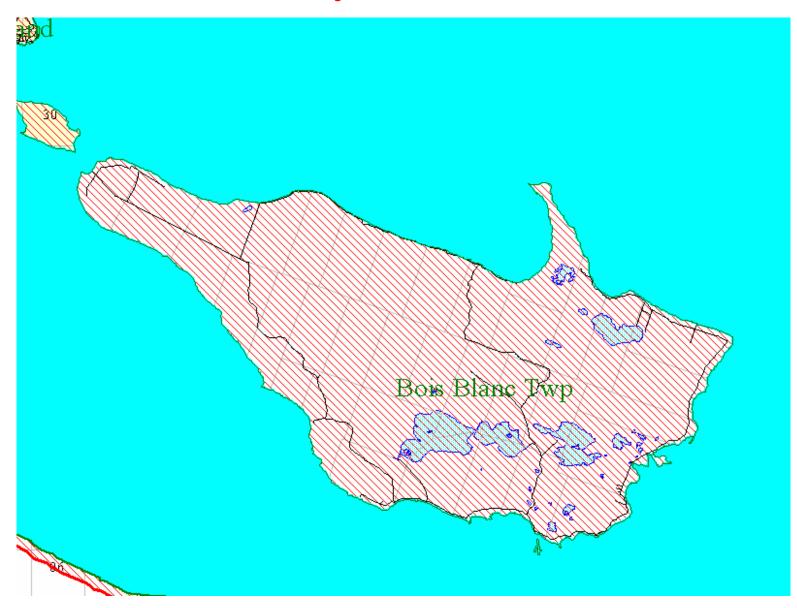
## Luce County McMillan Township, Eastern part, T49N R9W, T49N R10W, T50N R8W and T50N R9W



## Luce County McMillan Township, Western part, T49N R10W, T49N R11W, T49N R12W and T50N R12W



## Mackinac County Bois Blanc Township, T39N R1E, T39N R1W, T39N R2W and T40N R2W

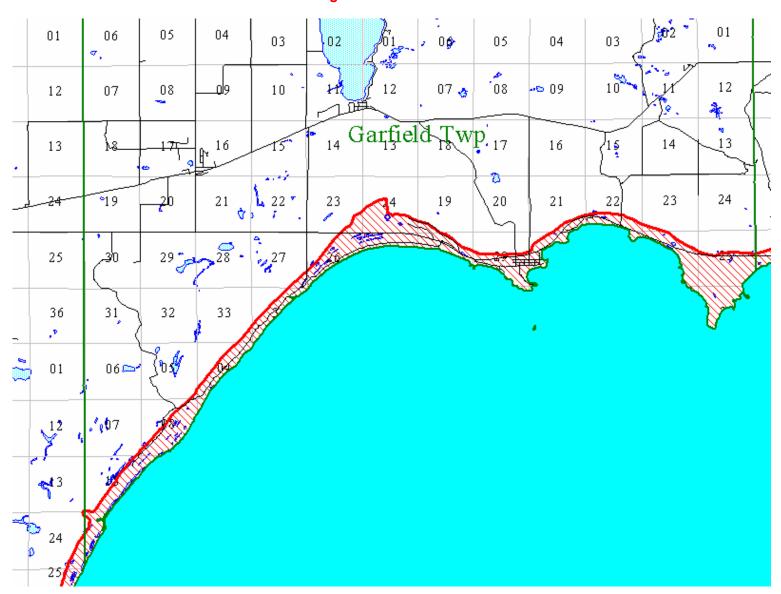


## **Mackinac County**

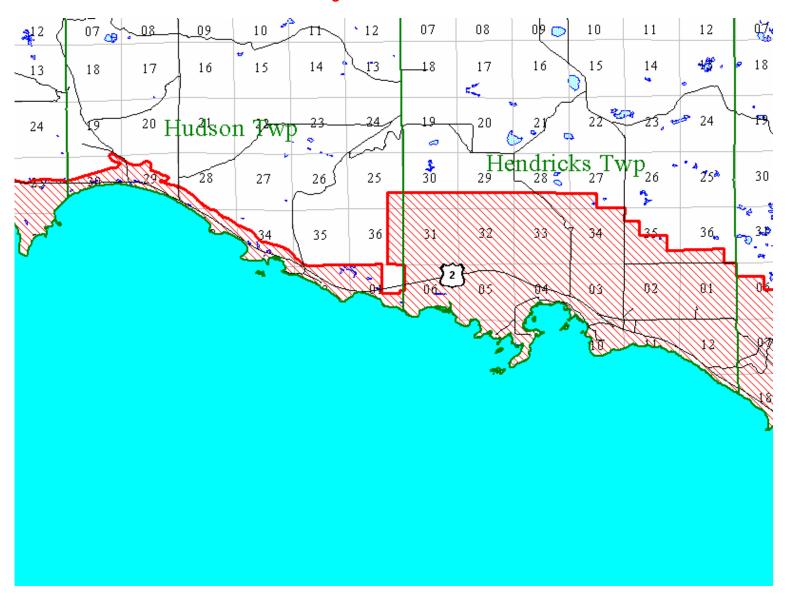
Clark Township, T41N R1E, T41N R2E, T42N R1E, T41N R1W and T42N R1W, The heavy red line is the Coastal Zone Management Boundary
The red hatched area is the Coastal Zone Management Area

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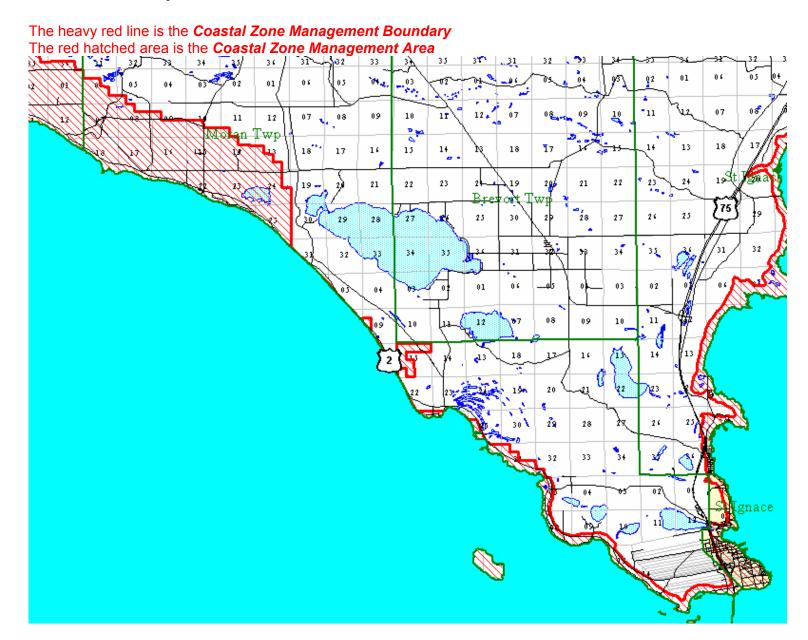
## Mackinac County Garfield Township, T42N R10W, T43N R9W and T43N R10W



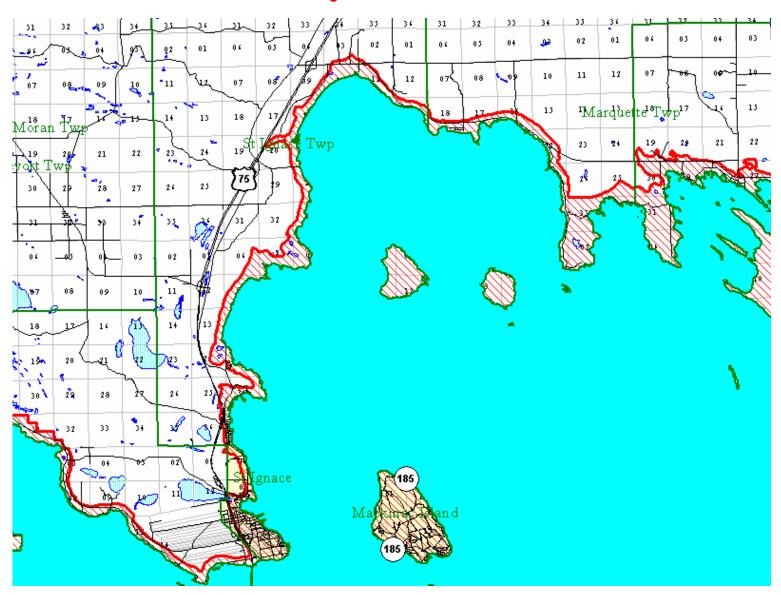
## Mackinac County Hendricks Township, T42N R7W and T43N R7W Hudson Township, T42N R8W and T43N R8W



## Mackinac County Moran Township, T40N R4W, T41N R4W, T41N R5E, T42N R5W and T42N R6W



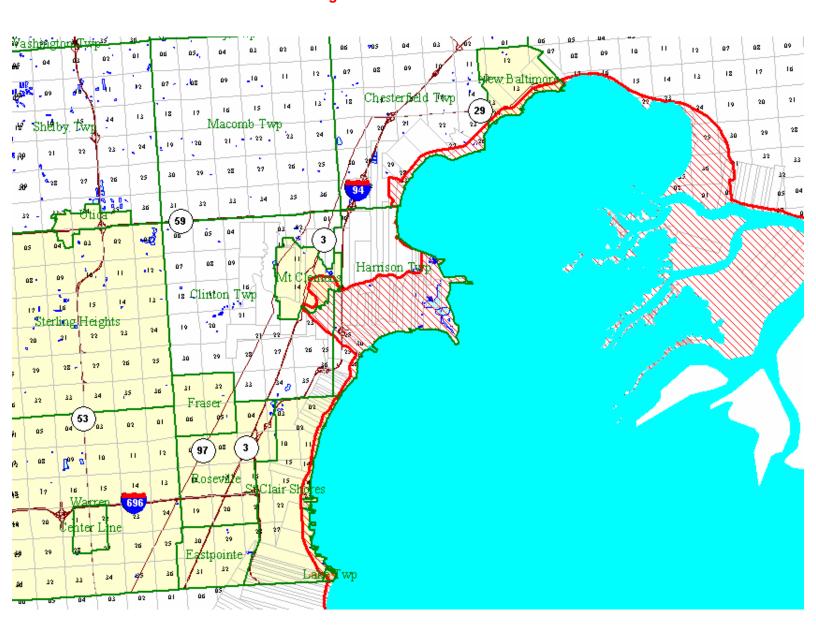
## Mackinac County Marquette Township, T41N R2W and T42N R2W St. Ignace Township, T40N R3W, T41N R3W, T41N R4E and T42N R3W



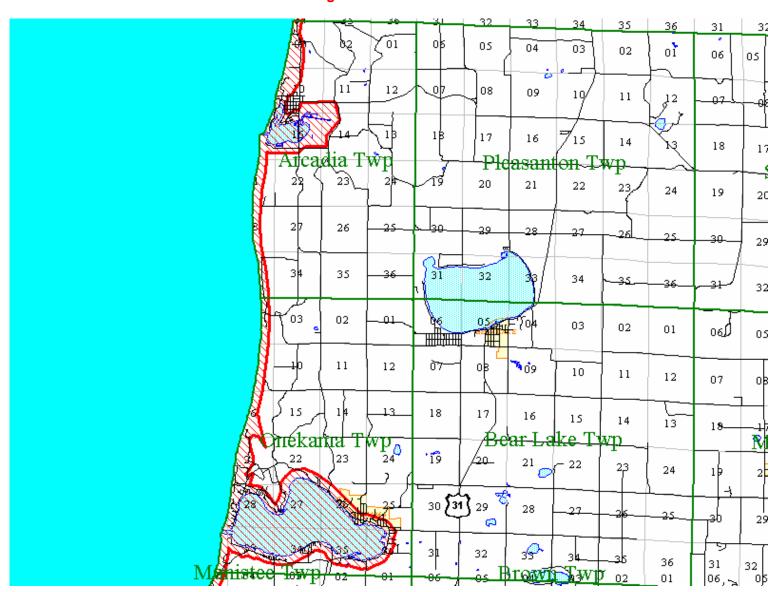
## Mackinac County Newton Township, T41N R11W, T41N R12W and T42N R11W

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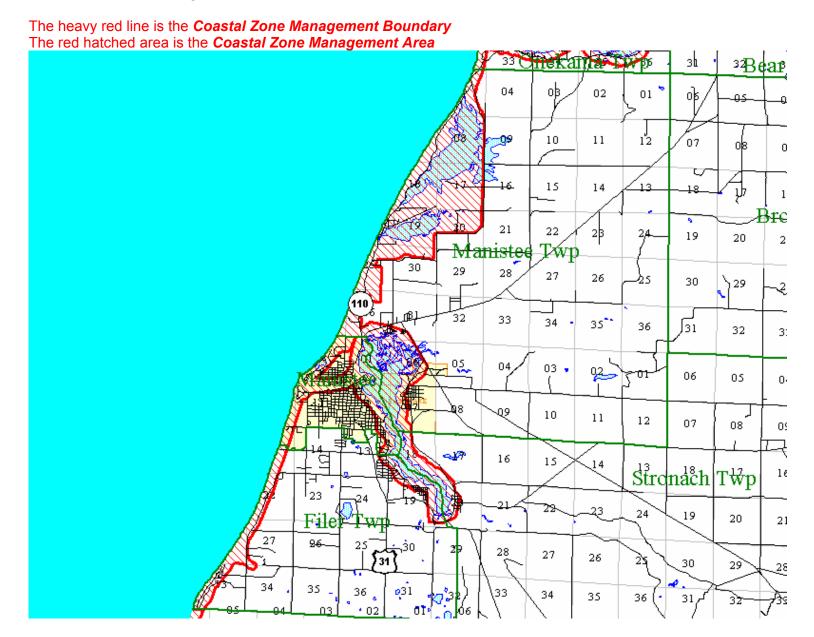
Macomb County Chesterfield Township, T3N R14E Harrison Township and Mt. Clemens, T2N R14E Clinton Township, T2N R13E, T2N R14E St. Clair Shores, T2N R13E, T1N R13E Lake Township, T1N R13E



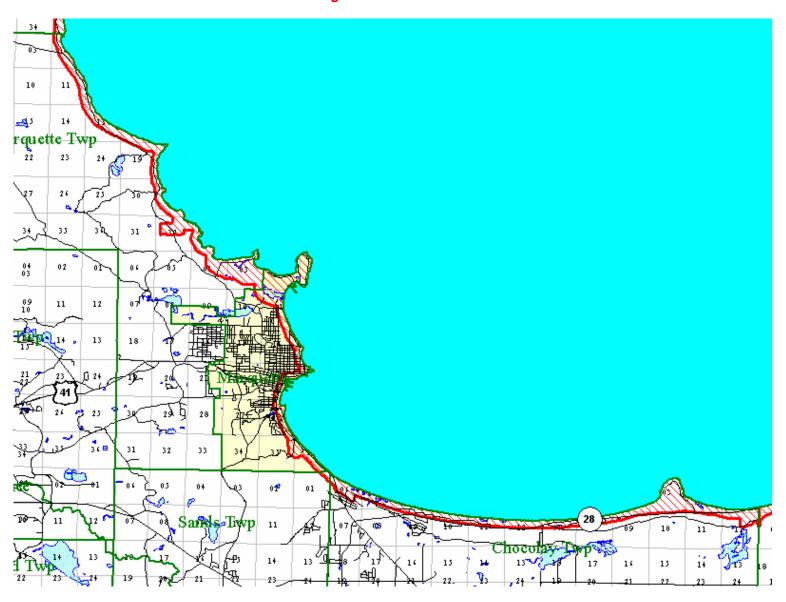
### Manistee County Arcadia Township, T24N R16W Onekama Township, T23N R16W



Manistee County Filer Township, T21N R16W Manistee Township, T22N R16W and T22N R17W Manistee, T21N R17W and T21N R16W Stronach Township, T21N R16W and T21N R17W



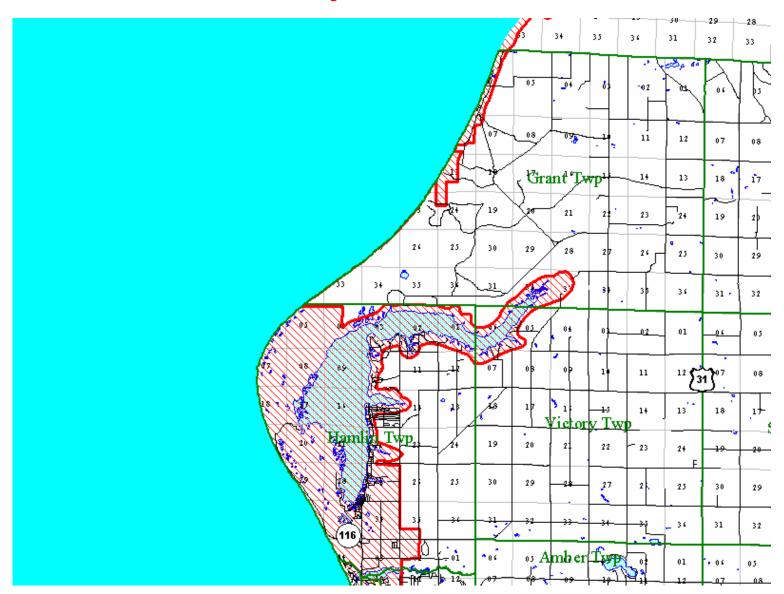
Marquette County Marquette Township, T48N R25W, T49N R25W and T49N R26W Sands Township, T48N R25W Chocolay Township, T47N R24W and T47N R23W



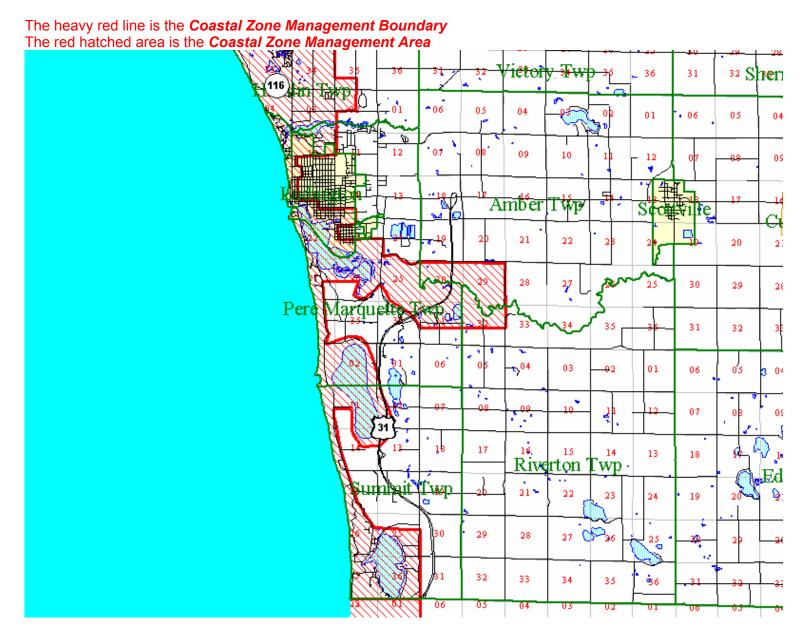
## Marquette County Powell Township, T50N R26W, T51N R26W, T51N R27W, T52N R27W, T52 R28W and T52N R29W

The heavy red line is the Coastal Zone Management Boundary The red hatched area is the Coastal Zone Management Area ŮĠ úΖ Powell Twp 30 <sup>\</sup> <u>3</u>4 07\_) (ia П 12 { hampion Two Ishpepring Typ ū5 ۵ı ūS Michigamme Marquett è П П 

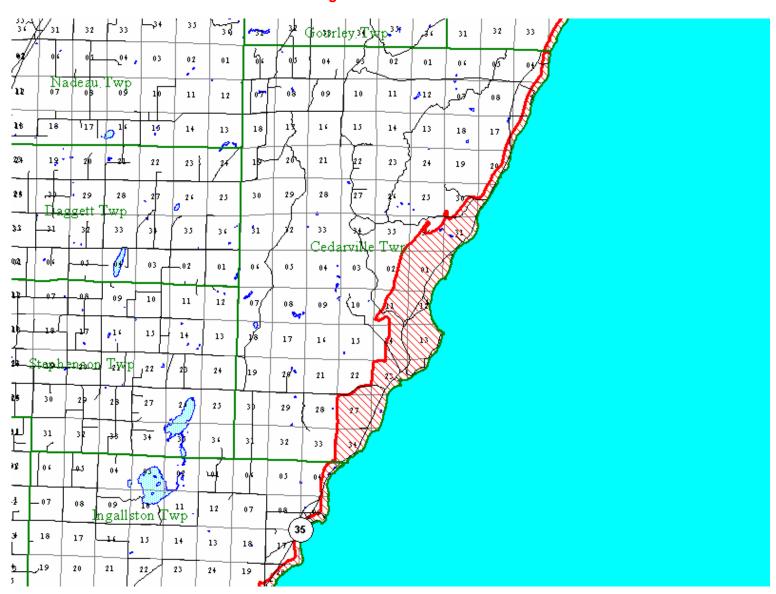
Mason County Grant Township, T20N R17W Hamlin Township, T19N R18W Victory Township, T19N R17W



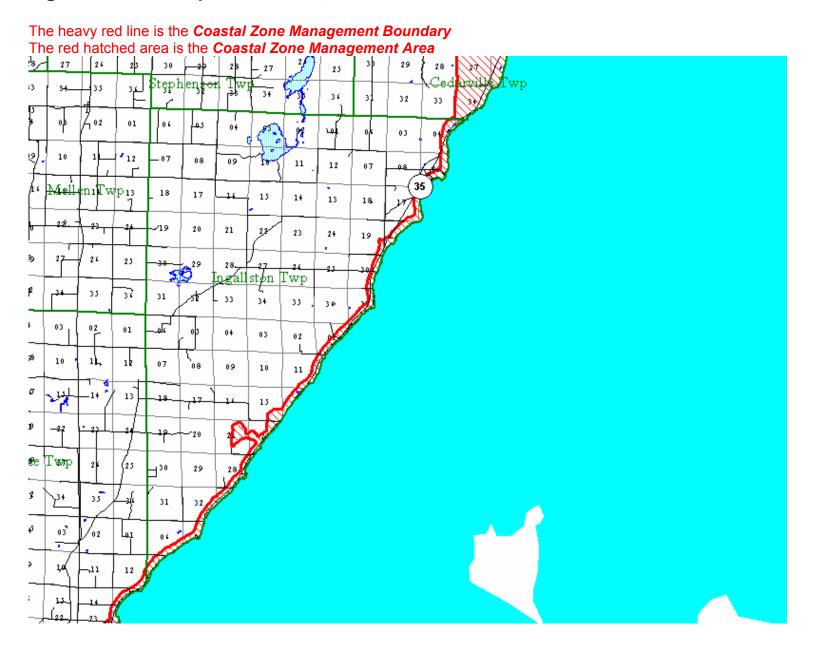
Mason County
Pere Marquette Township, T18N R18W, T18N R17W and T17N R18W
Ludington, T18N R18W
Amber Township, T18N R17W
Riverton Township, T18N R17W
Summit Township, T17N R18W



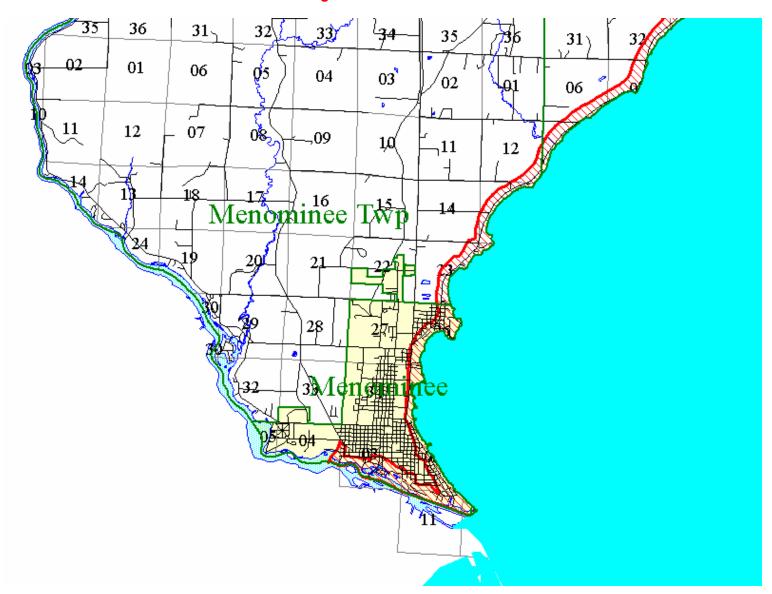
## Menominee County Cedarville Township, T35N R25W, T36N R24W and T36N R25W



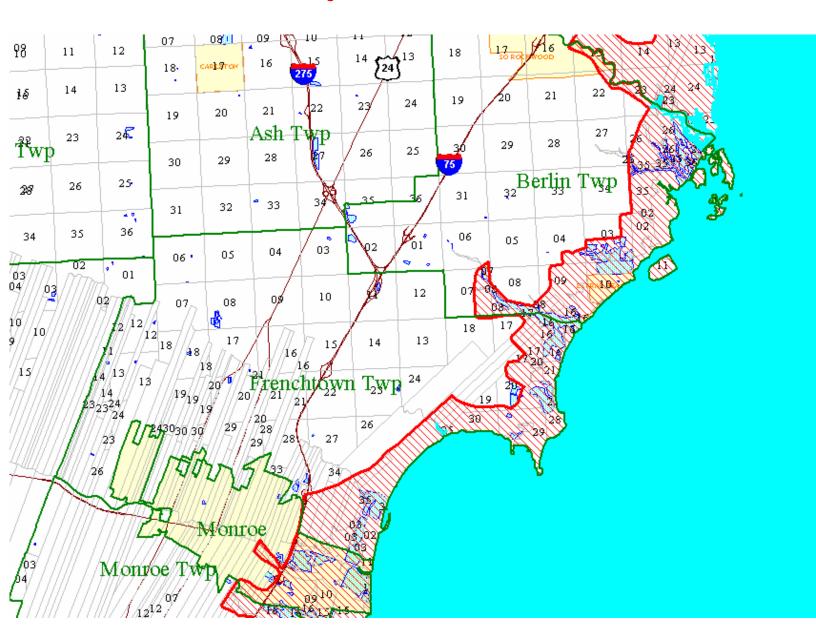
## Menominee County Ingallston Township, T32N R26W, T33N R25W, T33N R26W and T34N R25W



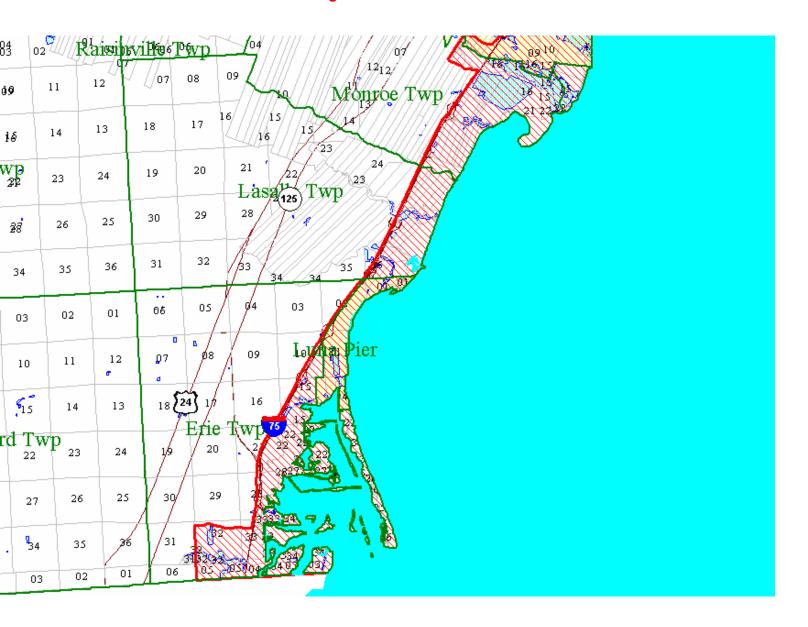
## Menominee County Menominee Township, T31N R27W and T32N R27W City of Menominee T31N R27W and T32N R27W



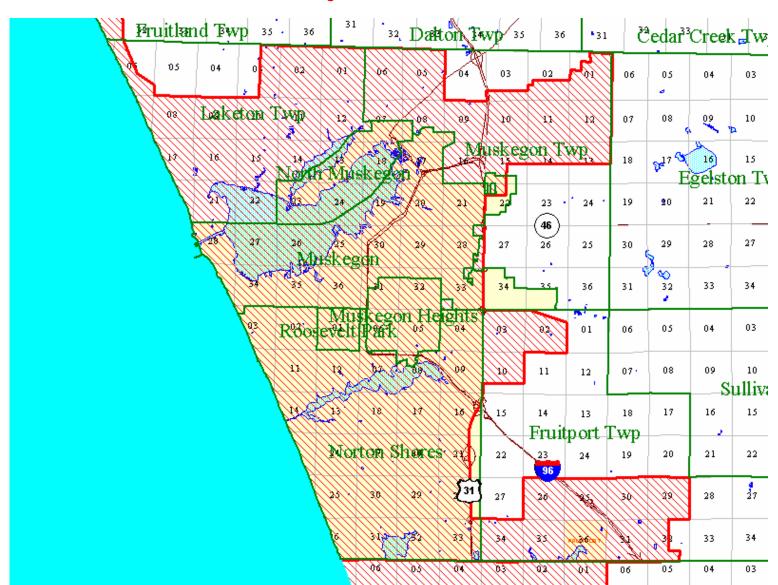
## Monroe County Berlin Township T8S R8E Frenchtown Township T7S R8E Monroe Township T7S R8E



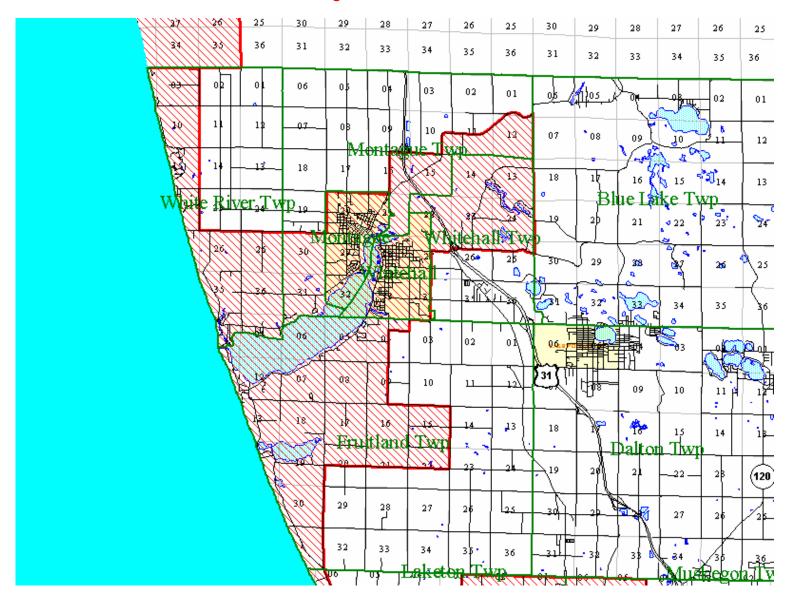
## Monroe County Erie Township T8S R8E LaSalle Township T7S R8E Monroe Township T7S R8E



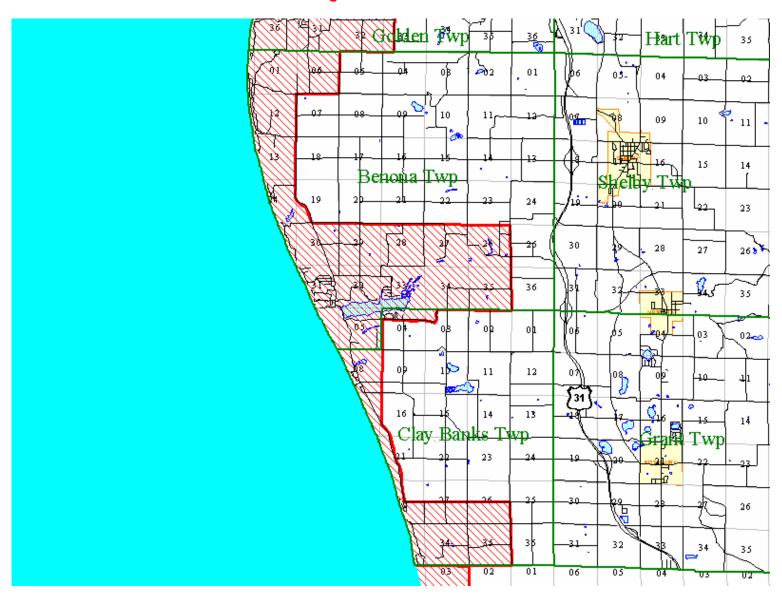
Muskegon County
Laketon Township, T10N R17W and T10N R18W
Muskegon Township, T10N R16W
North Muskegon, T10N R16W and T10N R17W
Muskegon, T10N R16W and T10N R17W
North Muskegon, T9N R16W and T10N R16W
Roosevelt Park, T9N R17W
Fruitport Township, T9N R15W and T9N R16W
Norton Shores, T9N R16W and T9N R15W



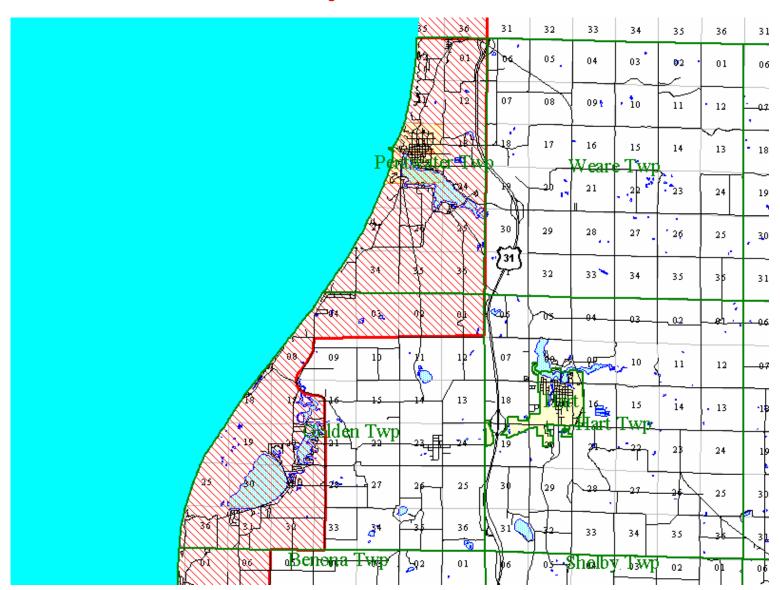
Muskegon County
White River Township, T12N R18W and T11N R18W
Montague Township, T12N R17W
Montague, T12N R17W
Whitehall, T12N R17W
Whitehall Township, T12N R17W
Fruitland Township, T11N R18W and T11N R17W



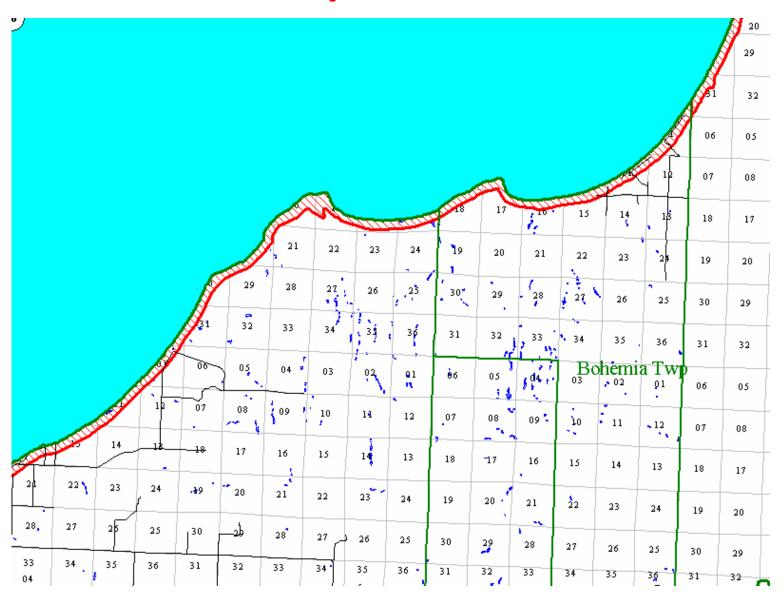
### Oceana County Benona Township, T14N R18W, T14N R19W and T13N R18W Clay Banks Township, T13N R18W



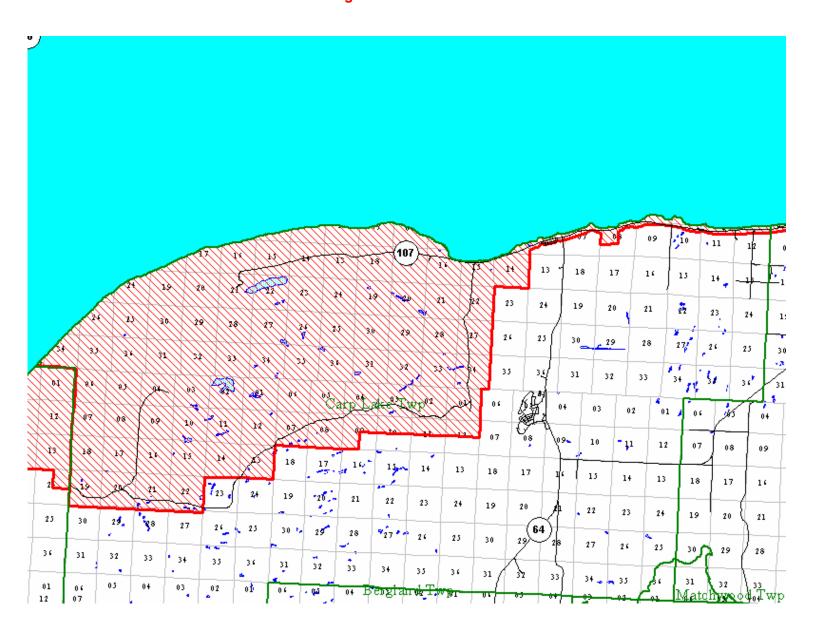
# Oceana County Pentwater Township, T16N R18W, T14N R19W and T13N R18W Golden Township, T15N R18W and T15N R19W



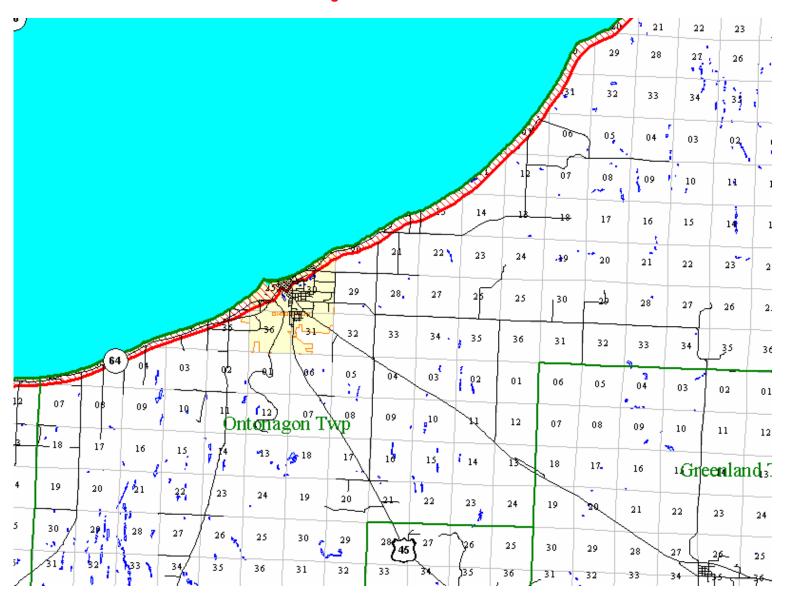
# Ontonagon County East Part of Ontonagon Township, T52N R39W, T53N R39W and T53N R38W Bohemia Township, T53N R37W and T54N R37W



# Ontonagon County Carp Lake Township, T51N R44W, T51N R43W, T51N R42W, T50N R43W and T50N R44W



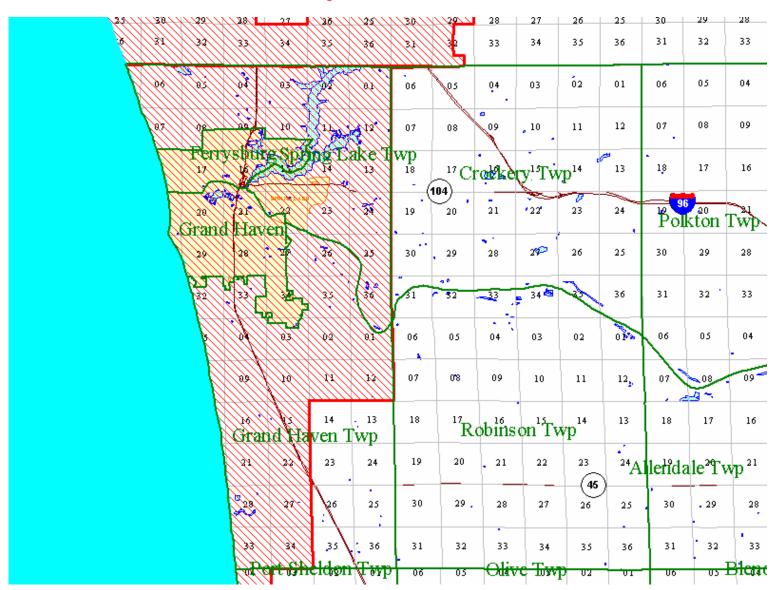
# Ontonagon County West Part of Ontonagon Township, T51N R40W, T52N R40W, T52N R39W, T53N R39W and T53N R38W



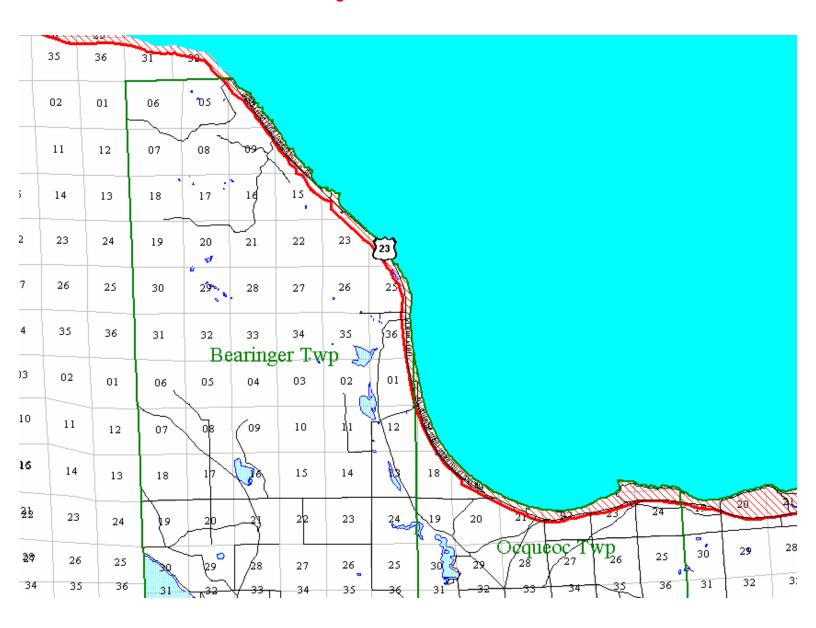
Ottawa County
Port Sheldon Township, T6N R16W
Park Township, T5N R16W
Holland Township T5N R15W
Holland, T5N R15W
Zeeland, T5N R15W

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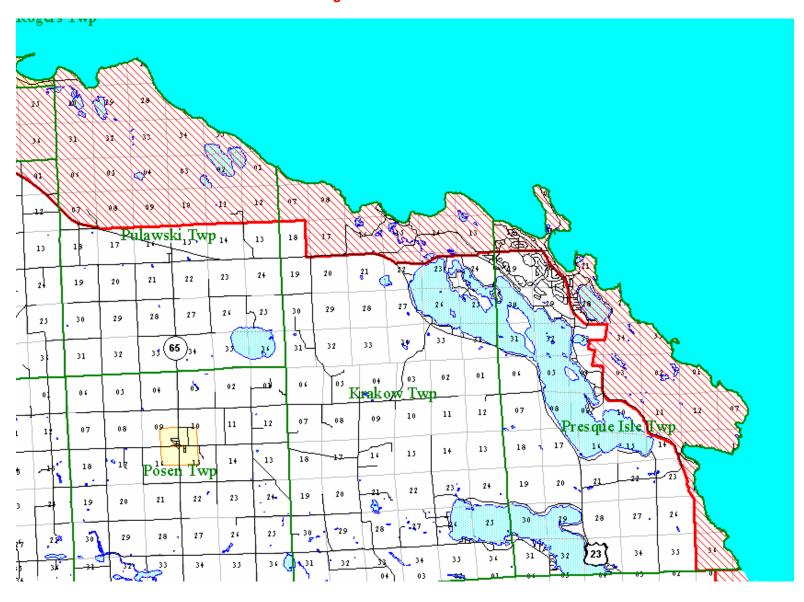
Ottawa County Spring Lake Township, T6N R17W and T8N R16W Ferrysburg, T8N R16W Grand Haven Township, T7N R16W T8N R16W Grand Haven T8N R16W



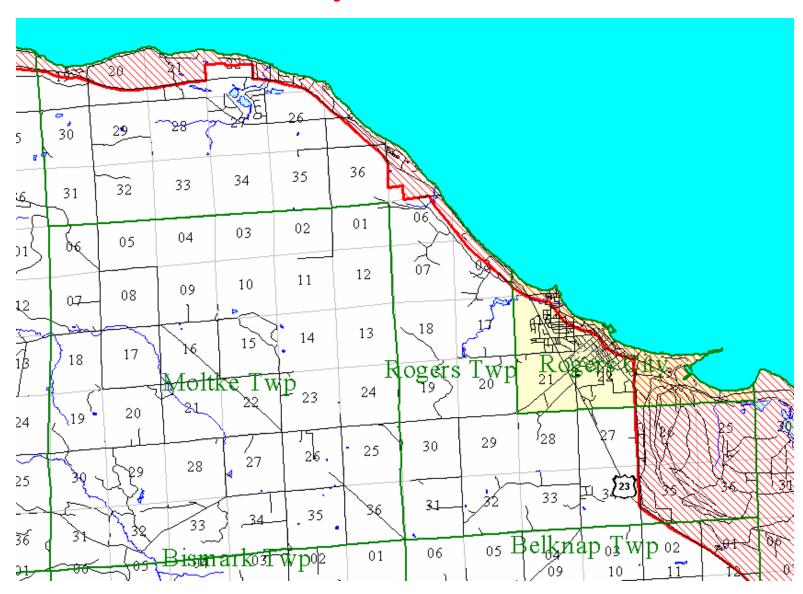
### Presque Isle County Bearinger Township, T37N R2E, T36 R2E Ocqueoc Township, T36N R3E



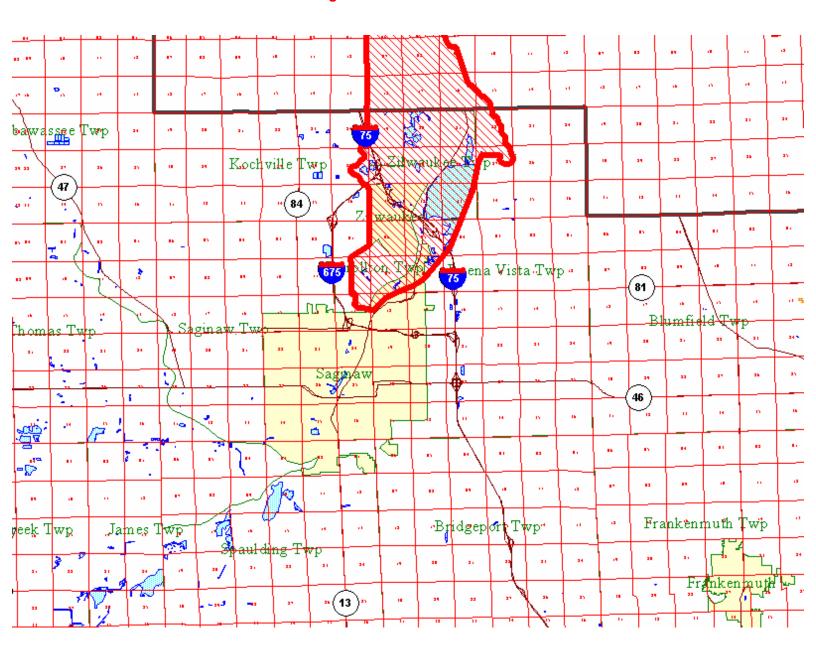
Presque Isle County
Pulawski Township, T35N R6E and T34 R6E
Krakow Township, T34N R7E
Presque Isle Township, T34N R8E, T33N R8E and T33 R9E



### Presque Isle County Rogers Township, T36N R4E, T36 R5E, T35N R6E and T35N R5E Belknap Township, T34N R8E



Saginaw County Kochville Township, T13N R4E Zilwaukee Township, T13N R5E Carrollton Township, T12N R4E Buena Vista Township, T12N R5E



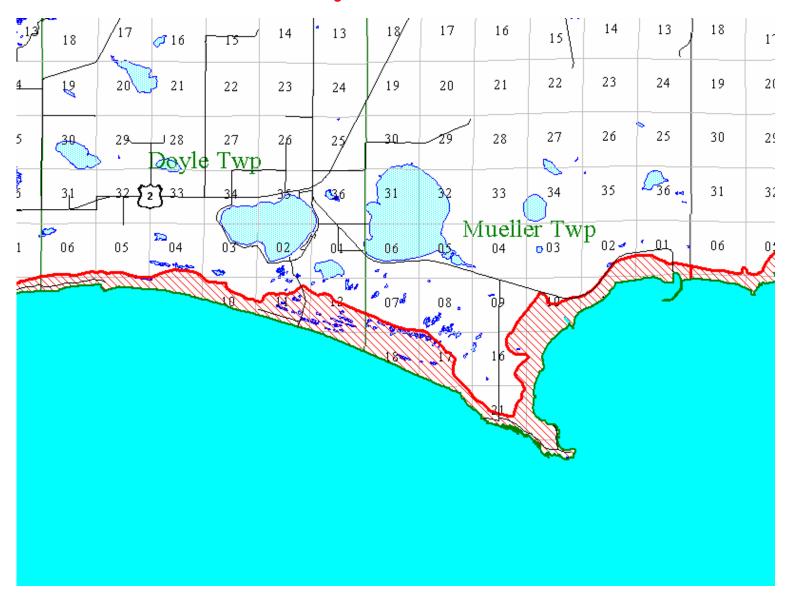
### Sanilac County Delaware Township, T14N R16E Forester Township T13N R16E Sanilac Township, T12N R16E



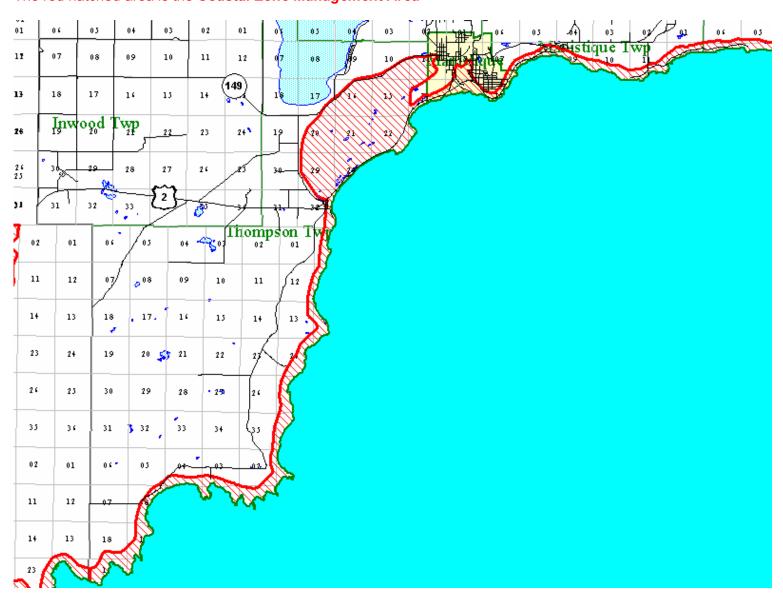
### Sanilac County Sanilac Township, T12N R16E Lexington Township T10N R17E Worth Township, T9N R17E



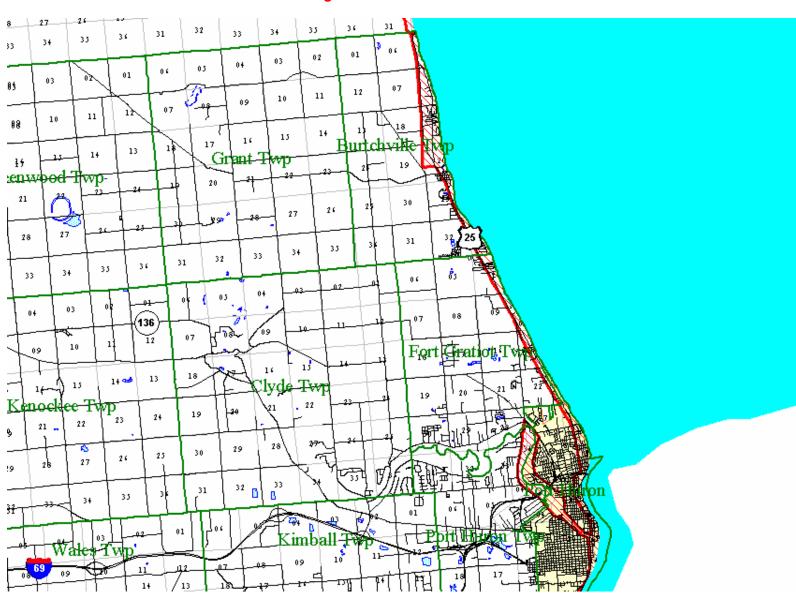
### Schoolcraft County Mueller Township, T41N R13W Doyle Township, T41N R14W



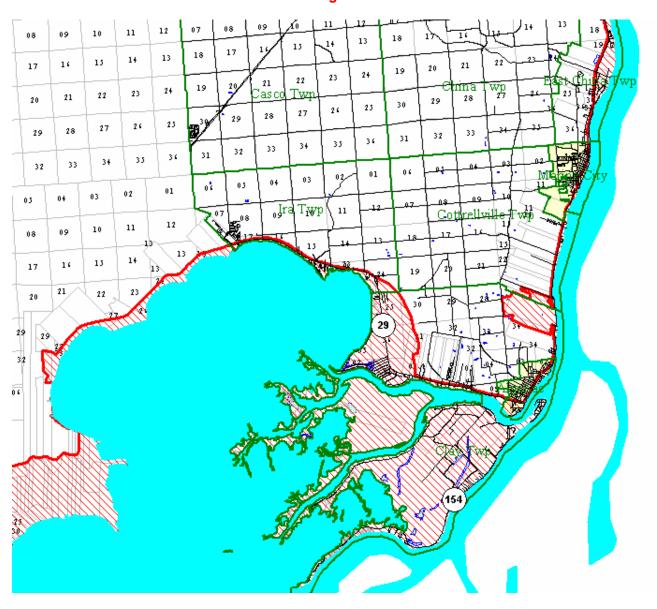
# Schoolcraft County Manistique Township, T41N R15W and T41N R16W Thompson Township, T39N R17W, T40N R16W, T40N R17W and T41N R16W



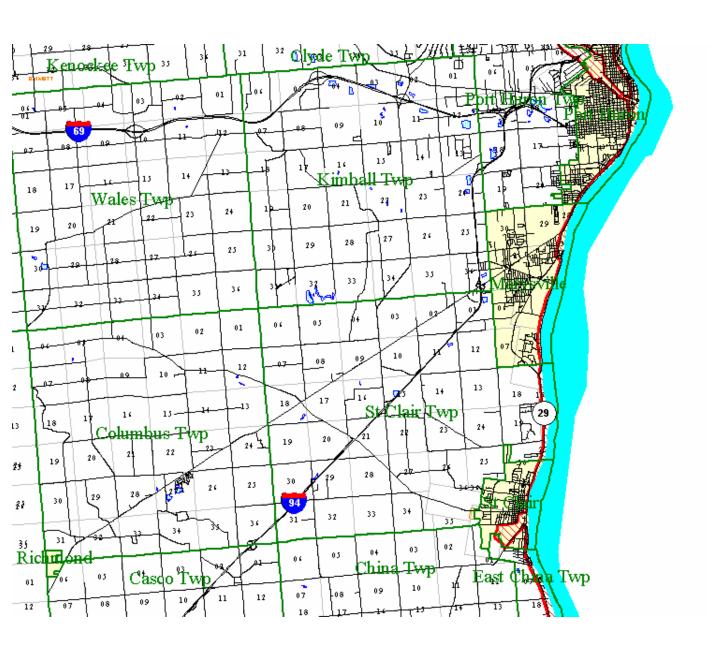
St. Clair County Burtchville Township, T8N R17E Fort Gratiot Township T7N R17E Port Huron, T7N R17E and T6N R17E



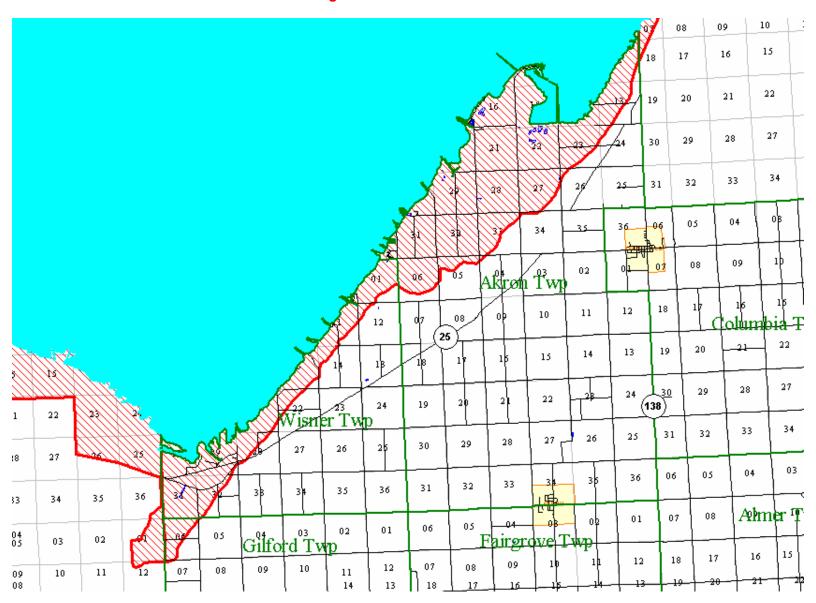
St. Clair County
East China Township, T4N R16E
Cottrellville Township and Marine City, T3N R16E
Algonac, T2N R16E
Clay Township, T3N R15E, T3N R16E, T2N R15E, and T2N R16E
Ira Township, T3N R15E



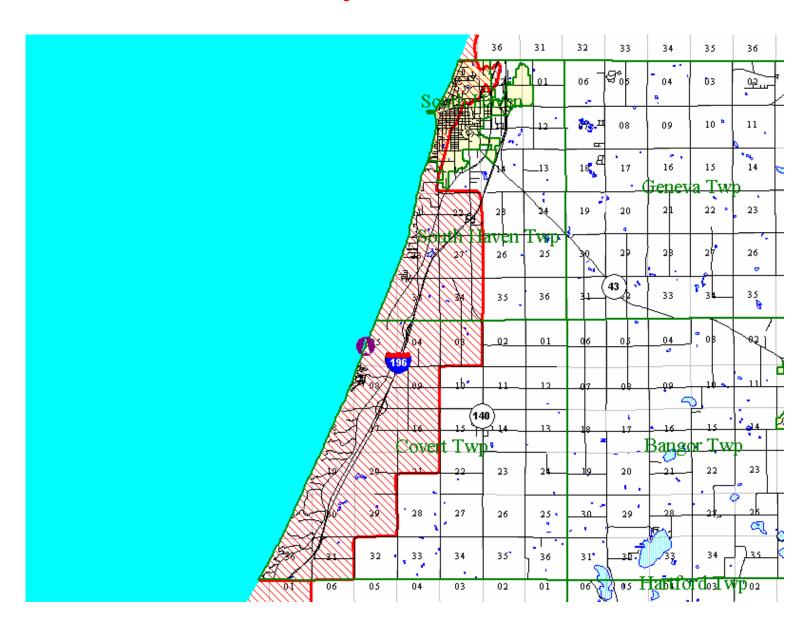
St. Clair County
Port Huron, T6N R17E
Marysville, T6N R17E and T5N R17E
St. Clair Township and St. Clair, T5N R17E
East China Township, T4N R17E



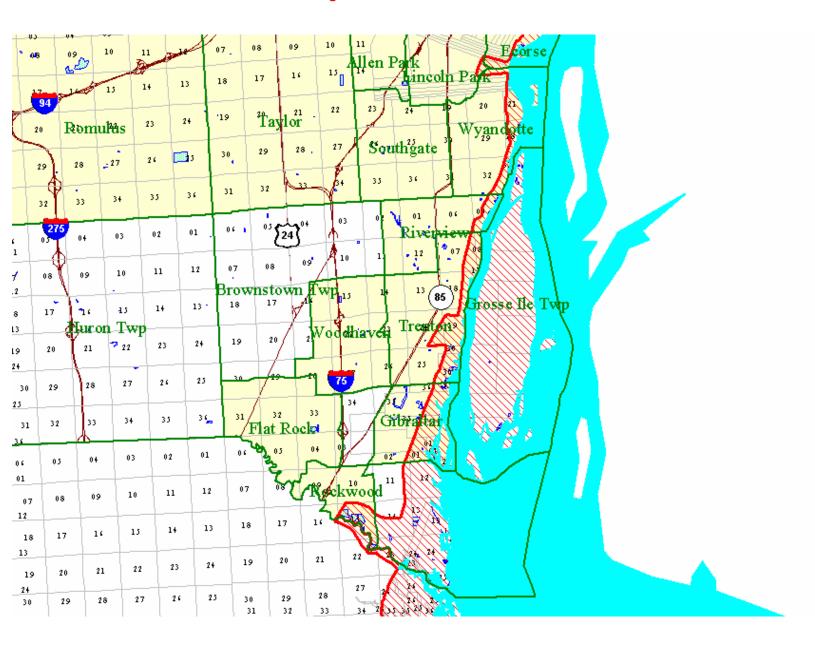
### Tuscola County Akron Township T15N R8E and T14N R8E Wisner Township, T14N R7E and T13N R6E



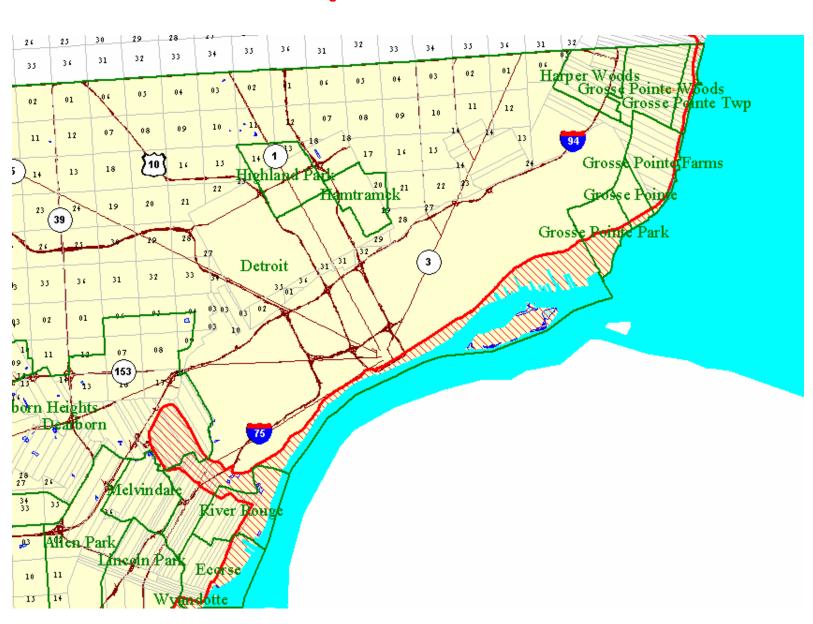
Van Buren County South Haven, T1S R17W South Haven Township, T1S R17W Covert Township, T2S R17W, and T2S R18W



# Wayne County Ecorse, Lincoln Park, Wyandotte and Riverview, T3S R11E Trenton, T4S R11E Rockwood, Gibraltar and Brownstown Township T5S R10E



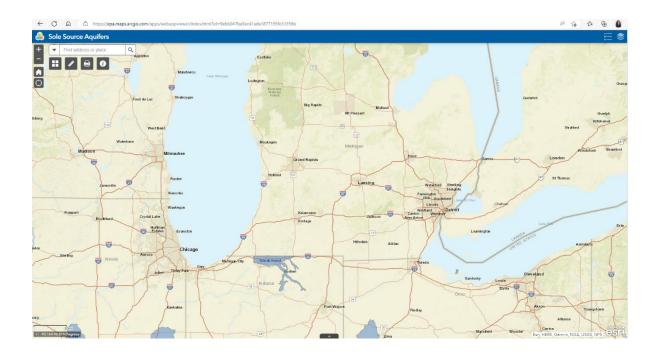
Wayne County
Grosse Point Township, Grosse Point Woods, Grosse Point Farms
Grosse Point, Grosse Point Park, and Detroit, T1S R14E
Detroit, T1S R14E, T2S R13E, andT2S R12E
River Rouge, T2S R11E



### **Attachment 3**

### **Water Quality**

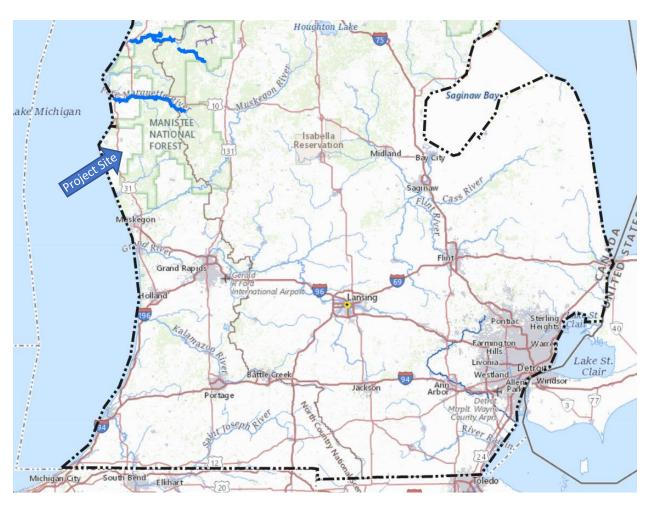
The Environmental Protection Agency's (EPA) Sole Source Aquifers GIS database was reviewed for the project region. The location of the project will not impact any aquifer. As such, water quality will not be negatively impacted by this project.



### **Attachment 4**

#### Wild and Scenic Rivers

The APE for the proposed project was not identified to be in proximity of a designated wild and scenic river for the state of Michigan. As such, no wild and scenic rivers will be impacted by the proposed project.



Source: Nationwide Rivers Inventory

### **Attachment 5**

#### **Wetlands Protection**

The Fish and Wildlife Service (FWS) National Wetlands Inventory (NWI) for surface waters and wetlands was reviewed for the project region. The APE for the project was georeferenced with the NWI map, which is attached below. The APE does not fall within any identified surface waters and/or wetlands. As such, this project is not located in, nor will it impact, wetlands.



### U.S. Fish and Wildlife Service

### National Wetlands Inventory

### Shelby Township, Michigan



December 29, 2022

#### Wetlands

Estuarine and Marine Deepwater

Estuarine and Marine Wetland

Freshwater Emergent Wetland

Freshwater Forested/Shrub Wetland

Freshwater Pond

Lake

Other

Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

### **Attachment 6**

### **Endangered Species**

The APE for the proposed project is limited to existing easements, road right-of-ways, and municipally owned property designated for the project, which will not include suitable habitats for flora or fauna. Additionally, the FWS Official Species List for the project region was reviewed and is attached below. No critical habitats were identified within the scope of the proposed project. As such, it has been concluded that no threatened and/or endangered species will be impacted by the proposed project.



### United States Department of the Interior



#### FISH AND WILDLIFE SERVICE

Michigan Ecological Services Field Office 2651 Coolidge Road Suite 101 East Lansing, MI 48823-6360

Phone: (517) 351-2555 Fax: (517) 351-1443

In Reply Refer To: December 29, 2022

Project Code: 2023-0029227

Project Name: Shelby Watermain Extension and Booster Station Project

Subject: List of threatened and endangered species that may occur in your proposed project

location or may be affected by your proposed project

To Whom It May Concern:

### **Official Species List**

The attached species list identifies any Federally threatened, endangered, proposed and candidate species that may occur within the boundary of your proposed project or may be affected by your proposed project. The list also includes designated critical habitat if present within your proposed project area or affected by your project. This list is provided to you as the initial step of the consultation process required under section 7(c) of the Endangered Species Act, also referred to as Section 7 Consultation.

Under 50 CFR 402.12(e) (the regulations that implement section 7 of the Endangered Species Act), the accuracy of this species list should be verified after 90 days. You may verify the list by visiting the IPaC website (<a href="https://ipac.ecosphere.fws.gov/">https://ipac.ecosphere.fws.gov/</a>) at regular intervals during project planning and implementation. To update an Official Species List in IPaC: from the My Projects page, find the project, expand the row, and click Project Home. In the What's Next box on the Project Home page, there is a Request Updated List button to update your species list. Be sure to select an "official" species list for all projects.

### Consultation requirements and next steps

Section 7 of the Endangered Species Act of 1973 requires that actions authorized, funded, or carried out by Federal agencies not jeopardize Federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-Federal representative) must consult with the Fish and Wildlife Service if they determine their project may affect listed species or critical habitat.

There are two approaches to evaluating the effects of a project on listed species.

Approach 1. Use the All-species Michigan determination key in IPaC. This tool can assist you in making determinations for listed species for some projects. In many cases, the determination key 12/29/2022 2

will provide an automated concurrence that completes all or significant parts of the consultation process. Therefore, we strongly recommend screening your project with the **All-Species Michigan Determination Key (Dkey)**. For additional information on using IPaC and available Determination Keys, visit <a href="https://www.fws.gov/media/mifo-ipac-instructions">https://www.fws.gov/media/mifo-ipac-instructions</a> (and click on the attachment). Please carefully review your Dkey output letter to determine whether additional steps are needed to complete the consultation process.

Approach 2. Evaluate the effects to listed species on your own without utilizing a determination key. Once you obtain your official species list, you are not required to continue in IPaC, although in most cases using a determination key should expedite your review. If the project is a Federal action, you should review our section 7 step-by-step instructions before making your determinations: <a href="https://www.fws.gov/office/midwest-region-headquarters/midwest-section-7-technical-assistance">https://www.fws.gov/office/midwest-region-headquarters/midwest-section-7-technical-assistance</a>. If you evaluate the details of your project and conclude "no effect," document your findings, and your listed species review is complete; you do not need our concurrence on "no effect" determinations. If you cannot conclude "no effect," you should coordinate/consult with the Michigan Ecological Services Field Office. The preferred method for submitting your project description and effects determination (if concurrence is needed) is electronically to EastLansing@fws.gov. Please include a copy of this official species list with your request.

For all **wind energy projects** and **projects that include installing communications towers that use guy wires**, please contact this field office directly for assistance, even if no Federally listed plants, animals or critical habitat are present within your proposed project area or may be affected by your proposed project.

#### **Migratory Birds**

Please see the "Migratory Birds" section below for important information regarding incorporating migratory birds into your project planning. Our Migratory Bird Program has developed recommendations, best practices, and other tools to help project proponents voluntarily reduce impacts to birds and their habitats. The Bald and Golden Eagle Protection Act prohibits the take and disturbance of eagles without a permit. If your project is near an eagle nest or winter roost area, see our Eagle Permits website at <a href="https://www.fws.gov/program/eagle-management/eagle-permits">https://www.fws.gov/program/eagle-management/eagle-permits</a> to help you avoid impacting eagles or determine if a permit may be necessary.

Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <a href="https://www.fws.gov/partner/council-conservation-migratory-birds">https://www.fws.gov/partner/council-conservation-migratory-birds</a>.

We appreciate your consideration of threatened and endangered species during your project

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planning. Please include a copy of this letter with any request for consultation or correspondence about your project that you submit to our office.

### Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

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### **Official Species List**

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Michigan Ecological Services Field Office 2651 Coolidge Road Suite 101 East Lansing, MI 48823-6360 (517) 351-2555

# **Project Summary**

Project Code: 2023-0029227

Project Name: Shelby Watermain Extension and Booster Station Project
Project Type: Water Supply Pipeline - New Constr - Below Ground

Project Description: Watermain extension and construction of new booster station to provide

municipal water to nine new apartment buildings.

#### **Project Location:**

Approximate location of the project can be viewed in Google Maps: <a href="https://www.google.com/maps/@43.64739725,-86.34826347981624,14z">https://www.google.com/maps/@43.64739725,-86.34826347981624,14z</a>



Counties: Oceana County, Michigan

# **Endangered Species Act Species**

There is a total of 10 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 2 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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.

#### **Mammals**

NAME STATUS

#### Indiana Bat *Myotis sodalis*

Endangered

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.

Species profile: https://ecos.fws.gov/ecp/species/5949

General project design guidelines:

 $\underline{https://ipac.ecosphere.fws.gov/project/5KEVDDTSUJH6TF7TEFMGRDJ7AU/documents/generated/6982.pdf}$ 

#### Northern Long-eared Bat Myotis septentrionalis

Endangered

No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a>

General project design guidelines:

 $\underline{https://ipac.ecosphere.fws.gov/project/5KEVDDTSUJH6TF7TEFMGRDJ7AU/documents/generated/6983.pdf}$ 

#### Tricolored Bat *Perimyotis subflavus*

No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/10515">https://ecos.fws.gov/ecp/species/10515</a>

Proposed Endangered 12/29/2022 4

#### **Birds**

NAME **STATUS** 

#### Piping Plover Charadrius melodus

Endangered

Population: [Great Lakes watershed DPS] - Great Lakes, watershed in States of IL, IN, MI, MN,

NY, OH, PA, and WI and Canada (Ont.)

There is **final** critical habitat for this species. Your location does not overlap the critical habitat.

Species profile: https://ecos.fws.gov/ecp/species/6039

#### Red Knot Calidris canutus rufa

Threatened

There is **proposed** critical habitat for this species.

This species only needs to be considered under the following conditions:

• Only actions that occur along coastal areas during the Red Knot migratory window of MAY 1 - SEPTEMBER 30.

Species profile: https://ecos.fws.gov/ecp/species/1864

#### Whooping Crane Grus americana

Population: U.S.A. (AL, AR, CO, FL, GA, ID, IL, IN, IA, KY, LA, MI, MN, MS, MO, NC, NM, OH, SC, TN, UT, VA, WI, WV, western half of WY)

No critical habitat has been designated for this species.

Species profile: <a href="https://ecos.fws.gov/ecp/species/758">https://ecos.fws.gov/ecp/species/758</a>

Experimental Population,

Non-Essential

## **Reptiles**

NAME **STATUS** 

#### Eastern Massasauga (=rattlesnake) Sistrurus catenatus

Threatened

No critical habitat has been designated for this species.

This species only needs to be considered under the following conditions:

• For all Projects: Project is within EMR Range

Species profile: <a href="https://ecos.fws.gov/ecp/species/2202">https://ecos.fws.gov/ecp/species/2202</a>

General project design guidelines:

https://ipac.ecosphere.fws.gov/project/5KEVDDTSUJH6TF7TEFMGRDJ7AU/documents/ generated/5280.pdf

#### Insects

**NAME STATUS** 

#### Karner Blue Butterfly Lycaeides melissa samuelis

Endangered

There is **proposed** critical habitat for this species.

Species profile: <a href="https://ecos.fws.gov/ecp/species/6656">https://ecos.fws.gov/ecp/species/6656</a>

#### Monarch Butterfly *Danaus plexippus*

Candidate

No critical habitat has been designated for this species.

Species profile: https://ecos.fws.gov/ecp/species/9743

## Flowering Plants

NAME **STATUS** 

#### Pitcher's Thistle *Cirsium pitcheri*

Threatened

No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8153

# **Critical habitats**

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

# USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the <u>National Wildlife Refuge</u> 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 OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

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# **Migratory Birds**

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

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.
- 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

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
American Golden-plover <i>Pluvialis dominica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Bald Eagle <i>Haliaeetus leucocephalus</i> 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.	Breeds Dec 1 to Aug 31
Bobolink <i>Dolichonyx oryzivorus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31

NAME	BREEDING SEASON
Canada Warbler <i>Cardellina canadensis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Aug 10
Chimney Swift <i>Chaetura pelagica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Lesser Yellowlegs <i>Tringa flavipes</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9679">https://ecos.fws.gov/ecp/species/9679</a>	Breeds elsewhere
Ruddy Turnstone <i>Arenaria interpres morinella</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Rusty Blackbird <i>Euphagus carolinus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Short-billed Dowitcher <i>Limnodromus griseus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9480">https://ecos.fws.gov/ecp/species/9480</a>	Breeds elsewhere
Wood Thrush <i>Hylocichla mustelina</i> 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.

#### **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 (|)

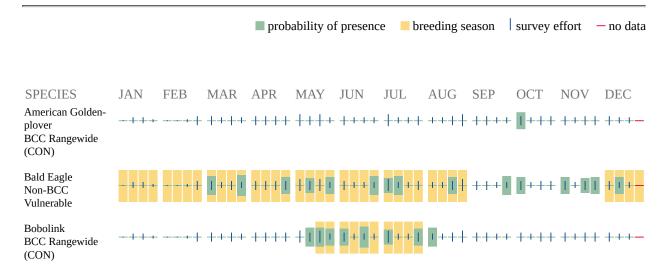
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

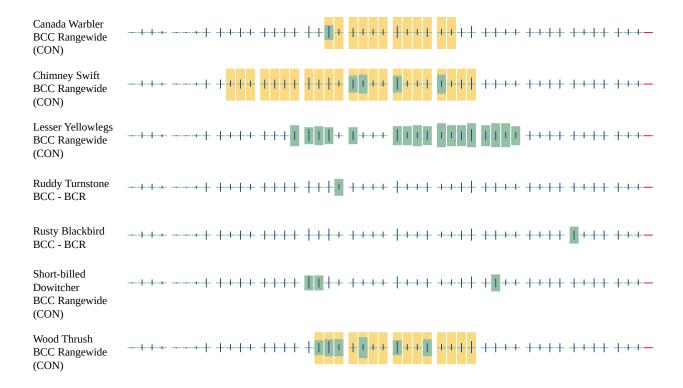
#### No Data (-)

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.





Additional information can be found using the following links:

- Birds of Conservation Concern <a href="https://www.fws.gov/program/migratory-birds/species">https://www.fws.gov/program/migratory-birds/species</a>
- Measures for avoiding and minimizing impacts to birds <a href="https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds">https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds</a>
- Nationwide conservation measures for birds <a href="https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf">https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf</a>

# **Migratory Birds FAQ**

# 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 list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS <u>Birds of Conservation Concern</u> (<u>BCC</u>) 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 <u>Avian Knowledge Network (AKN)</u>. The AKN data is based on a growing collection of <u>survey</u>, <u>banding</u>, <u>and citizen science datasets</u> 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 (<u>Eagle Act</u> 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 <a href="Rapid Avian Information">Rapid Avian Information</a> Locator (RAIL) 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 <u>Avian Knowledge Network (AKN)</u>. This data is derived from a growing collection of <u>survey</u>, <u>banding</u>, <u>and citizen science datasets</u>.

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 or migrating in my 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 query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. 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 <u>Birds of Conservation Concern</u> (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 <a href="Eagle Act">Eagle Act</a> 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 <u>Diving Bird Study</u> and the <u>nanotag studies</u> or contact <u>Caleb Spiegel</u> or <u>Pam Loring</u>.

#### What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to <u>obtain a permit</u> 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.

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# **Wetlands**

Impacts to <u>NWI wetlands</u> 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>U.S. Army Corps of Engineers District</u>.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER POND

■ <u>PUBGx</u>

# **IPaC User Contact Information**

Agency: Shelby township Name: Hailey Cantrell

Address: 2960 Interstate Pkwy

City: Kalamazoo

State: MI Zip: 49048

Email cantrell@envirologic.com

Phone: 2693421100

# **Lead Agency Contact Information**

Lead Agency: Department of Housing and Urban Development

# **Attachment 7**

## **Floodplain Analysis**

The Federal Emergency Management Agency (FEMA) National Flood Hazard Layer available for the project region was reviewed. The APE for the project was georeferenced and two FIRMettes are attached below. The APE falls into Flood Zone X, an area of minimal flood hazard. Zone X is defined as areas with a 0.2% annual chance of flood; areas of 1% annual chance of flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance of flood. As such, this project is not located in, nor will it impact, floodplain(s).

# National Flood Hazard Layer FIRMette

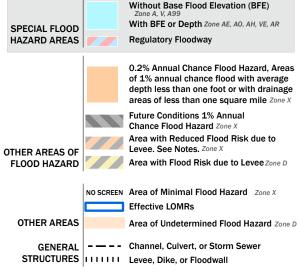


Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020



#### Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT



17.5 Water Surface Elevation **Coastal Transect** ₩ 513 W Base Flood Elevation Line (BFE) Limit of Study Jurisdiction Boundary **Coastal Transect Baseline** OTHER **Profile Baseline FEATURES** Hydrographic Feature

> Digital Data Available No Digital Data Available Unmapped

MAP PANELS

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

20.2 Cross Sections with 1% Annual Chance

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 12/29/2022 at 12:30 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

# National Flood Hazard Layer FIRMette

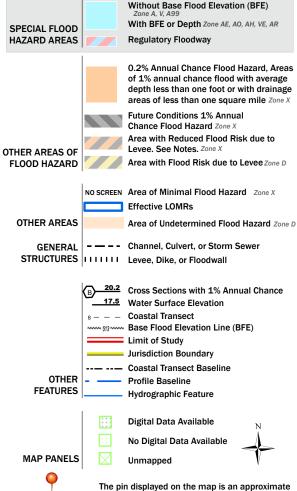


Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020



#### Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT



This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

point selected by the user and does not represent

an authoritative property location.

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 12/29/2022 at 12:31 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

# **Attachment 8**

## **Airport Clear Zones**

The Oceana County Airport is located southeast of the eastern portion of the project site. Based upon the nature of the project, the project will not impact the airport clear zone.



# **Attachment 9**

# Environmental Assessment

Village of Shelby Watermain Extension and Booster Station Project: Oceana County, Michigan

4/2/2021

Prepared by: Michigan Rural Community Assistance Partnership. This report has been made possible as a result of funding as part of the RCAP/Technitrain Program, an RCAP network project. GLCAP is an equal opportunity employer and provider.

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### 1.0 Purpose and Need of Project

### 1.1 Project Description

Village of Shelby is in Oceana County, Michigan. Just East of U.S. Highway 31 between the City of Muskegon to the south and the City of Ludington to the north.

#### 1.2 Purpose and Need of Project

The Project includes installing a 4.4-km-long (2.71-mi) water main extension from the Village of Shelby north into Shelby Township to Peterson Farms to connect nine apartment buildings to the Village of Shelby's water system. The water main extension will be in the right-of-way (ROW) but outside of the existing roadway. The project will also include a booster station near the intersection of West Weaver Road and 79th Avenue. Peterson Farms, which is north of the Village of Shelby, currently owns a total of nine apartment buildings that have been recently constructed. Three (3) apartment buildings are near the intersection of Oceana Drive and Baseline Road and six (6) apartment buildings are at the northeast corner of 88th Avenue and Baseline Road. Currently, the apartment buildings use water from wells that were drilled for each building. Peterson Farms is seeking to connect to the Village of Shelby's water system and abandon their existing private well system, eliminating the risk of potential contamination.

## 2.0 Alternatives to the Proposed Action

Table 1. List of Alternatives for the Supply and Treatment Systems.

Alternative	Beneficial Environmental	Potential Adverse
	Impacts	Environmental Impacts
Construct using only 8" watermain.	Does not meet the recommended fire flows.	None

Construct using only 12" watermain.	Exceeds the recommended fire flows.	None.
Construct using a combination of 12" and 8" watermain.	Comes close to meeting the desired fire flow.	None.

### 2.1 Alternative 1 - 8" only watermain option.

Alternative 1, which consist of all 8" watermain, does not meet the recommended fire flow of 1,000 gpm.

#### 2.2 Alternative 2 – 12" only watermain option.

Alternative 2, which consist of all 12" watermain, exceeds the recommended fire flow.

### 2.3 Alternative 3 - Combination of 12" and 8" watermain

Alternative 3, which consist of 12" watermain along Oceana Drive and 8" watermain along Baseline Road, come very close to meeting the desired fire flow. Therefore, since the only water demand along Baseline Drive is the Oceana Acres Development, sizing the watermain as 8-inch still provides adequate flow and is considered the selected alternative for the proposed project.

# $3.0 \quad Affected \, Environment/Environmental \, Consequences$

#### 3.1 Land Use/Important Farmland/Formally Classified Lands

#### 3.1.1 Affected Environment

The proposed project is to be built on previously disturbed lands including easements, road rights-of-ways, mowed ditches, and municipally owned lands. All watermains are to be constructed in the road rights-of-way and directionally bored where necessary. Previous ground disturbing activity has included the construction of roads, ditches, and excavation for utilities. Expansions are proposed in existing road rights-of-way. Previous ground disturbance at this site has included tree removal. A detailed Soil Resource Report was collected from the USDA NRCS website and can be found in Sections 7.8.1 & 7.8.2 of this document. This report showed that there were no designations of "Prime Farmland".

#### 3.1.2 Environmental Consequences

The proposed project will be within existing easements, road rights-of-ways, mowed ditches, and municipally owned lands. The project will not take place in any areas designated as "Prime Farmland"; no

environmental consequences are anticipated as a direct result of this project.

#### 3.1.3 Mitigation

No mitigation is necessary as no direct impact is anticipated regarding prime and important soils nor prime farmland with the proposed project.

#### 3.2 Floodplains

#### 3.2.1 Affected Environment

The project area has been mapped for the FEMA National Flood Insurance Program. According to the FIRM maps, components of the project including collection lines, manhole replacement and sewer line extension will be constructed out of the 100- or 500-year floodplain. The FEMA FIRM maps can be seen in Section 7.5. This project will have no effect on floodplains, furthermore, excavations will be below ground, and the ground returned to its original condition including restored topsoil, grass, and paving, etc.

#### 3.2.2 Environmental Consequences

No long-term environmental consequences associated with the floodplains are anticipated in association with the proposed project.

#### 3.2.3 Mitigation

No mitigation is necessary as no direct impact is anticipated regarding floodplains with the proposed project.

#### 3.3 Wetlands

#### 3.3.1 Affected Environment

The project area was mapped using the USFWS National Wetlands Inventory (NWI) data to determine if there were wetlands within the project area. According to the NWI data, this project will have no effect to any wetlands. Furthermore, excavations will be below ground, and the ground returned to its original condition including restored topsoil, grass, and paving, etc. The National Final Wetlands Inventory map is shown in Section 7.7.

#### 3.3.2 Environmental Consequences

No long-term environmental consequences associated with wetlands are anticipated with the proposed project.

#### 3.3.3 Mitigation

No mitigation will be required, as no significant adverse impacts exist. Any excavations will be below ground, and the ground returned to its original condition.

#### 3.4 Water Resources

#### 3.4.1 Affected Environment

The environment affected by the proposed project is within existing easements, road rights of ways, mowed ditches, and municipally owned lands.

#### 3.4.2 Environmental Consequences

This project should not have any negative impact on surface or ground water quality in the area because of the proposed actions. The proposed project should have a water quality benefit to the residents of Peterson Farms which is improving the health of the public. These proposed improvements will provide

the opportunity for the elimination of associated public health risks and environmental risks.

#### 3.4.3 Mitigation

No mitigation measures are necessary regarding water quality as no negative impacts are anticipated to result from the proposed project.

#### 3.5 Coastal Resources

#### 3.5.1 Affected Environment

Village of Shelby and the proposed project is not located within the Coastal Zone Management (CZM) Area. The project is in the existing road right-of-way. Therefore, no affect to coastal resources is anticipated with this project.

#### 3.5.2 Environmental Consequences

No environmental consequences or impacts are anticipated with this project regarding coastal resources.

#### 3.5.3 Mitigation

No mitigation will be required, as there are no environmental impacts anticipated regarding coastal resources.

#### 3.6 Biological Resources

#### 3.6.1 Affected Environment

No environmental consequences are anticipated to occur with the proposed sewer collection system and manhole replacement. The proposed project will be constructed within easements, road rights-of-ways, municipally owned lands. Within the Village of Shelby and Shelby Township there are known endangered and threatened species including: Northern Long-eared Bat, Indiana Bat, Eastern Massasauga Rattlesnake, Karner Blue Butterfly, Piping Plover, Red Knot, Whooping Crane, and Pitcher's Thistle. The U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) website was consulted to provide further information about the habitat in this area. According to USFWS IPaC site, there is no known candidate, threatened or endangered species and no known critical habitat or hibernacula within the project area. Please see the attached Species List and General Project Design Guidelines in Section 6 regarding habitat and threatened and endangered species surveys that have been conducted in this area. Below briefly describes each species' habitats and lists the likelihood of affect:

During the summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities or in crevices of both live trees and snags (dead trees). Northern long-eared bats spend winter hibernating in caves and mines, called hibernacula. Because no significant tree removal is anticipated, there will be no effect on the NLEB.

This project will be built on road rights-of-way and mowed ditches therefore there is no suitable habitat for the Piping Plover, Red Knot, Pitchers Thistle. Eastern Massasauga Rattlesnake is typically associated with open wetlands and lowland coniferous forests, such as cedar swamps. The project will not be taking place in any wetlands. According to the MNFI report, the project site is located outside of the Tier 1 and Tier 2 habitats for the Eastern Massasauga Rattlesnake.

The Eastern Prairie Fringed Orchid grows in a wide range of habitats from mesic prairie to wetlands such as sedge meadows, marsh edges, even bogs. The mowed ditches, easements, road rights-of-ways, and

mowed municipal property are not suitable habitat for the Eastern Prairie Fringed Orchid.

#### 3.6.2 Environmental Consequences

The components of the proposed project involve the construction and replacement of new infrastructure on existing easements and road rights-of-ways. The road rights-of-ways, mowed ditches, and the mowed municipal land are not biological habitat. Tree removals are not anticipated with this project. No environmental consequences are anticipated with regards to threatened or endangered species with this project.

#### 3.6.3 Mitigation

No mitigation is required as there are no anticipated effects to endangered species with this project.

#### 3.7 Historic and Cultural Resources

#### 3.7.1 Affected Environment

The land area impacted by the project is easements, road rights-of-ways, mowed ditches, and municipally owned lands. There are no historic sites listed in the National Register or sites identified within the Area of Potential Effect (APE).

#### 3.7.2 Environmental Consequences

The National Historic Preservation Act of 1966 requires a Section 106 review to determine any impacts upon historic properties and cultural resources. The State Historic Preservation Officer (SHPO) requires an archaeological consultant to review the project and conduct any necessary field work to ensure that no cultural or historic sites are affected by the project. The details of this project were reviewed by the archaeological consultant: Commonwealth Heritage Group, Inc. The archaeologist conducted a a literature review at the Michigan SHPO, compiling information regarding previously identified archaeological sites and surveys. They determined the project would have no effect on historic or cultural resources. The archaeological report was included within the Section 106 Application and sent in to SHPO, who then conducted their own review of the project. Upon SHPO's review, the State Historic Preservation Officer concurs with the determination of the USDA/RD that no Historic properties are affected within the area of potential effects of this undertaking. See State Historic Preservation Officer Response in Section 6.5. The National Historic Preservation Act also requires that the federal agencies consult with any Indian tribe and /or Tribal Historic Preservation Officer (THPO). The SHPO letter and determination was sent to the appropriate tribes and/or Tribal Historic Preservation Officers for their review and comments. The 106 Application, archaeological report, State Historic Preservation officer response, and Tribal Historic Preservation Officer responses can be seen in Section 6.

#### 3.7.3 Mitigation

No mitigation required as there are no anticipated effects to cultural and historic resources.

#### 3.8 Aesthetics

#### 3.8.1 Affected Environment

The proposed project will be constructed within easements, road rights-of-way, and municipally owned lands. There are no visually sensitive areas or landscape features within the area of the proposed project.

All areas have been previously developed for either municipal or commercial use.

#### 3.8.2 Environmental Consequences

The construction may have a temporary impact on the aesthetics of the area; however, any excavations will be below ground, and the ground returned to its original condition including restored topsoil, grass, paving, etc.

#### 3.8.3 Mitigation

No mitigation is required with respect to aesthetics.

### 3.9 Air Quality

#### 3.9.1 Affected Environment

Air quality in Village of Shelby and Shelby Township is generally good. The proposed project is not anticipated to increase in any emissions after construction. Oceana County is outside of the Nonattainment areas for both ozone and sulfur dioxide (See Section 7.8).

#### 3.9.2 Environmental Consequences

During construction, there will be short term air quality impacts from fugitive dust as is common with any construction project; however, these impacts will be mitigated using best management practices during construction, such as dampening of the soil to limit dust and use of diesel-powered equipment that will be fueled with low sulfur diesel fuel. Additionally, contractors will be encouraged to limit idling time during operation of heavy equipment to reduce air quality impacts from exhaust.

The National Ambient Air Quality Standards (NAAQS) are health-based pollution standards set by EPA. Areas of the state that are above the NAAQS concentration level are called nonattainment areas. For large increases in emissions requiring permitting, companies in nonattainment areas must meet additional requirements, including the requirement to get offsets. Huron County is NOT located within a nonattainment area for ozone or sulfur dioxide and will not be producing long term air quality impacts, therefore, this project will not require offsets or any other mitigation measures.

#### 3.9.3 Mitigation

No mitigation measures are necessary regarding impacts to air quality as there will be no long-lasting impacts to the air quality in the area resulting from this project.

#### 3.10 Socio-Economic Impact Assessment/Environmental Justice Issues

#### 3.10.1 Affected Environment

According to the American Community Survey 2019, there were 2,427 people living in the Village of Shelby, the Census Designated Place within Shelby Township that the project lies within. There were 792 households, and 573 families residing in the Village of Shelby. The racial makeup was 91.7% White, 1.5% African American, 1.2% Native American, 0.2% Asian, and 2.5% from other races, and Hispanic or Latino of any race made up 2.8% of the population.

There were 792 households out of which 63.4% had children under the age of 18 living with them, 48.3% were married couples living together, 19.8% had a female householder with no husband present, and 27.6% were non-families. Of all households, 23.6% were made up of individuals and 8.7% had someone

who was 65 years of age or older. The average household size was 3.06. The Village of Shelby has a population range that consists of 36.0% under the age of 18, and 14.7% who were 65 years of age or older. The median age was 30.3 years. According to the American Community Survey 2019, the median income for a household in the Village of Shelby was \$43,511, and the median family income was \$67,833. Individuals and families below the poverty line made up 23.3% of the population, respectively. Out of the total people living in poverty, 34.2% are under the age of 18 and 12.1% are 65 or older.

The Drinking water distribution system improvements for The Village of Shelby (Shelby Township) will serve all the residents. The customers are to be charged fairly and equitably according to their usage of the system. The planned improvements in association with this project will benefit all residents within The Village of Shelby equally. The cost of the project will be distributed across all users, through user rates. No segment of the population will be treated differently than any other, and discrimination within the Village of Shelby is prohibited.

#### 3.10.2 Environmental Consequences

No environmental consequences are anticipated regarding socio- economic/ environmental justice issues relating to this project. All residents and users of the system will be treated equally, and all will share equally in the benefits and cost of the improvements proposed.

#### 3.10.3 Mitigation

No mitigation measures are necessary as no socio-economic/environmental justice impacts are anticipated in relation to this project.

#### 3.11 Miscellaneous Issues

#### 3.11.1 Noise

#### 3.11.1.1 Affected Environment

The Village of Shelby and Shelby Township is a rural residential community in the proposed project. Major sources of noise in the area are traffic related to local activities.

#### 3.11.1.2 Environmental Consequences

No new sound generating equipment is anticipated in the proposed project. However, during construction, noise levels will increase due to the construction activities and heavy equipment use. The use of best management practices should limit the unnecessary noise from construction by limiting idling time of heavy equipment, and unnecessary noise from construction workers during construction. Construction will be limited to normal daylight hours as well, which will limit the disruption of the normal quiet nature of the community.

#### *3.11.1.3 Mitigation*

No mitigation measures are necessary in association with noise control related to this project as no long-term impacts are anticipated.

#### 3.11.2 Transportation

#### 3.11.2.1 Affected Environment

The areas of construction for this project have the potential to disrupt the normal flow of traffic along Cliff

Rd. Local transportation may be temporarily affected on this street by construction, employee, and equipment traffic.

#### 3.11.2.2 Environmental Consequences

The project will have a temporary effect on local transportation due to construction in the road rights- of-ways and construction equipment using these roads to gain access to the construction sites, which is expected to disrupt normal traffic flow. This project is not anticipated to have any lasting impacts on transportation patterns. If street closures or detours are necessary, these will be coordinated with the Michigan Department of Transportation, the local street department and/or the County Road Commission. These should be highly publicized and well-marked during construction.

#### 3.11.2.3 Mitigation

No mitigation measures are necessary in relation to the proposed project regarding transportation, as no long-term impacts are anticipated.

#### 3.11.3 Solid Waste Disposal

#### 3.11.3.1 Affected Environment

Solid waste disposal will not be impacted by this project. During construction, construction crews should be responsible for cleanup of debris daily, as well as at the end of the construction during the cleanup and restoration phases. There are no new permanent sources of solid waste materials associated with this project.

#### 3.11.3.2 Environmental Consequences

No environmental consequences are anticipated because of this project. Solid waste generated by the project will be managed in an appropriate manner as required in the construction agreements. The general contractor will be responsible for adequate and appropriate disposal of all wastes generated during construction. No long-term impact on solid waste is anticipated, other than those that will be subject to permitting processes currently in place locally or statewide.

#### **3.11.3.3** *Mitiaation*

No mitigation measures are necessary as no impacts are anticipated to result from the proposed project.

### 3.12 Health and Human Safety

#### 3.12.1 Electromagnetic fields and interference

#### 3.12.1.1 Affected Environment

This project will not include any equipment that produces any significant electromagnetic fields.

#### 3.12.1.2 Environmental Consequences

No environmental consequences are anticipated regarding electronic fields.

#### *3.12.1.3 Mitigation*

No mitigation measures are necessary as no impacts are anticipated to result from the proposed project.

#### 3.12.2 Environmental Management

#### 3.12.2.1 Affected Environment

EGLE STD (Storage Tank Division) enforces state and federal laws regarding pollution from storage tank leaks or releases and maintains a listing of all known releases of hazardous materials from any registered

underground or above ground storage tanks. There are no known releases in the proposed construction area.

#### 3.12.2.2 Environmental Consequences

A search of the EGLE/STD website showed no open or closed underground storage tank locations in or near the proposed construction site. See section 7.9 for a map of known active and closed storage tanks in the vicinity of the project.

Part 213 of the Natural Resources Environmental Protection Act (NREPA) prohibits any exacerbation of any polluted areas (e.g. through excavation and/or dewatering activities). The consultants and contractors will take all necessary precautions when working in potentially contaminated areas.

If, during construction, the contractor encounters any contaminated soil which appears to be the result of an unreported release of hazardous material, the contractor will immediately cease construction and notify the municipal entity, who in turn will notify the EGLE STD of a suspected release. According to law, a discovery of a suspected release of hazardous materials must be reported to EGLE STD within 24 hours. This begins a series of mitigation efforts and/or enforcement actions. These measures are designed to protect the public from any environmental consequences from hazardous spills.

#### *3.12.2.3 Mitigation*

No mitigation measures are necessary as no impacts are anticipated to result from the proposed project.

### 3.13 Corridor Analysis

#### 3.13.1 Affected Environment

The proposed project will be constructed within easements, road rights of ways, and municipally owned lands. There are no visually sensitive areas or landscape features within the area of the proposed project.

#### 3.13.2 Mitigation

No mitigation required for the proposed project.

#### 4.0 Cumulative Effects

No negative long term environmental impacts are anticipated regarding the Village of Shelby and Shelby Township watermain improvements and extension project. The project will improve the water quality by eliminating the need for individual building well systems. When this project is completed. It will ensure the health of these ecosystems and the residents who utilize them.

# 5.0 Summary of Mitigation

No mitigation measures are necessary in relation to this project as no long-term negative impacts are anticipated to result from the proposed actions.

## 6.0 Coordination, Consultation, and Correspondence

- **6.1** Fish and Wildlife Service Review and Section 7 Endangered Species Act Consultation
- 6.2 U.S. Fish and Wildlife Service General Project Guidelines



# United States Department of the Interior



#### FISH AND WILDLIFE SERVICE

Michigan Ecological Services Field Office 2651 Coolidge Road Suite 101 East Lansing, MI 48823-6360 Phone: (517) 351-2555 Fax: (517) 351-1443

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In Reply Refer To: July 06, 2021

Consultation Code: 03E16000-2021-SLI-1808

Event Code: 03E16000-2021-E-06584 Project Name: Village of Shelby, MI

Subject: List of threatened and endangered species that may occur in your proposed project

location or may be affected by your proposed project

#### To Whom It May Concern:

The attached species list identifies any federally threatened, endangered, proposed and candidate species that may occur within the boundary of your proposed project or may be affected by your proposed project. The list also includes designated critical habitat if present within your proposed project area or affected by your project. This list is provided to you as the initial step of the consultation process required under section 7(c) of the Endangered Species Act, also referred to as Section 7 Consultation.

Section 7 of the Endangered Species Act of 1973 requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representative) must consult with the Fish and Wildlife Service if they determine their project may affect listed species or critical habitat.

There are several important steps in evaluating the effects of a project on listed species. Please use the species list provided and visit the U.S. Fish and Wildlife Service's Region 3 Section 7 Technical Assistance website at <a href="http://www.fws.gov/midwest/endangered/section7/s7process/index.html">http://www.fws.gov/midwest/endangered/section7/s7process/index.html</a>. This website contains step-by-step instructions to help you determine if your project may affect listed species and lead you through the section 7 consultation process.

Under 50 CFR 402.12(e) (the regulations that implement section 7 of the Endangered Species Act), the accuracy of this species list should be verified after 90 days. You may verify the list by visiting the ECOS-IPaC website (<a href="http://ecos.fws.gov/ipac/">http://ecos.fws.gov/ipac/</a>) at regular intervals during project planning and implementation and completing the same process you used to receive the attached list.

For all wind energy projects and projects that include installing towers that use guy wires or are over 200 feet in height, please contact this field office directly for assistance, even if no federally listed plants, animals or critical habitat are present within your proposed project area or may be affected by your proposed project.

Please see the "Migratory Birds" section below for important information regarding incorporating migratory birds into your project planning. Our Migratory Bird Program has developed recommendations, best practices, and other tools to help project proponents voluntarily reduce impacts to birds and their habitats. The Bald and Golden Eagle Protection Act prohibitions include the take and disturbance of eagles. If your project is near an eagle nest or winter roost area, see our Eagle Permits website at <a href="https://www.fws.gov/midwest/eagle/permits/index.html">https://www.fws.gov/midwest/eagle/permits/index.html</a> to help you avoid impacting eagles or determine if a permit may be necessary.

Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <a href="https://www.fws.gov/birds/policies-and-regulations/administrative-orders/executive-orders.php">https://www.fws.gov/birds/policies-and-regulations/administrative-orders/executive-orders.php</a>.

We appreciate your concern for threatened and endangered species. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

#### Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

# **Official Species List**

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Michigan Ecological Services Field Office 2651 Coolidge Road Suite 101 East Lansing, MI 48823-6360 (517) 351-2555

### **Project Summary**

Consultation Code: 03E16000-2021-SLI-1808 Event Code: 03E16000-2021-E-06584 Project Name: Village of Shelby, MI

Project Type: WATER SUPPLY / DELIVERY

Project Description: Watermain and water booster station project

Project Location:

Approximate location of the project can be viewed in Google Maps: <a href="https://www.google.com/maps/@43.6256999999995">https://www.google.com/maps/@43.62569999999995</a>,-86.35755836549956,14z



Counties: Oceana County, Michigan

### **Endangered Species Act Species**

There is a total of 8 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Note that 2 of these species should be considered only under certain conditions.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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.

#### **Mammals**

NAME STATUS

#### Indiana Bat *Myotis sodalis*

Endangered

There is **final** critical habitat for this species. The location of the critical habitat is not available.

Species profile: https://ecos.fws.gov/ecp/species/5949

General project design guidelines:

https://ecos.fws.gov/docs/tess/ipac\_project\_design\_guidelines/doc5663.pdf

#### Northern Long-eared Bat Myotis septentrionalis

Threatened

No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a>

General project design guidelines:

https://ecos.fws.gov/docs/tess/ipac\_project\_design\_guidelines/doc5664.pdf

#### **Birds**

NAME STATUS

#### Piping Plover Charadrius melodus

Endangered

 $Population: [Great\ Lakes\ watershed\ DPS]\ -\ Great\ Lakes,\ watershed\ in\ States\ of\ IL,\ IN,\ MI,\ MN,$ 

NY, OH, PA, and WI and Canada (Ont.)

There is **final** critical habitat for this species. The location of the critical habitat is not available.

Species profile: https://ecos.fws.gov/ecp/species/6039

#### Red Knot Calidris canutus rufa

Threatened

No critical habitat has been designated for this species.

This species only needs to be considered under the following conditions:

 Only actions that occur along coastal areas during the Red Knot migratory window of MAY 1 - SEPTEMBER 30.

Species profile: <a href="https://ecos.fws.gov/ecp/species/1864">https://ecos.fws.gov/ecp/species/1864</a>

#### Whooping Crane Grus americana

Population: U.S.A. (AL, AR, CO, FL, GA, ID, IL, IN, IA, KY, LA, MI, MN, MS, MO, NC, NM, OH, SC, TN, UT, VA, WI, WV, western half of WY)

No critical habitat has been designated for this species.

Species profile: <a href="https://ecos.fws.gov/ecp/species/758">https://ecos.fws.gov/ecp/species/758</a>

Tincutched

Experimental Population, Non-Essential

#### **Reptiles**

NAME STATUS

#### Eastern Massasauga (=rattlesnake) Sistrurus catenatus

No critical habitat has been designated for this species.

This species only needs to be considered under the following conditions:

For all Projects: Project is within EMR Range

Species profile: <a href="https://ecos.fws.gov/ecp/species/2202">https://ecos.fws.gov/ecp/species/2202</a>

General project design guidelines:

https://ecos.fws.gov/docs/tess/ipac\_project\_design\_guidelines/doc5280.pdf

Threatened

#### **Insects**

NAME STATUS

#### Karner Blue Butterfly Lycaeides melissa samuelis

Endangered

There is **proposed** critical habitat for this species. The location of the critical habitat is not available.

Species profile: https://ecos.fws.gov/ecp/species/6656

### **Flowering Plants**

NAME STATUS

#### Pitcher's Thistle Cirsium pitcheri

Threatened

No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/8153">https://ecos.fws.gov/ecp/species/8153</a>

### **Critical habitats**

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

# USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the <u>National Wildlife Refuge</u> 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 OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

DDEEDING

## **Migratory Birds**

Certain birds are protected under the Migratory Bird Treaty Act<sup>1</sup> and the Bald and Golden Eagle Protection Act<sup>2</sup>.

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 <u>below</u>.

- 1. The Migratory Birds Treaty Act of 1918.
- 2. The Bald and Golden Eagle Protection Act of 1940.
- 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the <a href="USFWS">USFWS</a>
Birds of Conservation Concern</a> (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 <a href="below">below</a>. 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 <a href="E-bird data">E-bird data</a>
<a href="mapping tool">mapping tool</a> (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	SEASON
American Golden-plover <i>Pluvialis dominica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Bald Eagle <i>Haliaeetus leucocephalus</i> 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. <a href="https://ecos.fws.gov/ecp/species/1626">https://ecos.fws.gov/ecp/species/1626</a>	Breeds Dec 1 to Aug 31

NAME	BREEDING SEASON
Lesser Yellowlegs <i>Tringa flavipes</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. <a href="https://ecos.fws.gov/ecp/species/9679">https://ecos.fws.gov/ecp/species/9679</a>	Breeds elsewhere
Semipalmated Sandpiper <i>Calidris pusilla</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Wood Thrush <i>Hylocichla mustelina</i> 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.

#### **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 (|)

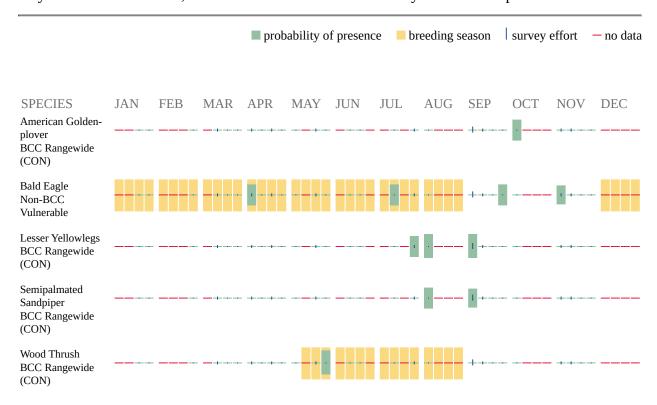
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

#### 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.



Additional information can be found using the following links:

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

Nationwide conservation measures for birds <a href="http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf">http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf</a>

#### **Migratory Birds FAQ**

# 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 <u>Birds of Conservation Concern</u> (<u>BCC</u>) 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 <u>Avian Knowledge Network (AKN)</u>. The AKN data is based on a growing collection of <u>survey</u>, <u>banding</u>, <u>and citizen science datasets</u> 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 (<u>Eagle Act</u> 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 <u>AKN Phenology Tool</u>.

# 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 <u>Avian Knowledge Network (AKN)</u>. This data is derived from a growing collection of <u>survey</u>, <u>banding</u>, <u>and citizen science datasets</u>.

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 <u>Birds of Conservation Concern</u> (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 <a href="Eagle Act">Eagle Act</a> 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 <a href="Northeast Ocean Data Portal">Northeast Ocean Data Portal</a>. 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 <a href="NOAA NCCOS Integrative Statistical Modeling">NOAA NCCOS Integrative Statistical Modeling</a> and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic <a href="Outer Continental Shelf">Outer Continental Shelf</a> 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 <u>Diving Bird Study</u> and the <u>nanotag studies</u> or contact <u>Caleb Spiegel</u> or <u>Pam Loring</u>.

#### What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to <u>obtain a permit</u> 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.

## **Wetlands**

Impacts to <u>NWI wetlands</u> 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>U.S. Army Corps of Engineers District</u>.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER FORESTED/SHRUB WETLAND

PSS1C

# General Project Design Guidelines (3 Species)

Generated July 06, 2021 11:45 AM MDT, IPaC v5.61.0



IPaC - Information for Planning and Consultation (https://ecos.fws.gov/ipac/): A project planning tool to help streamline the U.S. Fish and Wildlife Service environmental review process.

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# Species Document Availability

### Species with general design guidelines

Eastern Massasauga (=rattlesnake) Sistrurus catenatus

Indiana Bat Myotis sodalis

Northern Long-eared Bat Myotis septentrionalis

### Species without general design guidelines available

Karner Blue Butterfly Lycaeides melissa samuelis

Piping Plover Charadrius melodus

Pitcher's Thistle Cirsium pitcheri

Red Knot Calidris canutus rufa

Whooping Crane Grus americana

# General Project Design Guidelines - Indiana Bat and 7 more species

Published by Michigan Ecological Services Field Office for the following species included in your project

Indiana Bat Myotis sodalis

Piping Plover Charadrius melodus

Karner Blue Butterfly Lycaeides melissa samuelis

Pitcher's Thistle Cirsium pitcheri Red Knot Calidris canutus rufa Whooping Crane Grus americana

Eastern Massasauga (=rattlesnake) Sistrurus catenatus

Northern Long-eared Bat Myotis septentrionalis

# Indiana Bat Project Review in Michigan

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#### I. BACKGROUND INFORMATION

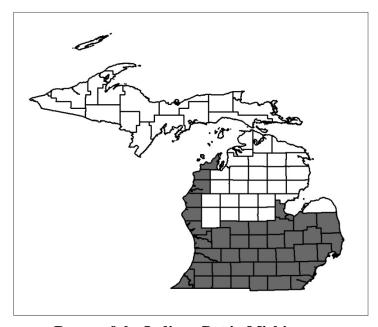
The Indiana bat was listed as endangered under the Endangered Species Act (ESA) in 1967 due to episodes of people disturbing hibernating bats in caves during winter, which resulted in the death of substantial numbers of bats. Indiana bats are vulnerable to disturbance because they hibernate in large numbers in only a few sites, with major hibernacula supporting 20,000 to 50,000 bats. Since it was listed as endangered, the range-wide Indiana bat population has declined by nearly 60%. Several threats are believed to have contributed to the Indiana bat's decline, including the commercialization of caves, loss and degradation of forested habitat, pesticides and other contaminants, and most recently, the disease white-nose syndrome (WNS).

#### **Indiana Bat in Michigan**

Indiana bats have been documented at many sites in Lower Michigan and are believed to range throughout the southern five county tiers, as well as parts of the thumb and the western coastal counties up to (and including) the Leelanau peninsula (see range map below). Michigan is home to a single known Indiana bat hibernaculum: a hydroelectric dam in Manistee County. Although the dam supports about 20,000 hibernating bats, Indiana bats comprise less than 1% of the winter population. Research suggests that the majority of the Indiana bats that summer in Michigan migrate to hibernacula in adjacent states, such as Indiana and Kentucky.

Like their overwintering sites, Indiana bats exhibit strong fidelity to their summer home ranges; however, we do not have knowledge of all of these summering areas in Michigan. Therefore, unless presence/absence surveys conducted in accordance with U.S. Fish and Wildlife Service (Service) guidelines

(https://www.fws.gov/MIDWEST/Endangered/mammals/inba/inbasummersurveyguidance.html, and also available via IPaC) indicate the probable absence of the species, Indiana bats are considered potentially present wherever suitable habitat exists within their range.



Range of the Indiana Bat in Michigan

#### Suitable Habitat for Indiana Bats:

During the winter, Indiana bats hibernate in caves, mines, or similar structures. Most major hibernacula for the species are found in Illinois, Indiana, Kentucky, Missouri, Tennessee, and West Virginia, and critical (winter) habitat has been designated in these states. Michigan is home to a single known Indiana bat hibernaculum, in Manistee County, and there is no designated critical habitat for the species in Michigan.

Suitable summer habitat for Indiana bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats, such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥5 inches dbh that have exfoliating bark or cracks/crevices), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure.

Individual trees may be considered suitable habitat when they exhibit characteristics of suitable roost trees and are within 1000 feet of other forested/wooded habitat. Southern Michigan maternity roost trees are typically dead or dying trees in open areas exposed to solar radiation. Infrequently, Indiana bats are observed roosting in human-made structures, such as buildings, barns, bridges, and bat boxes.

#### II. VOLUNTARY CONSERVATION MEASURES

Voluntary conservation measures that benefit the Indiana bat include protecting, creating, and enhancing mature forest, particularly hardwood/mixedwood stands containing standing snags, dying trees, vertical complexity, midstory/understory flight space, and waterbodies such as streams, ponds, and forested wetlands. As Indiana bats are known to avoid traversing large open areas outside of migration, preserving wooded corridors (such as tree lines) can be extremely beneficial in connecting fragmented patches of suitable roosting/foraging habitat.

Conserving Indiana bat habitat likely benefits the Federally threatened northern long-eared bat (*Myotis septentrionalis*) and other native bat species, several of which are experiencing recent population declines as a result of WNS and/or other factors. As significant predators of nocturnal insects, including many crop and forest pests, bats are important to Michigan's agriculture and forests. For example, Whitaker (1995)<sup>1</sup> estimated that a single colony of 150 big brown bats (*Eptesicus fuscus*) would eat nearly 1.3 million pest insects each year. Boyles et al. (2011)<sup>2</sup> noted that the "loss of bats in North America could lead to agricultural losses estimated at more than \$3.7 billion/year," and using their data for Michigan alone, we totaled the estimated value at over \$500 million per year (assuming standard crop pest survival). Taking proactive

<sup>&</sup>lt;sup>1</sup> Whitaker, J.O. 1995. Food of the Big Brown Bat *Eptesicus fuscus* from Maternity Colonies in Indiana and Illinois. American Midland Naturalist 134(2):346-360.

<sup>&</sup>lt;sup>2</sup> Boyles, J.G., P.M. Cryan, G.F. McCracken, and T.H. Kunz. 2011. Economic Importance of Bats in Agriculture. Science 332:41-42.

steps to help protect bats may be valuable to agricultural and timber producer yields and pest management costs.

Continue to the following sections for ESA guidance on Federal and non-Federal projects in Michigan. For more information on the Indiana bat, including life history information, designated critical habitat and draft recovery plan, please visit: https://www.fws.gov/midWest/endangered/mammals/inba/

#### III. ESA GUIDANCE: PRIVATE LANDOWNERS/NON-FEDERAL PROJECTS

The Service does not require private landowners to conduct surveys for ESA-listed bats on their lands in Michigan. However, the bats and the habitats where they are known to occur are protected by the ESA. Under Section 9 of the ESA, it is unlawful for any person to "take" an endangered species. The term "take" is defined as, "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." "Harm" is further defined to include "significant habitat modification or degradation where it actually kills or injures wildlife by significantly impacting essential behavioral patterns, including breeding, feeding, or sheltering."

In general, activities that impact suitable Indiana bat habitat have the potential to result in take. One of the most common activities impacting Indiana bat habitat is tree clearing during the summer season. Typically, incidental take associated with tree removal (i.e., trimming, cutting, girdling, burning) can be avoided by scheduling these activities during the winter hibernation period (October 1 through March 31), when Indiana bats have departed from summer habitat. As long as the scope of winter tree removal, in terms of acres, is not significant enough to constitute "harm," effects to Indiana bats can be kept minimal or beneficial.

Permits and authorizations are required whenever incidental take of Indiana bats is reasonably certain to occur. If your project is likely to result in the take of Indiana bats, please contact the Michigan Ecological Services Field Office to determine if a permit pursuant to the ESA is warranted. For general information about take permits, visit: <a href="https://www.fws.gov/Midwest/endangered/permits/index.html">https://www.fws.gov/Midwest/endangered/permits/index.html</a>.

As a means to determine the likelihood of take, project proponents may be interested in documenting whether potential habitat is, in fact, occupied by Indiana bats. In such cases, presence/absence surveys conducted in accordance with current Service guidelines (<a href="https://www.fws.gov/MIDWEST/Endangered/mammals/inba/inbasummersurveyguidance.html">https://www.fws.gov/MIDWEST/Endangered/mammals/inba/inbasummersurveyguidance.html</a> and also available via IPaC) can inform project-specific conservation measures and the need for a permit.

Please note that projects that require State permits or authorizations that implement Federal laws or are supported by Federal funds (e.g., Clean Water Act, transportation projects) may have additional requirements under or similar to Section 7 of the ESA, as described in the following section: IV. ESA GUIDANCE: FEDERAL PROJECTS.

#### IV. ESA GUIDANCE: FEDERAL PROJECTS

#### 1. Standard Section 7 Consultation:

Under the ESA, requirements for Federal projects (i.e., projects funded, authorized, permitted, or implemented by a Federal agency) are different than requirements for wholly private or otherwise non-Federal projects. The ESA mandates all Federal departments and agencies to conserve listed species and to utilize their authorities in furtherance of the purposes of the ESA. Section 7 of the ESA, called "Interagency Cooperation," is the mechanism by which Federal agencies ensure the actions they conduct, including those they fund or authorize, do not jeopardize the existence of any listed species.

Federal agencies must request a list of species and designated critical habitat that may be present in the project area from the Service (i.e., via IPaC, on our website at <a href="https://www.fws.gov/midwest/Endangered/section7/sppranges/MIs7listrequest.html">https://www.fws.gov/midwest/Endangered/section7/sppranges/MIs7listrequest.html</a>, or by contacting our office). Then they must determine whether their actions may affect those species or critical habitat. If a listed species or critical habitat may be affected, consultation with the Service is required.

Please note that Section 7 or similar obligations may also apply to State permits or authorizations that implement Federal laws or projects that are supported by Federal funds (e.g., Clean Water Act, transportation projects).

For general guidance on Section 7 obligations for Federal projects, and step-by-step instructions on the process, visit: https://www.fws.gov/midwest/Endangered/section7/s7process/index.html.

# 2. Range-wide Programmatic Consultation for Indiana Bat and Northern Long-eared Bat (optional for Federal transportation projects that may affect Indiana Bats):

The U.S. Fish and Wildlife Service and Federal Highway Administration (FHWA) have standardized their approach to assessing impacts to Indiana bats and northern long-eared bats (NLEB) from highway construction and expansion projects; then avoiding, minimizing and mitigating those impacts. This landscape-level conservation strategy encompasses the ranges of both bat species and provides transparency and predictability to FHWA and state Departments of Transportation (DOTs) through proactive planning. Information provided by this consultation and conservation strategy allows transportation agencies to strategically avoid projects in high impact or high-risk areas for the Indiana bat and NLEB. For projects that cannot avoid impacts, project proponents receive information on ways to minimize impacts and preclude the need to revise projects later in their development. For large-scale projects or projects with greater impacts, priority conservation areas may be identified to offset and minimize the impacts of the take. This approach is intended to increase the consistency of both project design and review, reduce consultation process timeframes and delays, and contribute meaningfully to the conservation of both species.

Please note that use of the Range-wide Programmatic Consultation for Indiana Bat and NLEB is optional for Federal transportation projects, and transportation agencies may choose to follow standard section 7 procedures instead. For more information on the Range-wide Programmatic Consultation for Indiana Bat and NLEB, including User Guide and Project Submittal Form documents, visit:

https://www.fws.gov/Midwest/endangered/section7/fhwa/index.html

#### V. MICHIGAN ECOLOGICAL SERVICES FIELD OFFICE CONTACT INFORMATION

Please contact the Michigan Ecological Services Field Office for more information on potential impacts to listed bats as a result of any projects occurring in Michigan.

U.S. Fish and Wildlife Service Michigan Ecological Services Field Office 2651 Coolidge Road, Suite 101 East Lansing, MI 48823 Phone: 517-351-2555

Fax: 517-351-1443

TTY: 1-800-877-8339 (Federal Relay)

e-mail: EastLansing@fws.gov

# General Project Design Guidelines - Indiana Bat and 7 more species

Published by Michigan Ecological Services Field Office for the following species included in your project

Indiana Bat Myotis sodalis

Piping Plover Charadrius melodus

Karner Blue Butterfly Lycaeides melissa samuelis

Pitcher's Thistle Cirsium pitcheri Red Knot Calidris canutus rufa Whooping Crane Grus americana

Eastern Massasauga (=rattlesnake) Sistrurus catenatus

Northern Long-eared Bat Myotis septentrionalis

## Environmental Screening for Eastern Massasauga Rattlesnake in Michigan March 14, 2017

#### **Background**

The Eastern Massasauga Rattlesnake (EMR) is listed as a threatened species under the U.S. Endangered Species Act (Act). The Act protects the EMR and their habitat by prohibiting "take" and may require agencies to coordinate with the U.S. Fish and Wildlife Service (Service) before authorizing or funding an activity affecting the species. To streamline coordination, the Service's Michigan Ecological Services Field Office has developed a set of Best Management Practices (BMPs) for specific activities potentially impacting EMR in Michigan. These BMPs are voluntary and just one of the ways that compliance with the Act may be achieved.

#### Projects may...

- have no effect to EMR and no need for additional ESA compliance considerations.
- have potential for adverse effects, but use BMPs to avoid adverse effects (i.e., "not likely to adversely affect" EMR) or minimize the adverse effects.
- use surveys to confirm probable absence of EMR (contact the Service for survey guidance).
- use "Informal Consultation" with Service (for actions requiring a Federal permit or funding).
- use "Formal Consultation" with Service (for actions requiring a Federal permit or funding).
- develop a Habitat Conservation Plan and seek an ESA permit, if adverse effects cannot be avoided.

For activities not listed in the BMPs, please contact the Service for project-specific recommendations. In some cases implementation of BMPs may not be sufficient to avoid all adverse impacts to EMR and additional consultation with the Service may be required. The Service can assist planners in determining whether adverse effects are likely as a result of proposed projects, and whether implementation of BMPs is sufficient to remove the risk of adverse effects.

Additional information on compliance with the Act can be found:

For Federal actions/section 7 consultation:

https://www.fws.gov/midwest/Endangered/section7/s7process/index.html

For non-Federal actions:

https://www.fws.gov/midwest/endangered/permits/index.html

Michigan Ecological Services Field Office General Project Design Guidelines - Indiana Bat and 7 more species

For questions or comments you may contact the Service below:

U.S. Fish and Wildlife Service Michigan Ecological Services Field Office 2651 Coolidge Road, Suite 101 East Lansing, MI 48823

Phone: (517)351-2555

Email: <a href="mailto:eastlansing@fws.gov">eastlansing@fws.gov</a>

#### **Definitions**

Active Season: The active season begins in the spring when snakes emerge from hibernation, generally when maximum air temperatures are above 50°F, and ends in the fall when EMR have returned to their hibernacula and temperatures are consistently below 45°F. In Michigan, the active season is generally April through October. The active season dates will vary by location and weather. Contact the Service for project-specific dates based on location when work in EMR habitat is planned near the start or end of the active season.

Affecting hydrology: We consider "affecting hydrology" to include projects that are likely to appreciably change the elevations of surface water upstream or downstream, or in the local ground water (as estimated pre-project vs. post-project). The concern is for changes to local hydrology (e.g., creating new ditches, creating a new impoundment) that might harm EMR hibernating at or near ground water, or actions that significantly alter available suitable habitat either through flooding or drying of EMR wetlands.

Hibernacula: Areas suitable for EMR to overwinter. For most EMR populations, the locations of hibernacula are not known, but these areas are critical to protect. Unfortunately, we lack information on how to reliably identify these areas. EMR usually hibernate below the frost line in crayfish or small mammal burrows, tree root networks or rock cervices in or along the edge of wetlands or in adjacent upland areas with presumably high water tables (areas where the soil is saturated but not inundated). Following egress from hibernacula in the spring, EMR typically remain aboveground in the vicinity for a week or two, and return to these areas in the fall for several weeks prior to entering hibernation. Surveys in the spring (shorting following egress) or fall (prior to ingress) when snakes are congregating in the vicinity may help identify these important areas. Maintaining stable hydrology of these areas is important during the inactive season.

**IPaC:** "Information for Planning and Conservation" is a project planning tool available on-line to the public that streamlines the Service's environmental review process.

EMR Habitat: "Eastern Massasaugas have been found in a variety of wetland habitats. Populations in southern Michigan are typically associated with open wetlands, particularly prairie fens, while those in northern Michigan are known from open wetlands and lowland coniferous forests, such as cedar swamps. Some populations of Eastern Massasaugas also utilize open uplands and/or forest openings for foraging, basking, gestation and parturition (i.e., giving birth to young). Massasauga habitats generally appear to be characterized by the following: (1) open, sunny areas intermixed with shaded areas, presumably for thermoregulation; (2) presence of the water table near the surface for hibernation; and (3) variable elevations between adjoining lowland and upland habitats." From Michigan Natural Features Inventory (Website: mnfi.anr.msu.edu)

**Tier 1 Habitat:** Areas known to be occupied by EMR or highly likely to be occupied by EMR.

Tier 2 Habitat: Areas with high potential habitat and may be occupied by EMR.

Within the known range: EMR can occur throughout the Lower Peninsula and on Bois Blanc Island in Mackinac County. Areas within the known range but outside of Tier 1 and Tier 2 are considered less likely to be occupied. EMR is highly secretive and cryptic in nature, and can persist in low densities, which makes them difficult to detect. Further, there are extensive areas of the state that have never been surveyed. It is likely that there are additional and yet-unknown occurrences throughout the Lower Peninsula of Michigan. Mapped habitats are subject to change based on new information identifying current Tier 1 and 2 areas as unsuitable, or based on discovery of new EMR occurrences.

#### **EMR Environmental Screening Step-wise Process**

#### Step 1. Determine if EMR may be present in the action area

- ✓ Determine whether the project is in potential EMR habitat using <a href="https://ecos.fws.gov/ipac">https://ecos.fws.gov/ipac</a>
  - You can search for your project location and define the action area by drawing a polygon or uploading a shapefile.
  - o IPaC will give you a list of species that may be present in the area you identified. If you click on the thumbnail for EMR, it will tell you if your project is within Tier 1 or Tier 2 habitat, or within the known range of EMR. If EMR is not listed, you do not need to consider this species. Effects to other listed species should also be considered; contact the Service if you need assistance.
  - o If EMR is listed, it does not necessarily mean that the entire action area is potential habitat, only that some potential habitat is within the action area entered. For large-scale (e.g., county-wide or multi-county projects) consider coordinating the Michigan Ecological Services Field Office for direct assistance.

If your project is within the known range of EMR, including Tier 1 or Tier 2 habitat, continue to step 2:

#### Step 2. Determine if the project has the potential to affect EMR

#### Projects have no effect on EMR when...

- ✓ There is no suitable EMR habitat in the project area and no potential impact off-site (e.g., water discharge into adjacent EMR habitat). If project site conditions are determined to be wholly unsuitable for EMR (e.g., project is in regularly mowed turf grass, row crop, graveled lot, existing building, or industrial site), it is not suitable EMR habitat.
- ✓ The project occurs within suitable habitat, but the action will have absolutely no effect on the habitat or EMR.
- ✓ In suitable EMR habitat, but the site is entirely unoccupied by the species. This is typically confirmed through surveys (contact the Service for more information). In some cases it may be easier to assume EMR are present and use BMPs than to conduct surveys for the species.

For projects where there is a potential for effects to EMR, continue to the section of the document as follows:

For Tier 1 Habitat	Page 5
For Tier 2 Habitat	Page 6
Within the range of EMR	Page 7

For projects with a combination of Tier 1 and Tier 2 habitat, follow the instructions for Tier 1.

## Tier 1 Habitat

# Tier 1: Project will not affect EMR if all of the following apply:

- 1. Project will not result in any changes to suitable EMR habitat quality, quantity, availability or distribution, including changes to local hydrology
- 2. If EMR are present in the project area, they are not likely to have any response as a result of exposure to the action or any environmental changes as a result of the action
- 3. Project includes all General Best Management Practices:
  - a. Use wildlife-safe materials for erosion control and site restoration (see Erosion Control Resources side panel). In Tier 1 habitat, immediately eliminate use of erosion control products containing plastic mesh netting or other similar material that could entangle EMR.
  - b. To increase human safety and awareness of EMR, those implementing the project should first watch MDNR's "60-Second Snakes: The Eastern Massasauga Rattlesnake" video (available at <a href="https://youtu.be/-PFnXe e02w">https://youtu.be/-PFnXe e02w</a>), or review the EMR factsheet (available at <a href="https://www.fws.gov/midwest/endangered/reptiles/eam">https://www.fws.gov/midwest/endangered/reptiles/eam</a> a/pdf/EMRfactsheetSept2016.pdf or by calling 517-351-255.
  - c. Require reporting of any EMR observations, or observation of any other listed threatened or endangered species, during project implementation to the Service within 24 hours.

#### **Tier 1: Project Not Affecting EMR Coordination**

**Recommendation:** No pre-project coordination with Service needed. Document the steps above for your records.

**Tier 1: All Other Projects:** For any other projects in Tier 1 habitat that may affect EMR or its habitat, contact the Service for assistance in evaluating potential impacts. Best Management Practices (starting on page 8) are included for many actions to help with project planning, but may not be sufficient to avoid all adverse impacts. The Service can determine whether additional measures are necessary after a project-specific review.

### Erosion Control Resources

There are a variety of products that can be used for soil erosion and control requirements. These products may incorporate plastic mesh netting to help maintain form and function. This plastic netting has been demonstrated to entangle a wide variety of wildlife from birds to small mammals. In Michigan, soil erosion control netting has resulted in the documented mortality of a number of imperiled amphibian and reptile species including the EMR and the Eastern Fox Snake (State Threatened).

Several products for soil erosion and control exist that do not contain plastic netting including net-less erosion control blankets (for example, made of excelsior), loose mulch, hydraulic mulch, soil binders, unreinforced silt fences, and straw bales. Others are made from natural fibers (such as jute) and loosely woven together in a manner that allows wildlife to wiggle free. For more information regarding wildlife-safe erosion control measures contact the **USFWS** Michigan Ecological Services Field Office.

## Tier 2 Habitat

#### Tier 2: Project is not likely to adversely affect EMR if all of the following apply:

- 1. Project does not impact more than 1 acre of wetland habitat <u>and</u> includes all applicable activity-specific BMPs (starting on page 8), and
- 2. Project will not appreciably affect hydrology
- 3. Project includes all General Best Management Practices:
  - a. Use wildlife-safe materials for erosion control and site restoration (See Erosion Control Resources side panel, page 4). In Tier 2 habitat, eliminate the use of erosion control products containing plastic mesh netting or other similar material that could ensnare EMR as soon as is feasible but no later than January 1, 2018.
  - b. To increase human safety and awareness of EMR, those implementing the project should first watch MDNR's "60-Second Snakes: The Eastern Massasauga Rattlesnake" video (available at <a href="https://youtu.be/-PFnXe e02w">https://youtu.be/-PFnXe e02w</a>), or review the EMR factsheet (available at <a href="https://www.fws.gov/midwest/endangered/reptiles/eama/pdf/EMRfactsheetSept">https://www.fws.gov/midwest/endangered/reptiles/eama/pdf/EMRfactsheetSept 2016.pdf</a> or by calling 517-351-2555.
  - c. Require reporting of any EMR observations, or observation of any other listed threatened or endangered species, during project implementation to the Service within 24 hours.

<u>Tier 2: Project Not Likely to Adversely Affect EMR Coordination Recommendation</u>: Informal consultation with Service for actions requiring a Federal permit or funding. For non-Federal projects, document the steps above for your records, but no pre-project coordination with the Service needed.

<u>Tier 2: All Other Projects</u>: Coordinate with the Service for a project-level review to determine potential impacts and whether additional conservation measures are needed to avoid adverse effects.

# Within the known range of EMR

#### For projects within the known range of EMR, but outside of Tier 1 and Tier 2 habitat:

To help ensure your project is unlikely to affect EMR:

- 1. Project applies the General Best Management Practices:
  - a. Use wildlife-safe materials for erosion control and site restoration (See Erosion Control Resources side panel, page 4). By January 1, 2019, eliminate the use of erosion control products containing plastic mesh netting or other similar material that could ensure EMR (within the known range but outside of Tier1 or Tier 2 habitat).
  - b. To increase human safety and awareness of EMR, those implementing the project should first watch MDNR's "60-Second Snakes: The Eastern Massasauga Rattlesnake" video (available at <a href="https://youtu.be/-PFnXe e02w">https://youtu.be/-PFnXe e02w</a>), or review the EMR factsheet (available at
    - https://www.fws.gov/midwest/endangered/reptiles/eama/pdf/EMRfactsheetSept201 6.pdf or by calling 517-351-2555.
  - c. Require reporting of any EMR observations, or observation of any other listed threatened or endangered species, during project implementation to the Service within 24 hours.
- 2. Project will not have significant impacts to dispersal, connectivity, or hydrology of existing EMR potential habitat, i.e., filling less than 1 acre of wetland habitat or converting less than 20 acres of uplands of potential EMR habitat (uplands associated with high quality wetland habitat) to other land uses.

#### Within the Known Range, but Outside Tier 1 or 2 Coordination Recommendation:

Document the steps above for your records and no pre-project coordination with the Service needed. If you cannot implement the General Best Management Practices contact the Service for assistance in evaluating potential impacts.

### **Activity-Specific Best Management Practices**

For Tier 1, BMPs are included; however, even with implementation of the BMPs, project-specific review may be needed to determine whether they are sufficient to avoid all adverse impacts

- In Tier 1 habitat, contact the Service regarding the potential applicability of surveys to determine EMR absence in suitable habitat. In Tier 2, surveys can be conducted to confirm the presence of suitable habitat and/or the presence/probable absence of EMR. If onsite habitat is determined to be wholly unsuitable via desktop analysis (e.g., entirely mowed lawn, row crop, graveled lot, and industrial site), then it can be classified as unoccupied and the BMPs will not be necessary.
- Minimize work in Tier 1 and Tier 2 EMR habitat. When feasible, do not route new
  construction projects, such as pipelines, facilities, or access roads, through potential EMR
  habitat. Implement the use of wildlife-friendly corridors (e.g., oversized culverts) into new
  road design to maintain or enhance habitat connectivity.
- Projects should be designed to minimize the potential for disturbance to EMR during project activities.

# Maintenance Activities (includes nominal modifications to existing roads and infrastructure)

- 1. Ground Disturbing Activities
  - a. All
- No known EMR hibernacula are destroyed or disturbed at any time of year.
   Because these areas are often not known:
  - 1. For Tier 1: contact the Service to determine whether adverse impacts are likely as a result of ground disturbing work in Tier 1 habitat.
  - 2. For Tier 2: when operating in potential hibernation areas (e.g., EMR wetlands and adjacent areas with crayfish burrows, rodent holes, small mammal burrows, etc.), work is conducted well within the active season (June August) to avoid when snakes are likely to be present. During this time, they are most likely to be able to move out of the way of disturbance and have greater chances to find alternative hibernation sites. Destroying potential hibernacula may still impact snakes indirectly. Potential hibernation areas should be avoided to the extent possible.

#### b. Grading

i. When working during EMR active season, use exclusionary fencing to separate EMR habitat from the work site to prevent EMR from accessing the disturbance area. For example, in linear projects exclusionary fencing should run parallel to the disturbance, creating a barrier to snake movement. Each end of the exclusionary fencing should be angled away from the area of disturbance to direct snakes traveling along fencing away from the site. The

- exclusionary fencing will typically be traditional silt fence that is set up outside of all areas of disturbance and other types of fencing (i.e., snow fence used to delineate the work zone). <u>Do not</u> use fencing materials that can entangle or injure snakes.
- ii. Any areas using exclusionary fencing should first be "cleared" by a qualified individual before beginning construction activities. Fencing should be installed a minimum of 1 day before construction activities occur and walked weekly to ensure the integrity of the fence. If snakes are seen within the work zone, activity should stop until the snake can be safely moved, and the fence examined for breeches.
- iii. Revegetate all disturbed Tier 1 and Tier 2 habitat with appropriate plant species (i.e., native species or other suitable non-invasive species present on site prior to disturbance). Monitor all restoration plantings for proper establishment and implement supplemental plantings as necessary to ensure restorations are of equal to or better habitat quality than previous conditions.
- iv. In Tier 1 and Tier 2, avoid spread of invasive species into EMR habitat by following best practices. This includes inspecting and cleaning equipment and vehicles between work sites as needed to avoid the spread of invasive plant materials.

#### c. Trenching

i. In Tier 1 and Tier 2, avoid trenching in EMR wetlands when possible. In Tier 1, if open trenching is required install exclusionary fencing (follow measures 1(b)(i)-(iv)) and ensure the area is clear prior to trenching.

#### d. Fill

- i. In Tier 1 and Tier 2, ensure all imported fill material is free from contaminants or invasive species could affect the species or habitat through acquisition of materials at an appropriate quarry or other such measures.
- ii. In Tier 1 and Tier 2, use exclusionary fencing around the area to be filled and have the site "cleared" prior to placing fill by a qualified individual (as in 1(b)(i)-(ii).

#### e. Ditching

- i. For Tier 1 and Tier 2, conduct work well within the active season (June-August) when snakes are not likely to be near hibernation sites and can escape disturbance, or contact Service for project specific recommendations.
- ii. For Tier 1, use exclusionary fencing around the area to be cleared/graded and have the site cleared by a qualified individual prior to construction activities.
- iii. For Tier 1, contact the Service for work greater than 200' for project specific recommendations.

<sup>&</sup>lt;sup>1</sup> A qualified individual is someone who has received training on the identification and life history of EMR.

#### 2. Site Access with vehicles (both Tiers)

- a. Limit operating vehicles/equipment, clearing trees, etc., in EMR habitat to the inactive season when the ground is frozen. During this time, under these conditions, EMR are most likely underground and will not be impacted by these activities. When possible, use low-impact equipment such as light weight track mounted vehicles with low ground pressure. In Tier 1, if the ground isn't completely frozen (due to weather conditions during the inactive season or if working near seeps and springs that are less likely to freeze), or if working near potential hibernacula, manual access (on foot) may be required.
- b. Strictly control and minimize vehicle activity in known/presumed occupied EMR habitat to the extent possible. During EMR active season, speed limits at facilities and access roads (i.e., 2-track and gravel) in occupied habitat should be <15 MPH.
- c. In Tier 1 and Tier 2 habitat areas, drivers should be aware of the potential danger to the driver of swerving to intentionally drive over snakes as well as legal and conservation implications.

#### 3. Heavy Equipment (both Tiers)

- a. Spill Prevention for oils/fluids
  - i. Site staging areas for equipment, fuel, materials, and personnel at least 100 feet from the waterway, if available, to reduce the potential for sediment and hazardous spills entering the waterway. If sufficient space is not available, a shorter distance can be used with additional control measures (e.g., redundant spill containment structures, on-site staging of spill containment/clean-up equipment and materials). If a reportable spill has impacted occupied habitat:
    - 1. Follow spill response plan;
    - 2. Call MDEQ and the National Response Center (800-424-8802), and the Service's Michigan Ecological Services Field Office (517-351-2555) to report the release.
- b. Do not use large equipment or perform earth-moving activities, water withdrawal and discharge for hydrostatic testing, or other activities that substantially affect the ground or water levels in potential EMR hibernacula areas. Avoidance measures may include, but are not limited to, re-routing of pipeline and appurtenance facilities, boring or drilling, and timing/weather-related restrictions. Measures will be determined on a site-specific basis, based on local habitat conditions, contact Service for more information.

#### 4. Hydrology impacts (both Tiers)

i. Water levels in known/presumed occupied habitats should not be artificially manipulated during the inactive season.

ii. Where applicable, water levels should be allowed to flow naturally and not be artificially stabilized. This allows for the restoration of early successional habitats.

#### **Habitat Management and Restoration**

- 5. Vegetation Management
  - a. Mowing
    - i. In Tier 1, mow during the inactive season.
    - ii. For Tier 2, mowing is unrestricted during the inactive season. During the active season, follow daytime mowing restrictions and mow during times of day when snakes are less likely to be active (Figure 1). Increase mower deck height to >8 inches to reduce likelihood of injury to snakes. Higher deck height will reduce the risk of death or injury to snakes in the area.
    - iii. In areas with turf grass or areas where trying to discourage EMR (e.g., in areas around buildings), mow regularly and keep grass relatively short (less than 4-6 inches) to reduce its suitability for EMR. If starting with longer grass (greater than 6 inches), mow during the inactive season initially, and then maintenance mowing can occur during the active season (as long as it is regularly maintained and kept shorter than 4-6 inches, so that EMR is unlikely to use those areas). Unmaintained/longer grass may be used by snakes and make them vulnerable to mortality during the next mowing event.

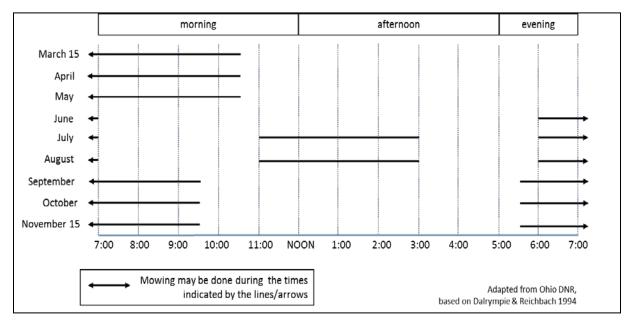


Figure 1. EMR Active season mowing schedule (NiSource Biological Opinion, page 273, USFWS 2015)

#### b. Cultivation (e.g., disking)

i. In Tier 1 habitat, disking should be limited to the inactive season, and areas within 50 m of known or potential hibernacula should be avoided. In Tier 2, disking can occur in the active season if area is mowed during the inactive season and maintained shorter than 4-5 inches.

#### c. Brush/Tree Removal

- i. In Tier 1, conduct brush or tree removal in known/presumed EMR habitat during the inactive season, when the ground is frozen (such that soils can be left undisturbed).
- ii. Use low impact harvest methods in Tier 1 and Tier 2 wetlands to cut and remove individual trees. This includes using low-impact equipment such as light weight track mounted vehicles with low ground pressure. In Tier 1, if the ground isn't completely frozen (due to weather conditions during the inactive season or if working near seeps and springs that are less likely to freeze), or if working near potential hibernacula, use hand tools and access site on foot.
- iii. In Tier 1 and Tier 2, do not burn brush piles during the active season. Dispose of brush offsite or leave in place.

#### d. Herbicides

- i. Follow all appropriate label instructions regarding which herbicide formulation to use in potential EMR habitat. Avoid spray drift beyond the target species/area (observing label instructions regarding optimal wind speed and direction, boom height, droplet size calibration, precipitation forecast, etc.).
- ii. Avoid broadcast applications of herbicides in Tier 1. Spot spraying or wicking can be used to control invasive plants in occupied habitat. If using broadcast spray in Tier 2, limit the area of exposure to less than half of the available EMR habitat to allow for untreated areas to provide potential areas of refugia from exposure. Contact the Service if you need help in determining this.

#### e. Prescribed burning (Tier 1 and Tier 2)

- i. Conduct prescribed burns during the inactive season before snakes emerge from hibernation. Walk the burn unit following the burn and report any dead or injured EMR to the Service within 24 hours. Burn only a portion (e.g., one-third) of available EMR habitat in any year to leave suitable cover for EMR and its prey.
- ii. Establish fire breaks using existing fuel breaks (roads, rivers, trails, etc.) to the greatest extent possible. Cultivation (disking or roto-tilling) of burn breaks will be minimized to the extent that human health and safety are not jeopardized. Cultivation and mowing to establish fire breaks will occur during the inactive season.

#### 6. Erosion control

a. Use wildlife-safe erosion control blankets (without plastic mesh netting in the layers of material) as required in the general BMPs. Remove all silt fence used for erosion control once soils are stable to reduce barriers to EMR movement.

#### 7. Revegetation

a. Revegetate all disturbed Tier 1 and Tier 2 habitat with appropriate plant species (i.e., native species or other suitable non-invasive species present on site prior to disturbance). Monitor all restoration plantings for proper establishment and implement supplemental plantings as necessary to ensure restorations are of equal to or better habitat quality than previous conditions.

#### 8. Invasive species

a. In Tier 1 and Tier 2, avoid spread of invasive species into EMR habitat by following best practices. This includes inspecting and cleaning equipment and vehicles between work sites as needed to avoid the spread of invasive plant materials.

#### 9. Wetland restoration

a. Restoring natural hydrology in areas that have been drained by tiling and ditching may greatly benefit EMR habitat. Conduct tile breaking or excavation well within the active season to avoid potential hibernacula. Have a qualified individual walk in front of the equipment to clear the area. Work with the Service for Tier 1 habitat to ensure no indirect adverse effects are expected as a result of restoration efforts.

#### 10. Water-level manipulation

a. Water levels should not be artificially manipulated during the inactive season to avoid impacts to hibernating snakes. Contact the Service in Tier 1 habitat when water levels will be manipulated during the inactive season or will result in significant alterations to EMR habitat during the active season.

# General Project Design Guidelines - Indiana Bat and 7 more species

Published by Michigan Ecological Services Field Office for the following species included in your project

Indiana Bat Myotis sodalis

Piping Plover Charadrius melodus

Karner Blue Butterfly Lycaeides melissa samuelis

Pitcher's Thistle Cirsium pitcheri Red Knot Calidris canutus rufa Whooping Crane Grus americana

Eastern Massasauga (=rattlesnake) Sistrurus catenatus

Northern Long-eared Bat Myotis septentrionalis

# Northern Long-eared Bat Project Review in Michigan

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	1. Standard Section 7 Consultation:	8
	2. NLEB Streamlined Consultation (optional for Federal projects that may affect but will not involve prohibited take of NLEB):	
	3. Range-wide Programmatic Consultation for Indiana Bat and Northern Long-eared Bat (optional Federal transportation projects that may affect NLEB):	for
٧/	MICHIGAN FOOLOGICAL SERVICES FIELD OFFICE CONTACT INFORMATION	a

#### I. BACKGROUND INFORMATION

The northern long-eared bat (NLEB) is one of the species of bats most impacted by the disease white-nose syndrome (WNS). Due to declines caused by WNS and continued spread of the disease, the NLEB was listed as threatened under the Endangered Species Act (ESA) on April 2, 2015. The U.S. Fish and Wildlife Service (Service) also developed a final 4(d) rule, which was published in the *Federal Register* on January 14, 2016. The 4(d) rule specifically defines "take" prohibitions for the species.

For more information on NLEB, its listing and the 4(d) rule, visit: <a href="https://www.fws.gov/Midwest/endangered/mammals/nleb/">https://www.fws.gov/Midwest/endangered/mammals/nleb/</a>

#### **NLEB** in Michigan

The NLEB is documented in many Michigan counties and is believed to range throughout the entire state. Therefore, unless presence/absence surveys conducted in accordance with Service guidelines

(https://www.fws.gov/MIDWEST/Endangered/mammals/inba/inbasummersurveyguidance.html, and also available via IPaC) indicate the probable absence of the species, NLEB are considered potentially present wherever suitable habitat exists within the state.

#### Suitable Habitat for NLEB:

During the winter, NLEB hibernate in mines, caves, or similar structures. Many NLEB hibernacula have been documented in Michigan; however, our knowledge of these overwintering areas throughout the state is likely incomplete.

Suitable summer habitat for NLEB consists of a wide variety of forested habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats, such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roost trees (i.e., live trees and/or snags ≥3 inches DBH that have exfoliating bark, cracks, crevices, and/or cavities), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure.

Individual trees may be considered suitable habitat when they exhibit characteristics of suitable roost trees and are within 1000 feet of other forested/wooded habitat. NLEB have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat boxes; therefore, these structures should also be considered potential summer habitat.

For more information on NLEB, its listing and the 4(d) rule, visit: <a href="https://www.fws.gov/Midwest/endangered/mammals/nleb/">https://www.fws.gov/Midwest/endangered/mammals/nleb/</a>

#### II. VOLUNTARY CONSERVATION MEASURES

NLEB benefit from the promotion of mature forest habitat, particularly hardwood/mixedwood stands containing standing snags, dying trees, and waterbodies such as streams, ponds, and forested wetlands. As NLEB are known to avoid traversing large open areas outside of migration, the protection and creation of wooded corridors (such as tree lines) can be extremely beneficial in connecting fragmented patches of suitable roosting/foraging habitat.

In general, projects that involve the trimming, burning, girdling, or clearing of suitable roost trees are encouraged to schedule these activities outside of the summer roosting period, which is generally April through September in Michigan. When winter tree removal is not feasible, avoiding the months of June and July (period when young bats are unable to fly) likely offers some protection for roosting NLEB that may be present.

Implementing conservation measures for NLEB helps to protect other native bat species, several which are experiencing recent population declines as a result of WNS and/or other factors. As significant predators of nocturnal insects, including many crop and forest pests, bats are important to Michigan's agriculture and forests. For example, Whitaker (1995)<sup>1</sup> estimated that a single colony of 150 big brown bats (*Eptesicus fuscus*) would eat nearly 1.3 million pest insects each year. Boyles et al. (2011)<sup>2</sup> noted that the "loss of bats in North America could lead to agricultural losses estimated at more than \$3.7 billion/year," and using their data for Michigan alone, we totaled the estimated value at over \$500 million per year (assuming standard crop pest survival). Taking proactive steps to help protect bats may be valuable to agricultural and timber producer yields and pest management costs.

Continue to the following sections for ESA guidance for Federal and non-Federal projects in Michigan.

#### III. ESA GUIDANCE: PRIVATE LANDOWNERS/NON-FEDERAL PROJECTS

NLEB use a wide variety of forested habitats but are not found in all wooded areas in Michigan. The species' local distribution and abundance is influenced by both the distance to hibernacula and the quality of available habitat. Although it can be difficult to predict where the species may occur, once NLEB colonize a forest habitat for raising their young (pups), they will often return to the same areas annually.

As a result of this fidelity to specific locations, the Service's approach to implementation of the ESA is based in part on "known" locations where important habitat for NLEB has been documented; namely, hibernacula and maternity roost trees.

<sup>&</sup>lt;sup>1</sup> Whitaker, J.O. 1995. Food of the Big Brown Bat *Eptesicus fuscus* from Maternity Colonies in Indiana and Illinois. American Midland Naturalist 134(2):346-360.

<sup>&</sup>lt;sup>2</sup> Boyles, J.G., P.M. Cryan, G.F. McCracken, and T.H. Kunz. 2011. Economic Importance of Bats in Agriculture. Science 332:41-42.

Please note that projects that require State permits or authorizations that implement Federal laws, or are supported by Federal funds (e.g., Clean Water Act, transportation projects), may have additional requirements under or similar to Section 7 of the ESA, as described in <u>section: IV. ESA GUIDANCE: FEDERAL PROJECTS</u>.

Additionally, please contact the Michigan Ecological Services Field Office (contact information at the end of this document) for project-specific recommendations for wind development projects. Utility-scale wind turbines may attract and cause mortality of NLEB and warrant additional considerations.

# In Michigan, what is required if there are no known NLEB hibernacula or roost trees near my project?

The Service does not require private landowners to conduct surveys for ESA-listed bats on their lands, nor do we require our guidelines for NLEB to be followed on lands where no roosts or hibernacula are known to occur. However, our records of these locations in Michigan are limited, and we expect NLEB roosts to be present in many locations in addition to those listed in this document.

#### **NLEB 4(d) Rule Take Prohibitions**

The definition of "take" pursuant to the ESA includes to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect (see 50 CFR 17.3 for details). Our implementing regulations further define the term "harm" to include any act which actually kills or injures fish or wildlife, and emphasize that such acts may include significant habitat modification or degradation that significantly impairs essential behavioral patterns of fish or wildlife.

The final 4(d) rule for the NLEB (50 CFR 17.40(o)) was published on January 14, 2016. Under the final rule, prohibitions in Michigan include:

- Actions that result in the incidental take of NLEB in known hibernacula.
- Actions that result in the incidental take of NLEB by altering a known hibernaculum's
  entrance or interior environment if it impairs an essential behavioral pattern, including
  sheltering NLEB.
- Tree-removal activities that result in the incidental take of NLEB when the activity: (1) occurs 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 of the maternity roost tree, during the pup season (June 1 through July 31).

Please note that not all tree-removal activities within the buffer of a hibernaculum or maternity roost tree will result in take. The timing and extent of tree removal may be an important consideration in those circumstances; please contact the Michigan Ecological Services Field Office to discuss your project plans in more detail. If your activity may result in incidental take that is prohibited based on the above, we will work with you to determine whether a permit pursuant to the ESA may be applicable.

#### Michigan Known Hibernacula and Roost Tree Locations for NLEB

We have compiled location information for NLEB hibernacula and known roosts trees in Michigan. This information can be used to help project planners in determining the applicability of provisions of the NLEB final 4(d) rule under the ESA. Please use the tables below to see if we have information that may be applicable to your project.

If you are planning a project that may impact suitable habitat in the Michigan townships below, please contact our office with more specific information on the location of your project, and we will confirm for you whether there are any known hibernacula within ¼ mile of your project or any known roost trees within 150 feet of your project.

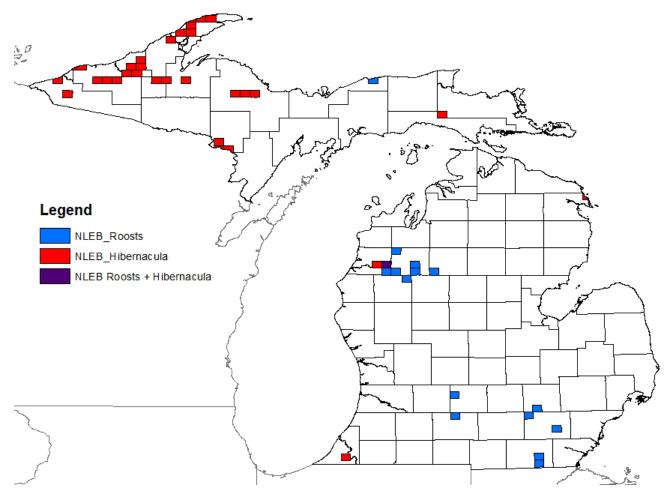
#### Where are the known NLEB hibernacula in Michigan?

	Known NLEB in Michigan					
County	Townships Containing Hibernacula and/or Buffer Areas	Number of Hibernacula	Landownership Within Buffer(s)			
Alpena	Alpena (T32NR9E)	1	Public			
Baraga	L'Anse (T49NR33W)	1	Private			
Berrien	Buchanan (T7SR18W)	1	Private			
Dickinson	Breitung (T40NR30W, T39NR30W), Norway (T39NR29W)	8	Private (8)			
Gogebic	Ironwood (T49NR46W); Bessemer/Wakefield (T47NR45W)	2	Private (1), public (1)			
Houghton	Adams/Quincy/Franklin/Stanton (T55NR34W); Calumet (T56NR33W); Laird (T49NR35W, T49NR36W); Schoolcraft (T56NR32W)	3	Private (1), public (2)			
Keweenaw	Allouez (T57NR32W, T58NR32W); Eagle Harbor/Grant (T58NR30W); Eagle Harbor/Houghton (T58NR31W)	10	Private (9), private + public (1)			
Mackinac	Hendricks (T44NR7W)	4	Public (4)			
Manistee	Dickson (T22NR14W, T22NR13W)	1	Private + public			
Marquette	Ely (T47NR28W); Tilden (T47NR27W); Richmond (T47NR26W)	3	Private (3)			
Ontonagon	Bohemia (T52NR37W); Carp Lake (T51NR44W, T51NR43W); Greenland (T51NR37W, T51NR38W, T50NR38W); Matchwood (T49NR41W, T49NR42W); Rockland (T50NR39W, T49NR40W)	42	Private (20), public (8), private + public (16)			

# Where are the known NLEB roost trees in Michigan?

Known NLEB Roost Tree Locations in Michigan					
County	Townships Containing Roosts and/or Buffer Areas	Number of known roosts	Landownership Within Buffer(s)		
Alger	Burt (T49NR14W)	5 (all female)	Public (5)		
Calhoun	Convis (T1SR6W)	1	Public (1)		
Eaton	Vermontville (T3NR6W)	1 (female)	Private (1)		
Lake	Dover (T20NR11W)	4 (all female)	Public (4)		
Lenawee	Ogden (T8SR4E), Palmyra (T7SR4E)	81	Private (81)		
Livingston	Putnam (T1NR4E)	2 (1 female)	Private (1), public (1)		
Manistee	Dickson (T22NR13W), Norman (T21NR13W)	4 (all female)	Private (2), public (2)		
Missaukee	Richland (T21NR8W)	4 (all female)	Private (4)		
Washtenaw	Lyndon (T1SR3E), Pittsfield (T3SR6E)	3 (2 female)	Private (2), public (1)		
Wexford	Cherry Grove (T21NR10W), Selma (T22NR10W), South Branch (T21NR12W), Wexford (T24NR12W)	20 (16 female)	Private (17), public (3)		

#### Map of Known NLEB Occurrence, Roosts, and Hibernacula in MI



<sup>\*</sup>Map last updated 7/22/2016. Map will be updated as additional information becomes available.

#### IV. ESA GUIDANCE: FEDERAL PROJECTS

#### 1. Standard Section 7 Consultation:

Under the ESA, requirements for Federal projects (i.e., projects funded, authorized, permitted, or implemented by a Federal agency) are different than requirements for wholly private or otherwise non-Federal projects. The ESA mandates all Federal departments and agencies to conserve listed species and to utilize their authorities in furtherance of the purposes of the ESA. Section 7 of the ESA, called "Interagency Cooperation," is the mechanism by which Federal agencies ensure the actions they conduct, including those they fund or authorize, do not jeopardize the existence of any listed species. Federal agencies must request a list of species and designated critical habitat that may be present in the project area from the Service (i.e., via IPaC, on our website at

https://www.fws.gov/midwest/Endangered/section7/sppranges/MIs7listrequest.html, or by contacting our office). Then they must determine whether their actions may affect those species or critical habitat. If a listed species or critical habitat may be affected, consultation with the Service is required. For general guidance on Section 7(a)(2) obligations for Federal projects, and step-by-step instructions on the process, please visit: https://www.fws.gov/midwest/Endangered/section7/s7process/index.html

Please note that Section 7 obligations or similar requirements may also apply to State permits or authorizations that implement Federal laws or projects that are supported by Federal funds (e.g., Clean Water Act, transportation projects).

# 2. NLEB Streamlined Consultation (optional for Federal projects that may affect but will not involve prohibited take of NLEB):

Federal actions that involve incidental take not prohibited under the final 4(d) rule for the NLEB may still result in effects to individual NLEB. As discussed above, section 7 of the ESA requires consultation with the Service if a Federal agency's action may affect a listed species. This requirement does not change when a 4(d) rule is implemented. However, for the NLEB 4(d) rule, the Service has provided a framework to streamline section 7 consultations when Federal actions may affect the NLEB but will not cause prohibited take. Federal agencies have the option to rely upon the finding of the programmatic biological opinion for the final 4(d) rule to fulfill their project-specific section 7 responsibilities by using the framework.

For more information on the NLEB Streamlined Consultation process and to download a Streamlined Consultation Form, visit:

https://www.fws.gov/Midwest/endangered/mammals/nleb/s7.html

Please note that use of the streamlined framework is optional, and an agency may choose to follow standard section 7 procedures instead. Even when take of NLEB is exempt, we encourage Federal agencies to implement voluntary conservation measures (i.e., winter tree removal) and avoid adverse effects to the species whenever possible.

If your project may result in prohibited take of NLEB (see "NLEB 4(d) Rule Take Prohibitions" above), standard section 7 procedures apply and this framework cannot be used.

# 3. Range-wide Programmatic Consultation for Indiana Bat and Northern Long-eared Bat (optional for Federal transportation projects that may affect NLEB):

The U.S. Fish and Wildlife Service and Federal Highway Administration (FHWA) have standardized their approach to assessing impacts to Indiana bats and NLEB from highway construction and expansion projects; then avoiding, minimizing and mitigating those impacts. This landscape-level conservation strategy encompasses the ranges of both bat species and provides transparency and predictability to FHWA and state Departments of Transportation (DOTs) through proactive planning. Information provided by this consultation and conservation strategy allows transportation agencies to strategically avoid projects in high impact or high risk areas for the Indiana bat and NLEB. For projects that cannot avoid impacts, project proponents receive information on ways to minimize impacts and preclude the need to revise projects later in their development. For large-scale projects or projects with greater impacts, priority conservation areas may be used to offset and minimize the impacts of the take. This approach is intended to increase the consistency of both project design and review, reduce consultation process timeframes and delays, and contribute meaningfully to the conservation of both species.

Please note that use of the Range-wide Programmatic Consultation for Indiana Bat and NLEB is optional for Federal transportation projects, and transportation agencies may choose to follow standard section 7 procedures instead. For more information on the Range-wide Programmatic Consultation for Indiana Bat and NLEB, including User Guide and Project Submittal Form documents, visit:

https://www.fws.gov/Midwest/endangered/section7/fhwa/index.html

#### V. MICHIGAN ECOLOGICAL SERVICES FIELD OFFICE CONTACT INFORMATION

Please contact the Michigan Ecological Services Field Office for more information on any projects occurring in Michigan.

U.S. Fish and Wildlife Service Michigan Ecological Services Field Office 2651 Coolidge Road, Suite 101 East Lansing, MI 48823 Phone: 517-351-2555

Fax: 517-351-2555

TTY: 1-800-877-8339 (Federal Relay)

e-mail: EastLansing@fws.gov

- **6.3 State Historic Preservation Office**
- $6.3.1 \ \ Application for Section 106 \, Review$



Submit one application for each project for which comment is requested. Consult the *Instructions for the Application for SHPO Section 106 Consultation Form* when completing this application.

Mail form, all attachments, and check list to: Michigan State Historic Preservation Office, 300 North Washington Square, Lansing, MI 48913

I.	GENERAL INFORMATION	New submittal
		☐ More information relating to SHPO ER# SHPO Project #
		☐ Submitted under a Programmatic Agreement (PA)
		PA Name/Date: PA name/date, if applicable

- a. Project Name: Village of Shelby Water Main Extension
- b. **Project Municipality**: Village of Shelby
- c. **Project Address** (*if applicable*): North Oceana Drive from north of 1372 North Ocean Drive to West Baseline Road; West Baseline Road from North Oceana Drive to approximately 2240 West Baseline Road
- d. County: Oceana

#### II. FEDERAL AGENCY INVOLVEMENT AND RESPONSE CONTACT INFORMATION

a. Federal Agency: USDA Rural Development

Contact Name: Andrew H. Granskog

Contact Address: 3001 Coolidge Rd, Suite 200 City: East Lansing State: Michigan Zip: 48823

Email: andy.granskog@usda.gov

Specify the federal agency involvement in the project: Project funder.

b. If HUD is the Federal Agency: 24 CFR Part 50  $\square$  or Part 58  $\square$ 

Responsible Entity (RE): Name of the entity that is acting as the Responsible Entity

Contact Name: RE Contact name

Contact Address: RE mailing address City: RE city State: RE State Zip: RE zip code

RE Email: RE contact's email Phone: RE contact's phone #

c. State Agency Contact (if applicable): Name of state agency

Contact Name: Name of state agency contact

Contact Address: State agency contact's mailing address City: State contact's city Zip: State contact's zip

code

Email: State contact's email Phone: State contact's phone #

d. Applicant (if different than federal agency): Fleis & VandenBrink

Contact Name: Peter M. Tierney

Contact Address: 2960 Lucerne Drive SE, Suite 100 City: Grand Rapids State: MI Zip: 49546

Email: ptierney@fveng.com Phone: 616.977.1000

e. Consulting Firm (if applicable): Commonwealth Heritage Group, Inc.

1

Contact Name: Brandon Gabler

REV 12.18.2020



Contact Address: 3215 Central Street City: Dexter State: MI Zip: 48130

Email: bgabler@chg-inc.com Phone: 571.488.5912

f. **Consulting Firm (if applicable):** Rural Community Assistance Program Contact Name: Jason Laney Senior Rural Development Specialist

Contact Address: 1511 E. Hastings Lk. Rd. City: Jonesville State: MI Zip: 49250

**Email:** jalaney@glcap.org Phone: 1-(517) 212-0814

#### **III. PROJECT INFORMATION**

#### a. Project Location and Area of Potential Effect (APE)

- i. Maps. Please indicate all maps that will be submitted as attachments to this form.
  - Street map, clearly displaying the direct and indirect APE boundaries
  - ☐Site map
  - ⊠USGS topographic map: Hart, Mears, Shelby, and Town Corners
  - ⊠Aerial map

  - ⊠Other: Soils in the APE, Deeply Buried Soil Potential

#### ii. Site Photographs

#### iii. Describe the APE:

The Project Area, or Archaeology APE is defined to include all areas that may be impacted by ground disturbing activities related to the Project undertaking. See b. Project Work Description below. The Archaeology APE is 14.4 ha (34.7 ac) and measures 4.4 km (2.7 mi) long and varies in width from 20.0 m (65.6 ft) to 170.0 m (558.5 ft).

The Above-Ground APE is 92.6 ha (229.0 ac) and accounts for indirect effects, and is considered to include those cultural resources (buildings, structures, objects, or sites) that are in the Project Area and a one-parcel/property-deep radius around it.

#### iv. Describe the steps taken to define the boundaries of the APE:

The boundaries of the Archaeology APE were defined by the Project Area itself (the limits of the Project as described by the Applicant/Fleis & VandenBrink to Commonwealth Heritage Group). This is the area where ground disturbance may occur. The Above-Ground APE was defined by assessing the area around the Project Area where any direct effects may occur, or visual/vibration effects that may affect a historic property's setting. Only resources that are within the direct viewshed of the Project were included in the APE. The proposed Project activities are not visible from resources that are farther away due to a large number of buildings and trees that further obscure any views; the Project is unlikely to have visual or auditory effects on these resources. Commonwealth and the Client/Fleis & VandenBrink determined that a single-parcel-deep Above-Ground APE was appropriate in this setting.

#### b. Project Work Description

Describe all work to be undertaken as part of the project:

2

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The Project includes installing a 4.4-km-long (2.71-mi) water main extension from the Village of Shelby north into Shelby Township to Peterson Farms in order to connect nine apartment buildings to the Village of Shelby's water system. The water main extension will be in the right-of-way (ROW) but outside of the existing roadway. The project will also include a booster station near the intersection of West Weaver Road and 79th Avenue.

#### IV. IDENTIFICATION OF HISTORIC PROPERTIES

_	Saana	of Effort	Applied
a.	Scope	OI EIIOIT	Abblied

i. List sources consulted for information on historic properties in the project area (including but not limited to SHPO office and/or other locations of inventory data).

Commonwealth conducted a literature review at the Michigan SHPO, compiling information regarding previously identified archaeological sites and surveys in the Archaeology APE and in the surrounding 1.6-km (1.0-mi) Archaeology Study Area. In addition, Commonwealth compiled information derived from a review of the National and State Registers of Historic Places, historic aerials and maps, and online soils data for understanding archaeological potential in the Project Area.

Commonwealth conducted a literature review at the Michigan SHPO for the Above-Ground Study Area, which extends 0.5 mi (0.8 km) beyond the project location, to identify any previously recorded above-ground resources or previously conducted above-ground surveys. Commonwealth also compiled information derived from a review of the National and State Registers of Historic Places, historic aerials and maps, and online repositories.

- ii. Provide documentation of previously identified sites as attachments.
- iii. **Provide a map** showing the relationship between the previously identified properties and sites, your project footprint and project APE.
- iv. Have you reviewed existing site information at the SHPO: ⊠Yes □ No
- v. Have you reviewed information from non-SHPO sources: ⊠Yes □ No

#### b. Identification Results

I.	Α	bo	ve-	-gı	0	ur	ηd	Р	rc	p	er	'tı	es	3
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- A. Attach the appropriate Michigan SHPO Architectural Identification Form for each resource or site 50 years of age or older in the APE. Refer to the *Instructions for the Application for SHPO Section 106 Consultation Form* for guidance on this.
- B. Provide the name and qualifications of the person who made recommendations of eligibility for the above-ground identification forms.

Name Katie Remensnyder	<b>Agency/Consulting Firm:</b> Commonwealth Heritage Group, Inc.			
Is the individual a 36CFR Par	rt 61 Qualified Historian or Architectural Historian ⊠ Yes □ No			
Are their credentials	currently on file with the SHPO? $oxtimes$ Yes $\oxtimes$ No			



If NO attach this individual's qualifications form and resume.



i.	<b>Archaeology</b> (complete this section if the project involves temporary or permanent ground disturbance)						
	Submit the following information using attachments, as necessary.						
	A.	Attach Archaeological Sensitivity Map. Please see letter report					
	B.	Summary of previously reported archaeological sites and surveys:					
		Please see letter report					
	C.	Town/Range/Section or Private Claim numbers: T14N R17W Section: 3-5, 8, & 9					
	D.	Width(s), length(s), and depth(s) of proposed ground disturbance(s): Width: 20–170 m (66–558 ft); Length: 4367 m (14327 ft)					
	E.	Will work potentially impact previously undisturbed soils? ⊠ Yes □ No					
If YES, summarize new ground disturbance: Please see letter report  F. Summarize past and present land use:							
		Please see letter report					
	G.	Potential to adversely affect significant archaeological resources:					
	For moderate and high potential, is fieldwork recommended? ☐ Yes ☐ No						
		Briefly justify the recommendation:					
		Justification for recommendation of fieldwork					
	Н.	Has fieldwork already been conducted? ☐ Yes ⊠ No					
<ul> <li>If YES:</li> <li>□ Previously surveyed; refer to A. and B. above.</li> <li>□ Newly surveyed; attach report copies and provide full report reference here:</li> <li>Full report reference</li> <li>Provide the name and qualifications of the person who provided the information for the Archaeology section:</li> </ul>							
		Name: Emily Mueller Epstein Agency/Firm: Commonwealth Heritage Group, Inc. Is the person a 36CFR Part 61 Qualified Archaeologist? ☑ Yes ☐ No Are their credentials currently on file with the SHPO? ☑ Yes ☐ No If NO, attach this individual's qualifications form and resume.					

Archaeological site locations are legally protected.

This application may not be made public without first redacting sensitive archaeological information.

#### **V. IDENTIFICATION OF CONSULTING PARTIES**

# MICHIGAN SHPO STATE HISTORIC PRESERVATION OFFICE

#### APPLICATION FOR SHPO SECTION 106 CONSULTATION

a. Provide a list of all consulting parties, including Native American tribes, local governments, applicants for federal assistance/permits/licenses, parties with a demonstrated interest in the undertaking, and public comment:

Identify consulting parties, mailing addresses, and email addresses.

b. Provide a summary of consultation with consultation parties:

Summary of consultation with parties other than the SHPO

c. Provide summaries of public comment and the method by which that comment was sought:

Public comment summary

#### VI. DETERMINATION OF EFFECT

Guidance for applying the Criteria of Adverse Effect can be found in the Instructions for the Application for SHPO Section 106 Consultation Form.

a. Basis for determination of effect:

The Project proposes to extend the Village of Shelby watermain 4.4 km (2.71 mi) to nine apartment buildings and Peterson Farms and will include a booster station. The Michigan SHPO has no records for archaeological resources in the footprint of the proposed Project. Three unverified archaeological sites (20OA97, 20OA98, and 20OA271) are on record with Michigan SHPO for the 1.6-km (1.0-mi) Archaeology Study Area. SHPO has no record of previous archaeological investigations in the Archaeology APE or the Archaeology Study Area. Data presented in this letter report suggest the probability of encountering buried archaeological sites in the footprint of the Project, as designed, is low.

Based on the literature review, there are no previously recorded above-ground resources in the Above-Ground APE. Commonwealth identified 28 additional above-ground resources over 50 years of age in the Above-Ground APE. All of these resources are recommended not eligible for listing in the NRHP, and are therefore not considered historic. No historic properties will be affected by the Project's activities.

b.	Determination	of	effect

No historic properties will be affected or
Historic properties will be affected and the project will (check one):
☐ have <b>No Adverse Effect</b> on historic properties within the APE.
☐ have an <b>Adverse Effect</b> on one or more historic properties in the APE and the federal agency, or federally authorized representative, will consult with the SHPO and other parties to resolve the adverse effect under 800.6



☐ <b>More Information Needed:</b> We are initiating early consulta submitted to the SHPO at a later date, pending results of surve	
Federally Authorized Signature:	Date:
Type or Print Name:	
Title:	

7



#### ATTACHMENT CHECKLIST

Identify any materials submitted as attachments to the form:
☐ Additional federal, state, local government, applicant, consultant contacts
Number of maps attached: number of maps
⊠ Site Photographs
⊠Map of photographs
☐ Plans and specifications
☐ Other information pertinent to the work description: Identify the type of materials attached
☐ Documentation of previously identified historic properties
☑ Architectural Properties Identification Forms
☑ Map showing the relationship between the previously identified properties, your project footprint, and project APE
☐ Above-ground qualified person's qualification form and resume
☑ Archaeological sensitivity map
□ Survey report
☐ Archaeologist qualifications and resume
☑ Other: Soils map of the Archaeology APE

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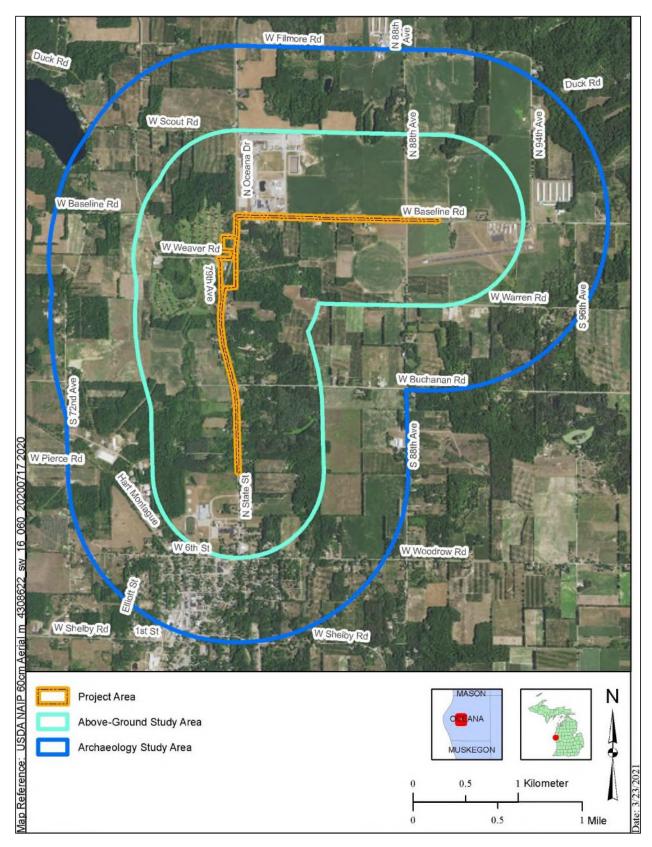


Figure 1. Project location



#### ANDREW J. WEIR, PRESIDENT

ajweir@chg-inc.com

#### **HEADQUARTERS**

3215 Central Street Dexter, MI 48130 P: (517) 788-3550

March 23, 2021 J-1310/R-1538

Peter M. Tierney, EIT Fleis & VandenBrink 2960 Lucerne Drive SE, Suite 100 Grand Rapids, MI 49546

# **RE:** Village of Shelby Water Main Extension, Village of Shelby, Oceana County, Michigan

Dear Mr. Tierney,

Commonwealth Heritage Group, Inc. (Commonwealth) completed a preliminary cultural resources assessment for Fleis & VandenBrink (Client) for the Village of Shelby Water Main Extension Project (Project) in Sections 3–5, 8, and 9 of T14N R17W and Sections 32–34 of T15N R17W in the Village of Shelby, Oceana County, Michigan (Figure 1). The Client provided maps of the Project location to Commonwealth on February 17, 2021. Project funding is through the Land and Water Conservation Fund (LWCF). Given the federal nexus, the Project is considered an undertaking under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (Public Law 89-665), and is therefore subject to review by the Michigan State Historic Preservation Office (SHPO) under the Section 106 implementing regulations (36 CFR 800).

The Project includes installing a 4.4-km-long (2.71-mi) water main extension from the Village of Shelby north into Shelby Township to Peterson Farms in order to connect nine apartment buildings to the Village of Shelby's water system. The water main extension will be in the right-of-way (ROW) but outside of the existing roadway. The project will also include a booster station near the intersection of West Weaver Road and 79<sup>th</sup> Avenue.

The Project Area (PA), or area of potential effects (APE) for archaeological resources (Archaeology APE), is defined to include all areas that may be impacted by ground-disturbing activities related to the Project undertaking. Those ground-disturbing Project activities include excavation to install the water main extension and the booster station construction. The Archaeology APE is 14.4 ha (34.7 ac) and measures 4.4 km (2.7 mi) long and varies in width from 20.0 m (65.6 ft) to 170.0 m (558.5 ft). The Above-Ground APE is 92.6 ha (229.0 ac) and

#### **OTHER LOCATIONS**

Alexandria, VA (703) 354-9737 Columbus, OH (614) 549-6190 Gainesville, FL (352) 372-2633 Littleton, MA (978) 793-2579 Milwaukee, WI (414) 446-4121 Minneapolis, MN (763) 354-9313 Ogden, UT (801) 394-0013 Tarboro, NC (252) 641-1444 Traverse City, MI (517) 262-3376 Tucson, AZ (517) 262-3376 West Chester, PA (610) 436-9000

accounts for indirect effects. It is considered to include those cultural resources (buildings, structures, objects, or sites) that are in the Project Area and a one-parcel/property-deep radius around it.

This letter report provides the results of the background research as well as an assessment of the potential for the APE to contain National Register of Historic Places (NRHP) eligible or listed *historic properties* that are protected under the National Historic Preservation Act (NHPA). For the background research, Commonwealth conducted a literature review at the Michigan State Historic Preservation Office (SHPO) compiling information regarding previously identified archaeological sites and surveys in the Archaeology APE and in the surrounding 1.6-km (1.0-mi) (Archaeology Study Area). Commonwealth compiled information derived from a review of the National and State Registers of Historic Places, historic aerials and maps, and online soils data for understanding the archaeological potential in the Archaeology APE. Commonwealth also conducted a desktop review of above-ground architectural/historic resources in the Above-Ground Study Area, which extends in a radius of 0.8 km (0.5 mi) beyond the project location.

#### **Archaeological Review**

#### Soils

Soils in the Archaeology APE are typical for this portion of the western lower peninsula of Michigan. Most are well-drained sandy soils that developed from sandy glaciofluvial deposits and/or aeolian deposits (Figure 2 and Table 1). Granby mucky loamy sand, gravelly substratum and Altmar loamy fine sand, which comprise roughly 30% or 4.05 ha (10.02 ac) of soils in the Archaeology APE (Table 2). These soils have relatively poor drainage and their spatial distribution generally coincides with where Piper Creek crosses the Archaeology APE near the intersection of North State Street and West Weaver Road.

Table 1. Soils identified in the Archaeology APE

Soil Code	Soil Name	Drainage	Acreage
41	Granby mucky loamy sand, gravelly substratum	Poorly drained	4.28
37A	Altmar loamy fine sand, 0 to 3 percent slopes	Somewhat poorly drained	5.74
43B	Spinks loamy fine sand, 0 to 6 percent slopes	Well drained	6.67
43C	Spinks loamy fine sand, 6 to 12 percent slopes	Well drained	1.88
98B	Spinks-Scalley complex, 0 to 6 percent slopes	Well drained	0.39
103B	Spinks-Okee complex, 0 to 6 percent slopes, lake moderated	Well drained	0.98
106D	Spinks loamy fine sand, 12 to 18 percent slopes, lake moderated	Well drained	0.36
49B	Grattan sand, 0 to 6 percent slopes	Excessively drained	1.35
49C	Grattan sand, 6 to 18 percent slopes	Excessively drained	0.41
49F	Grattan sand, 35 to 70 percent slopes	Excessively drained	1.35
59B	Benona sand, 0 to 6 percent slopes	Excessively drained	4.87
59C	Benona sand, 6 to 18 percent slopes	Excessively drained	6.38

#### Land Ownership

General Land Office (GLO) records managed by the Bureau of Land Management (BLM) indicate that Shelby Township was originally surveyed in 1818 (2021). The survey maps showed no structures on or near the parcel in which the Archaeology APE is located. The original survey does not record specific topographic or environmental details on Section 14, but notes that Section 11, to the north, had both dry and swampy areas.

Table 2. Land patents issued following original survey of T02N R13E

Accession Number	Date	Section & Aliquots, Section Number	Original Title Holder	H.F. Walling, 1873	Geo. A. Ogle & Co. 1895	Geo. A. Ogle & Co. 1916
CV-0070-520	October 2, 1829	T02N R13E, Section 14	Leroy, Daniel	Subdivided	Subdivided	Subdivided

An 1876 plat map reveals residential structures towards the southern end of the Archaeology APE, near the Village of Shelby center (Figure 3) (F.W. Beers & Co. 1876). Additional subdivision and building construction is evident in the 1913 plat map (Figure 4) (Geo. A. Ogle & Co. 1913). W.W. Hixson & Co. (192X) map does not locate structures (Figure 5). Areas north of Shelby retained agricultural land use the longest. The railroad tracks marked as the Pere Marquette railroad in Figure 5, are apparent in the previous plat maps as well. Historic aerials and topo maps reveal the same developmental patterns (NETROnline 2021).

#### Archaeological Sites and Surveys

According to the files maintained by the Michigan SHPO, there are no previously recorded archaeological sites or investigations for the Archaeology APE. Michigan SHPO has records for three previously recorded archaeological sites (20OA97, 20OA98, and 20OA271) and no previously recorded archaeological investigations in the Archaeology Study Area (Figure 6; Table 3 and Table 4).

According to Michigan SHPO records, 20OA97 indicates the unverified location of a nineteenth-and twentieth-century American cemetery. The site record is based on archival documentation (Geo. A. Ogle & Co. 1913), but has no archaeologically verified location. As such, more information is required before 20OA97 may be evaluated for listing in the NRHP.

20OA98 is on record with Michigan SHPO as a nineteenth-century coal kiln complex. The unverified site is based on archival documentation (Anonymous 1882) and lacks an archaeologically verified location. More information is required before 20OA98 may be evaluated for listing in the NRHP.

20OA271 is the reported location of a World War II internment camp for German prisoners of war. Photographs on file with Michigan SHPO include labels indicating it was once known as Shelby P. W. Camp. The location is now a Shelby public park, known as Getty Park. Four brick pillars erected at the time the camp was established remain standing at the park. 20OA271 has

not been subjected to archaeological investigation and its eligibility for listing in the NRHP remains unevaluated.

Table 3. Previously recorded archaeological sites

Site Number	Location	Period	Culture	Function	Field Verification Status	NRHP Eligibility Status	In Archaeology APE or Archaeology Study Area
20OA97	T14N R17W	Nineteenth Century– Twentieth Century	American	Cemetery	Unverified	More information needed/unevaluated	Archaeology Study Area
20OA98	T14N R17W Sect. 8 SW- NW	Nineteenth Century		Coal kiln complex	Unverified	More information needed/unevaluated	Archaeology Study Area
20OA271 "Getty Park"	T14N R17W Sec. 8, SE¼- SE¼	WW II-era	American	German Internment Camp	Unverified	More information needed/unevaluated	Archaeology Study Area

In addition to surface and near-surface soils that may harbor archaeological resources, cultural materials and features may become buried beneath significant amounts of sediments. Research by Monaghan and Lovis (2005) concluded that deeply buried soils, and therefore deeply buried cultural resources, have an increased likelihood where fluvial deposits overlie alluvial deposits as a result of waterway's breaching their banks. Monaghan and Lovis (2005) developed a geoarchaeological model for southeastern Michigan that takes these effects into account and rates area likelihood from Low, a score of 1, to High-Very High, 500+.

Figure 7 shows the results of the Monaghan and Lovis (2005) model applied to the Archaeology APE and Archaeology Study Area. Soils in the Archaeology APE as well as the majority of the Archaeology Study Area are classified as "Low" for which Monaghan and Lovis indicate "GIS coverages for the area complete enough to show the potential of finding buried sites is low. These areas are typically not within floodplains, mid-Holocene lake plains, or other areas where site burial is likely. Areas within urban settings, however, may include sites buried by historic cultural fills related to urbanization" (Monaghan and Lovis 2005:194).

The Piper Creek drainage is rated as "High" for which Monaghan and Lovis recommend deep testing, but the drainage is outside the Archaeology APE.

#### **Above-Ground Resources**

For the Village of Shelby Water Main Extension Project, the Above-Ground APE that accounts for indirect effects is considered to include those cultural resources (buildings, structures, objects, or sites) that are in the Project Area and a one-parcel/property-deep around it. Commonwealth conducted a literature review for the Above-Ground Study Area, which extends 0.5 mi (0.8 km) beyond the project location, to identify any previously recorded above-ground resources (see Figure 1). Review of SHPO survey files revealed that there are no previously recorded above-ground resources in the Above-Ground Study Area or the Above-Ground APE.

Commonwealth identified 28 above-ground properties in the Above-Ground APE that are over 50 years of age (Figure 8). Of the 28 newly identified properties, none are recommended eligible for listing in the NRHP. They are either common examples of their forms or have lost historic integrity due to replacement materials, additions, or alterations, and do not meet NRHP Criterion C for architectural significance. Each of these properties was photographed by a Commonwealth architectural historian as part of the Section 106 form submission on March 12, 2021 (Figure 9 through Figure 36).

Table 4. Newly identified resources in the Above-Ground APE

Address	Construction Date	Eligibility Recommendation
2593 W Baseline Road	ca. 1970	Not eligible
2725 W Baseline Road	ca. 1910	Not eligible
3037 W Baseline Road	ca. 1965	Not eligible
3202 W Buchanan Road	ca. 1900	Not eligible
25 N Oceana Drive	ca. 1970	Not eligible
68 S Oceana Drive	ca. 1970	Not eligible
83 S Oceana Drive	ca. 1965	Not eligible
110 S Oceana Drive	ca. 1900	Not eligible
171 S Oceana Drive	ca. 1930	Not eligible
200 S Oceana Drive	ca. 1950	Not eligible
331 S Oceana Drive	ca. 1960	Not eligible
397 S Oceana Drive	ca. 1970	Not eligible
412 S Oceana Drive	ca. 1900	Not eligible
435 S Oceana Drive	ca. 1955	Not eligible
455 S Oceana Drive	ca. 1940	Not eligible
500 S Oceana Drive	ca. 1965	Not eligible
521 S Oceana Drive	ca. 1930	Not eligible
581 S Oceana Drive	ca. 1920	Not eligible
623 S Oceana Drive	ca. 1960	Not eligible
638 S Oceana Drive	ca. 1940	Not eligible
687 S Oceana Drive	ca. 1900	Not eligible
913 S Oceana Drive	ca. 1950	Not eligible
962 S Oceana Drive	ca. 1900	Not eligible
965 S Oceana Drive	ca. 1900	Not eligible
1021 S Oceana Drive	ca. 1930	Not eligible
1118 S Oceana Drive	ca. 1900	Not eligible
1142 S Oceana Drive	ca. 1940	Not eligible
1147 S Oceana Drive	ca. 1970	Not eligible

#### **Recommendations**

The Project proposes to extend the Village of Shelby watermain 4.4 km (2.71 mi) to nine apartment buildings and Peterson Farms and will include a booster station. The Michigan SHPO has no records for archaeological resources in the footprint of the proposed Project. Three unverified archaeological sites (20OA97, 20OA98, and 20OA271) are on record with Michigan SHPO for the 1.6-km (1.0-mi) Archaeology Study Area. SHPO has no record of previous archaeological investigations in the Archaeology APE or the Archaeology Study Area. Data presented in this letter report suggest the probability of encountering buried archaeological sites in the footprint of the Project, as designed, is low.

Based on the literature review, there are no previously recorded above-ground resources in the Above-Ground APE. Commonwealth identified 28 additional above-ground resources over 50 years of age in the Above-Ground APE. All of these resources are recommended not eligible for listing in the NRHP, and are therefore not considered historic. No historic properties will be affected by the Project's activities.

Commonwealth is pleased to have been able to assist with your cultural resource review. Please do not hesitate to contact either of us or the Michigan Regional Director, Brandon Gabler (571-488-5912; bgabler@chg-inc.com) if you have any additional questions or concerns related to this letter or require assistance with future cultural resources projects.

Sincerely,

Emily Mueller Epstein, Ph.D.

Principal Investigator emily.epstein@chg-inc.com

P: 517.262.4157

Katie Remensnyder Architectural Historian

Kathe Remenyon

kremensnyder@chg-inc.com

P: 517.262.9484

## Freedom of Information Act (FOIA) Notice

The location of any archaeological site is considered sensitive information and is protected from release under the Freedom of Information Act (FOIA). Site location data should not be released to the public because the information may create a risk, harm, theft, or destruction of a non-renewable resource. Information on archaeological sites should only be shared with those individuals directly involved with the subject project. Archaeological site information should not be used for future unrelated projects.

#### **References Cited**

#### Anonymous

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#### Bureau of Land Management General Land Office (BLM GLO)

United States Department of the Interior Bureau of Land Management General Land Office Records database. Electronic document, https://glorecords.blm.gov/default.aspx, accessed July 14, 2020.

#### F.W. Beers & Co.

Topographical map of Oceana Co., Michigan. F.W. Beers & Co., New York, New York.

#### Geo. A. Ogle & Co.

1913 Standard Atlas of Oceana County, Michigan. Geo. A. Ogle & Co., Chicago, Illinois.

#### Monaghan, G. William, and William A. Lovis

2005 Modeling Archaeological Site Burial in Southern Michigan: A Geoarchaeological Synthesis. Environmental Research Series No. 1. Michigan State University Press, East Lansing, Michigan.

#### **NETROnline**

Historic Aerials. Electronic document, https://www.historicaerials.com/viewer, accessed March19, 2021.

#### W. W. Hixson & Company

192X Plat Book of Oceana County, Michigan. W.W. Hixson & Co., Rockford, Illinois.

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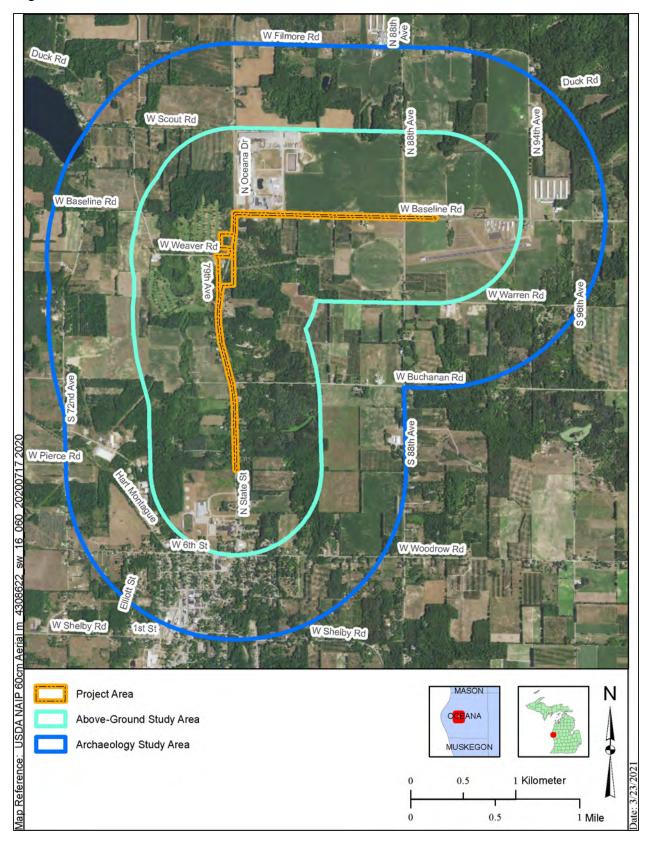


Figure 1. Project location

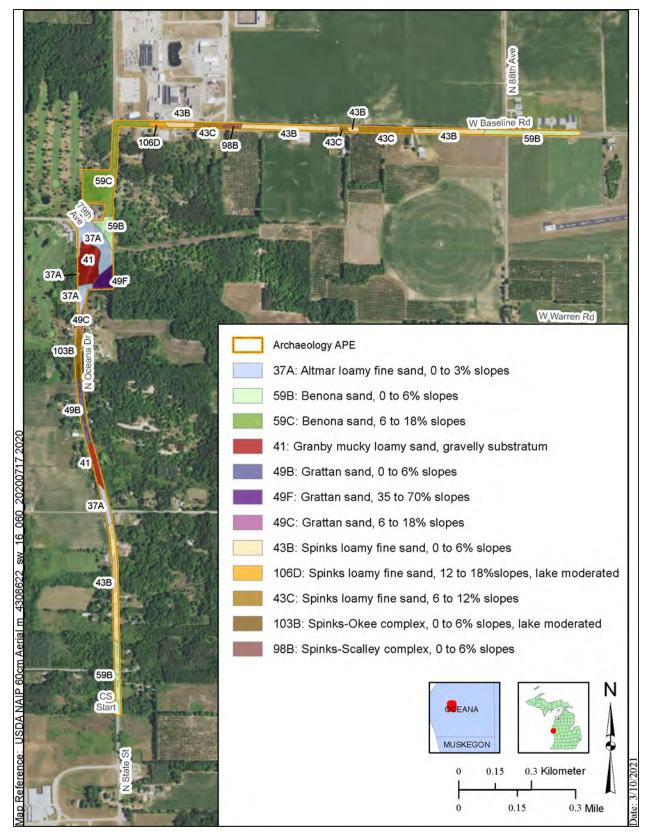


Figure 2. Soils in the Archaeology APE

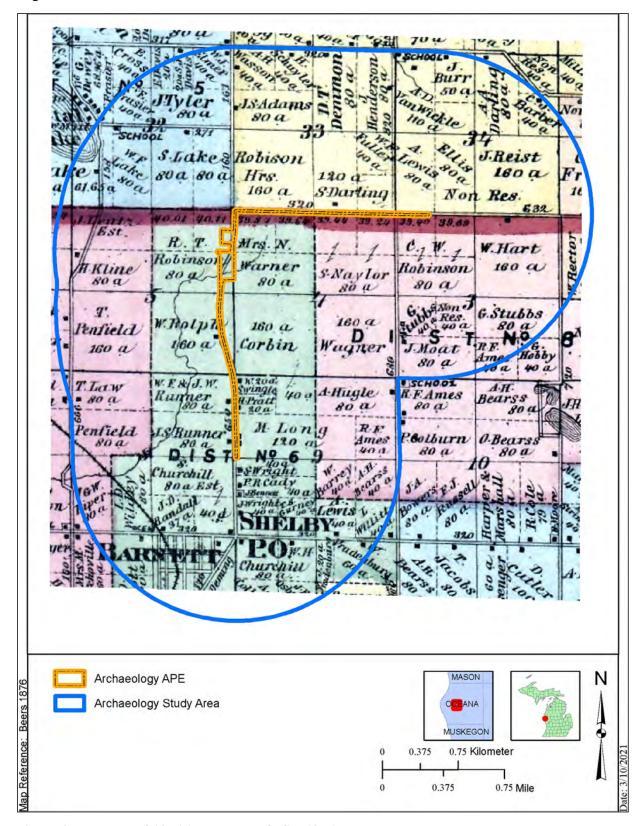


Figure 3. Plat map of 1876 (F.W. Beers & Co. 1876)

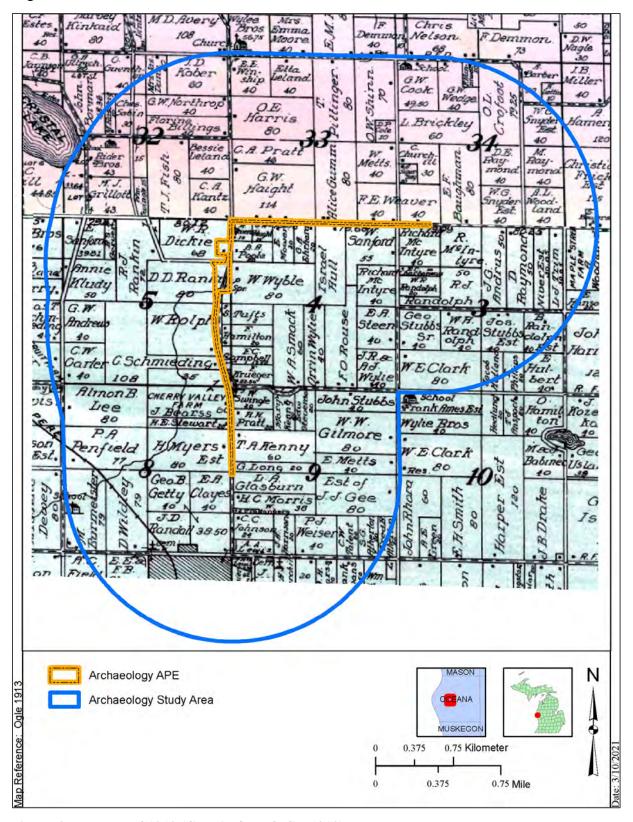


Figure 4. Plat map of 1913 (Geo. A. Ogle & Co. 1913)



Figure 5. Plat map of 192X (W. W. Hixson & Company 192X)

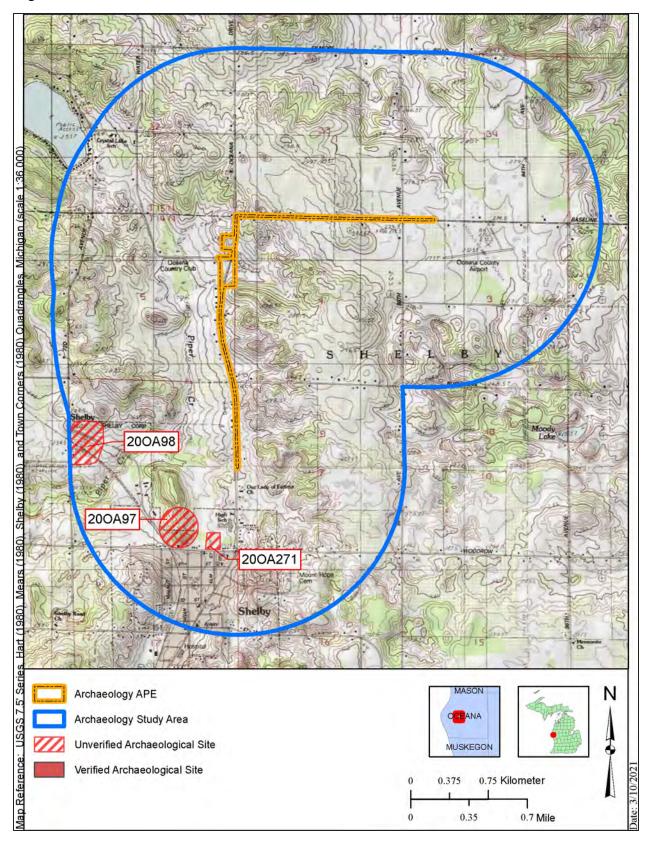


Figure 6. Previously identified archaeological sites and investigations

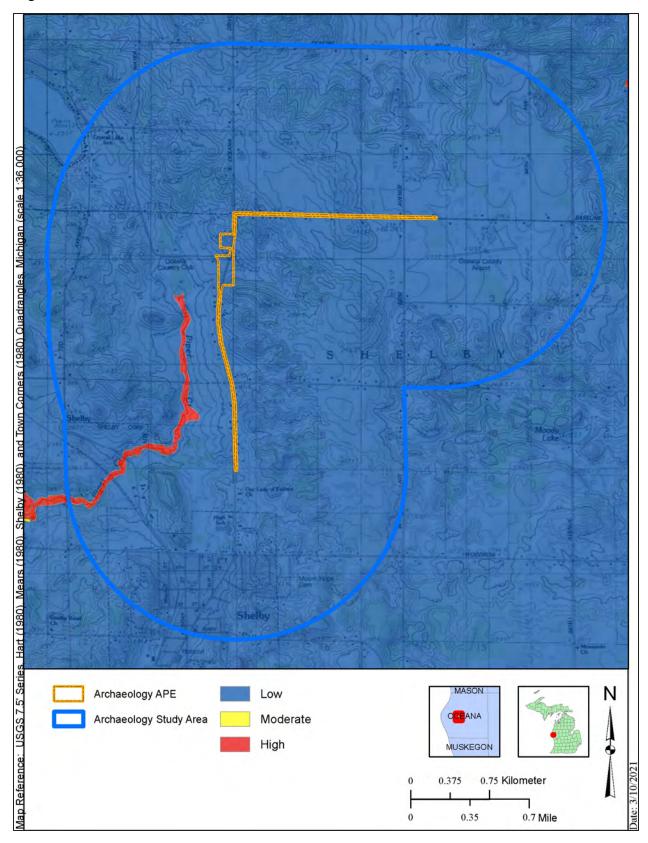


Figure 7. Potential for deeply buried archaeological sites

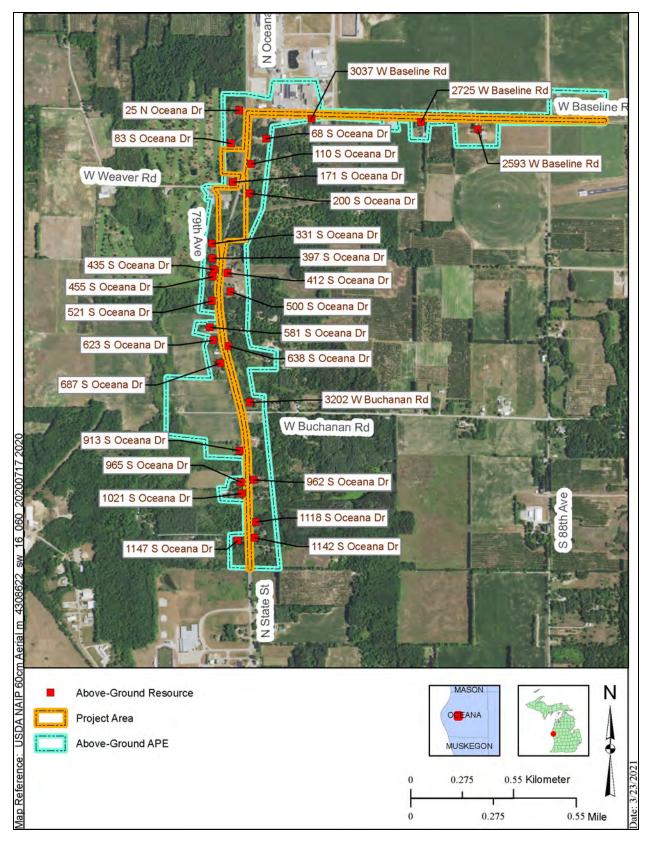


Figure 8. Above-Ground APE and identified above-ground resources over 50 years old



Figure 9. 2593 W Baseline Road, view to the southwest



Figure 10. 2725 W Baseline Road, view to the south-southwest



Figure 11. 3037 W Baseline Road, view to the south-southwest



Figure 12. 3202 W Buchanan Road, view to the northeast



Figure 13. 25 N Oceana Drive, view to the northwest



Figure 14. 68 S Oceana Drive, view to the southeast



Figure 15. 83 S Oceana Drive, view to the west



Figure 16. 110 S Oceana Drive, view to the northeast



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Figure 20. 397 S Oceana Drive, view to the west-northwest



Figure 21. 412 S Oceana Drive, view to the southeast



Figure 22. 435 S Oceana Drive, view to the northwest



Figure 23. 455 S Oceana Drive, view to the west-northwest



Figure 24. 500 S Oceana Drive, view to the southeast



Figure 25. 521 S Oceana Drive, view to the northwest



Figure 26. 581 S Oceana Drive, view to the west-northwest

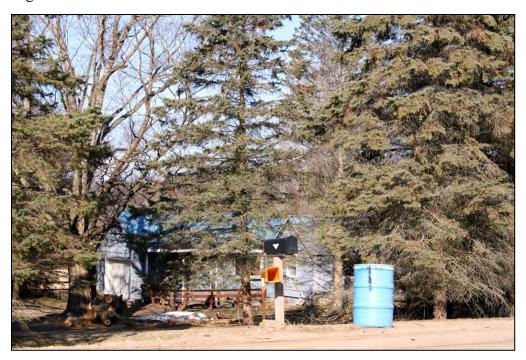


Figure 27. 623 S Oceana Drive, view to the northwest



Figure 28. 638 S Oceana Drive, view to the northeast



Figure 29. 687 S Oceana Drive, view to the southwest



Figure 30. 913 S Oceana Drive, view to the southwest



Figure 31. 962 S Oceana Drive, view to the southeast



Figure 32. 965 S Oceana Drive, view to the southwest



Figure 33. 1021 S Oceana Drive, view to the southwest



Figure 34. 1118 S Oceana Drive, view to the southeast



Figure 35. 1142 S Oceana Drive, view to the east-southeast



Figure 36. 1147 S Oceana Drive, view to the west



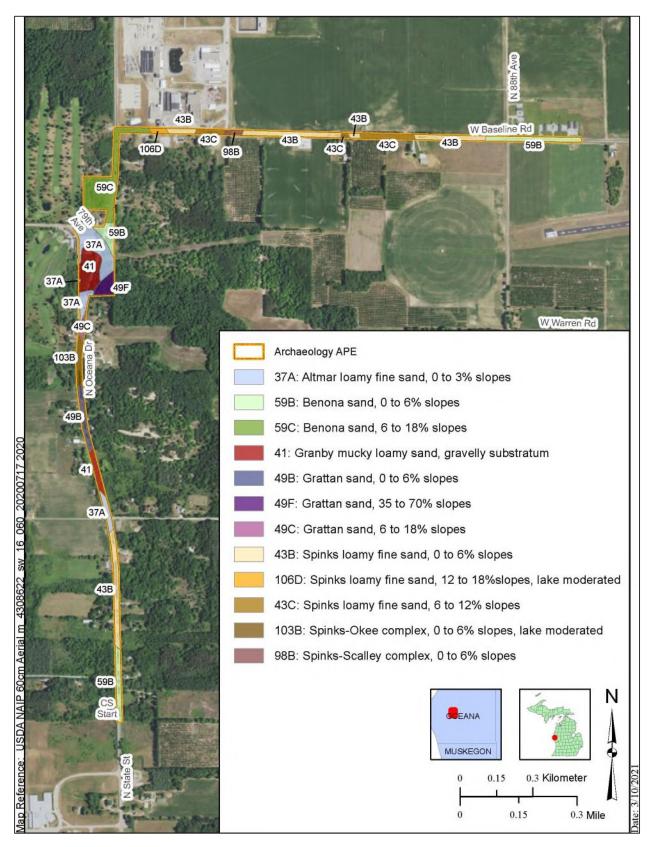


Figure 2. Soils in the Archaeology APE



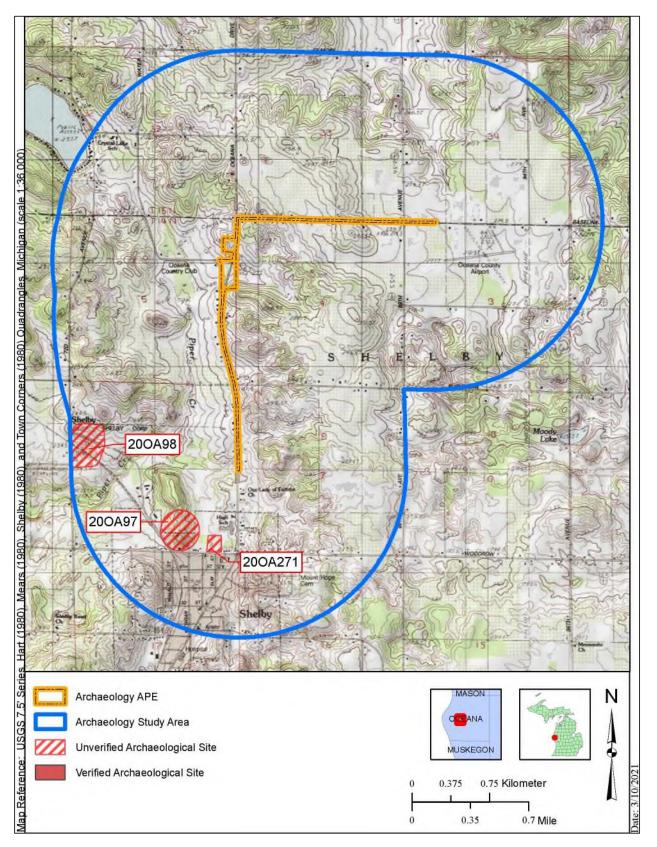


Figure 3. Previously identified archaeological sites and investigations



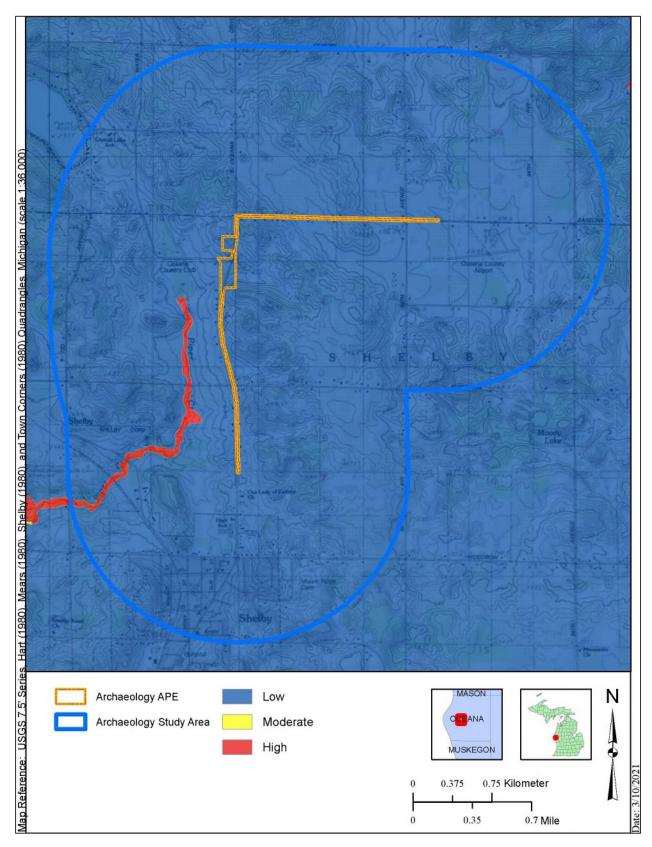


Figure 4. Potential for deeply buried archaeological sites

12



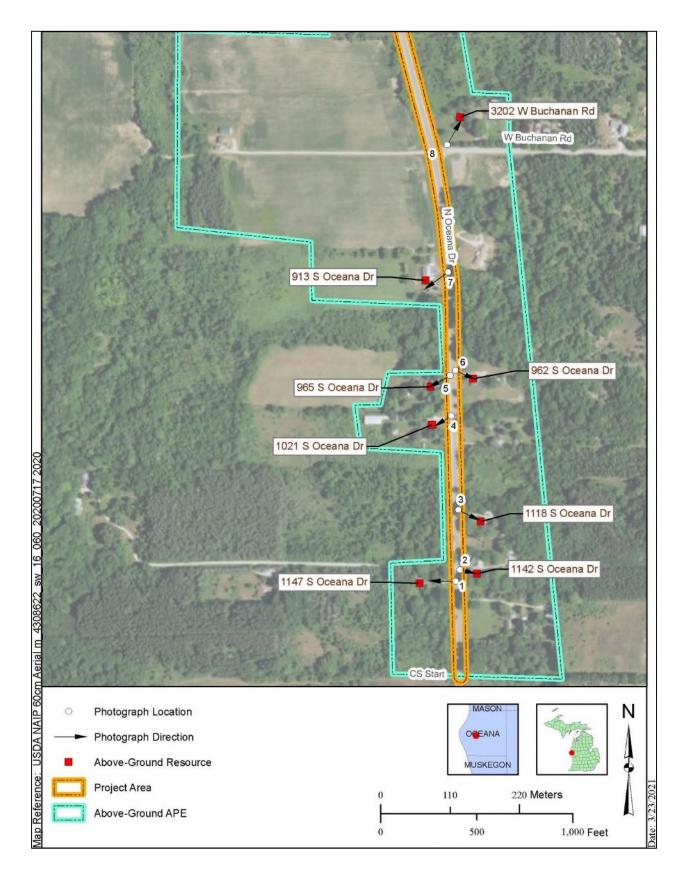




Figure 5. Above-Ground APE, identified above-ground resources over 50 years old, and photo locations, map 1 of 5



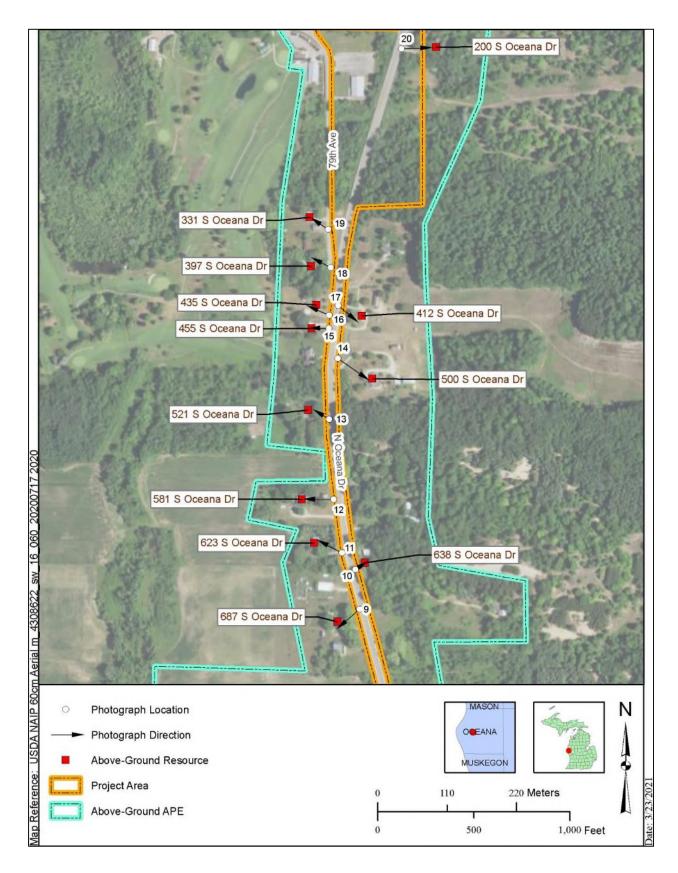




Figure 6. Above-Ground APE, identified above-ground resources over 50 years old, and photo locations, map 2 of 5



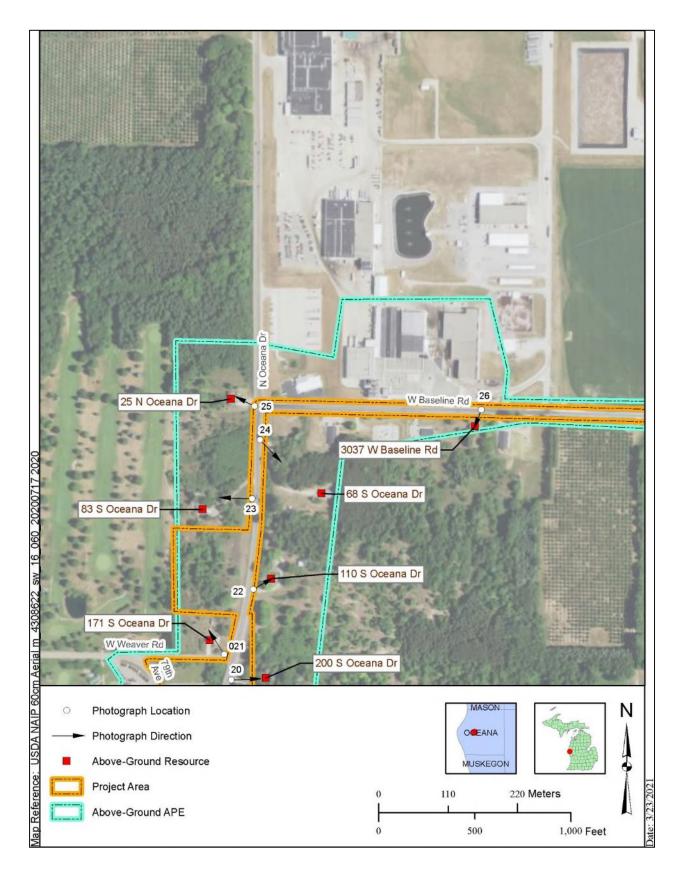




Figure 7. Above-Ground APE, identified above-ground resources over 50 years old, and photo locations, map 3 of 5



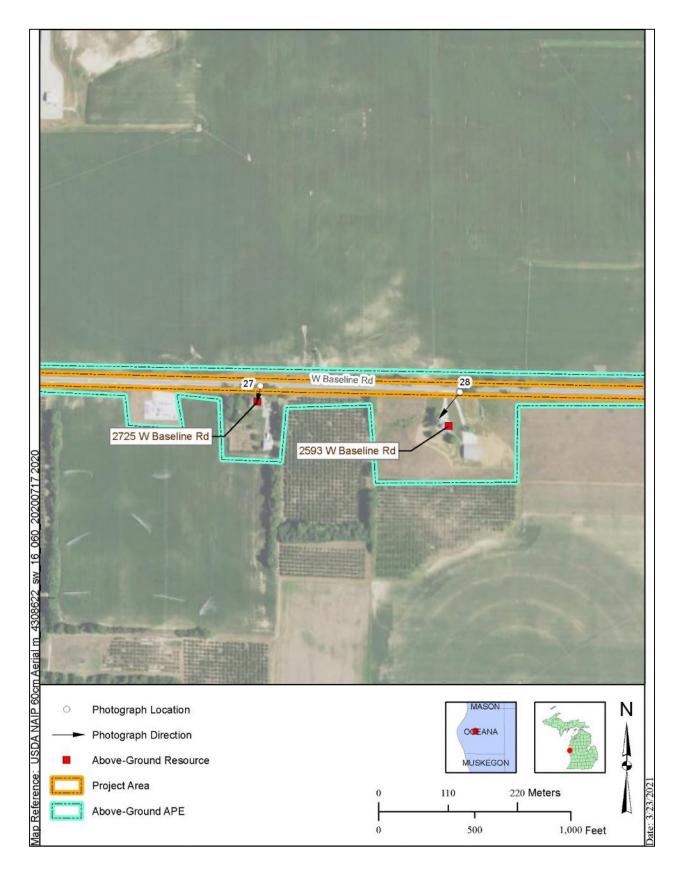




Figure 8. Above-Ground APE, identified above-ground resources over 50 years old, and photo locations, map 4 of 5



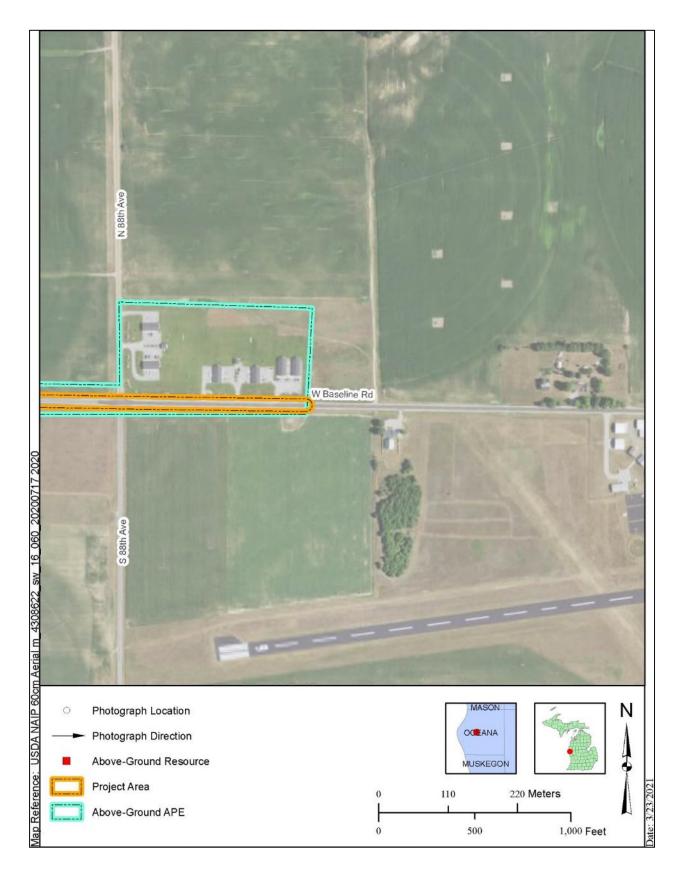




Figure 9. Above-Ground APE, identified above-ground resources over 50 years old, and photo locations, map 5 of 5



Photo Location 1. 1147 S Oceana Drive, view to the west



Photo Location 2. 1142 S Oceana Drive, view to the east-southeast





Photo Location 3. 1118 S Oceana Drive, view to the southeast



Photo Location 4. 1021 S Oceana Drive, view to the southwest





Photo Location 5. 965 S Oceana Drive, view to the southwest



Photo Location 6. 962 S Oceana Drive, view to the southeast





Photo Location 7. 913 S Oceana Drive, view to the southwest



Photo Location 8. 3202 W Buchanan Road, view to the northeast





Photo Location 9. 687 S Oceana Drive, view to the southwest



Photo Location 10. 638 S Oceana Drive, view to the northeast





Photo Location 11. 623 S Oceana Drive, view to the northwest



Photo Location 12. 581 S Oceana Drive, view to the west-northwest





Photo Location 13. 521 S Oceana Drive, view to the northwest



Photo Location 14. 500 S Oceana Drive, view to the southeast





Photo Location 15. 455 S Oceana Drive, view to the west-northwest



Photo Location 16. 435 S Oceana Drive, view to the northwest





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Photo Location 23. 83 S Oceana Drive, view to the west



Photo Location 24. 68 S Oceana Drive, view to the southeast





Photo Location 25. 25 N Oceana Drive, view to the northwest



Photo Location 26. 3037 W Baseline Road, view to the south-southwest





Photo Location 27. 2725 W Baseline Road, view to the south-southwest



Photo Location 28. 2593 W Baseline Road, view to the southwest

- **6.4 State Historic Preservation Officer Response**
- 6.5 Tribal Coordination



GRETCHEN WHITMER

# STATE OF MICHIGAN MICHIGAN STRATEGIC FUND STATE HISTORIC PRESERVATION OFFICE

MARK A. BURTON PRESIDENT

May 28, 2021

ANDREW GRANSKOG ENVIRONMENTAL COORDINATOR USDA RURAL DEVELOPMENT OFFICE 3001 COOLIDGE ROAD SUITE 200 EAST LANSING MI 48823

RE: ER-21-587 Village of Shelby Water Main Extension, Shelby, Oceana County (USDA)

Dear Mr. Granskog:

Under the authority of Section 106 of the National Historic Preservation Act of 1966, as amended, we have reviewed the above-cited undertaking at the location noted above. Based on the information provided for our review, the State Historic Preservation Officer (SHPO) concurs with the determination of USDA that <u>no historic properties are affected</u> within the area of potential effects of this undertaking.

This letter evidences USDA's compliance with 36 CFR § 800.4 "Identification of historic properties," and the fulfillment of USDA's responsibility to notify the SHPO, as a consulting party in the Section 106 process, under 36 CFR § 800.4(d)(1) "No historic properties affected." If the scope of work changes in any way, or if artifacts or bones are discovered, please notify this office immediately.

We remind you that federal agency officials or their delegated authorities are required to involve the public in a manner that reflects the nature and complexity of the undertaking and its effects on historic properties per 36 CFR § 800.2(d). The National Historic Preservation Act also requires that federal agencies consult with any Indian tribe and/or Tribal Historic Preservation Officer (THPO) that attach religious and cultural significance to historic properties that may be affected by the agency's undertakings per 36 CFR § 800.2(c)(2)(ii).

The State Historic Preservation Office is not the office of record for this undertaking. You are therefore asked to maintain a copy of this letter with your environmental review record for this undertaking.

If you have any questions, please contact Brian Grennell, Cultural Resource Management Coordinator, at 517-335-2721 or by email at GrennellB@michigan.gov. Please reference our project number in all communication with this office regarding this undertaking. Thank you for this opportunity to review and comment, and for your cooperation.

Sincerely.

Brian G. Grennell

Cultural Resource Management Coordinator

BGG:MJH:drt

Copy: Peter M. Tierney, Fleis & VandenBrink

Brandon Gabler, Commonwealth Heritage Group, Inc.





#### **United States Department of Agriculture**

#### June 1, 2021

SUBJECT: SHPO ER21-587 Village of Shelby Water Main Extension; Oceana County Section 106 Historic Review & Tribal Coordination

TO: Kelli Mosteller, Citizen Potawatomi Nation

Rhonda Hayworth, Ottawa Tribe of Oklahoma

Earl Meshiguad, Hannahville Indian Community

Kade Ferris & Darrel Seki, Red Lake Band of Chippewa Indians

Jonnie Sam, Little River Band of Ottawa Indians

Marcella Hadden, Saginaw Chippewa Indian Tribe

Paula Carrick, Bay Mills Indian Community

Daisy McGeshick, Lac Vieux Desert Band of Lake Superior Chippewa Indians

Alden Connor, Keweenaw Bay Indian Community

Marie R Richards, Sault Ste. Marie Tribe of Chippewa Indians

Cindy Winslow, Grand Traverse Band of Ottawa & Chippewa Indians

Melissa Wiatrolic, Little Traverse Bay Bands of Ottawa Indians

Sharon Detz, Grand River Band of Ottawa Indians

Douglas Taylor, Nottawaseppi Huron Band of Potawatomi

Matthew Bussler, Pokagon Band of Potawatomi Indians

Jill Hoppe, Fond du Lac Band Reservation

Amy Burnette, Leech Lake Band of Chippewa

Edith Leoso, Bad River Band of Lake Superior Chippewa

Rosemary Berens, Bois Forte Band of Chippewa

Michael LaRonge, Forest County Potawatomi

Norman DesChamps & Maryann Gagnon, Grant Portage Band of the Minnesota Chippewa Tribe

William Quackenbush, Ho-Chunk Nation of Wisconsin

Brian Bisonette, Lac Courte Oreilles Band of Lak Superior Chippewa Indians of Wisconsin

Melinda Young, Lac Du Flambeau Band of Lake Superior Chippewa

Lakota Pochedley, Match-e-be-nash-she-wish (Gun Lake) Band of Potawatomi Indians

Liana Onnen, Prairie Band of Potawatomi Nation

Noah White, Prairie Island Indian Community

Paul Barton, Seneca-Cayuga Nation

Larry Balber, Red Cliff Band

Chris McGeshick, Sokaogon Chippewa (Mole Lake) Community of Wisconsin

Wanda McFaggen, St. Croix Chippewa Indians of Wisconsin

Cayla Olson, White Earth Band of the Minnesota Chippewa Tribe

Diane Hunter, Miami Tribe of Oklahoma

Todd Moilanen, Mille Lacs Band of Ojibwe

David Grignon, Menominee Indian Tribe of Wisconsin

George Strack, Miami Nation

Larry Heady, Delaware Tribe of Indians

Under the authority of Section 106 of the National Historic Preservation Act of 1966, as amended, the State Historic Preservation Office (SHPO) has reviewed the above-mentioned project and concluded that:

- X No historic properties are affected by the project (36 CFR § 800.4 (d) (1)), or
- The project will have no adverse effect on historic properties (36 CFR § 800.5)

The project was initially reviewed by a third party archaeologist the meets the minimum federal professional qualifications set forth in 36 CFR Part 61. Further, the SHPO review of this project included a review by the Office of the State Archaeologist (OSA). The OSA review process includes looking at the presence and/or proximity of known archaeological sites near to and within the project area. To do this, they consider a variety of information, including the distribution of archaeological sites in the surrounding region, the amount of previous archaeological surveys in the vicinity and the results of that survey work, topography, surface water, soil types, the presence of old transportation features such as railroad grades and road beds, as well as other factors which may inform on the potential presence or absence of archaeological sites.



#### **United States Department of Agriculture**

As a standard requirement of all USDA Rural Development contracts, in the event that historic or archaeological resources are uncovered during excavation, the project engineer and USDA Rural Development will be immediately notified. Construction shall be temporarily halted pending the notification process and further directions issued by USDA Rural Development after coordination with the SHPO and interested tribes.

Based on the SHPO review and opinion, USDA Rural Development is issuing a finding as noted above for the above-mentioned project. If you have site specific information that causes your tribe to disagree with this opinion, please contact our office at (517) 324-5209 within sixty days.

Sincerely,

Andrew H. Granskog, PE State Environmental Coordinator

cc: USDA-RD Area Office; Martha MacFarlane-Faes--SHPO Environmental Review Coordinator

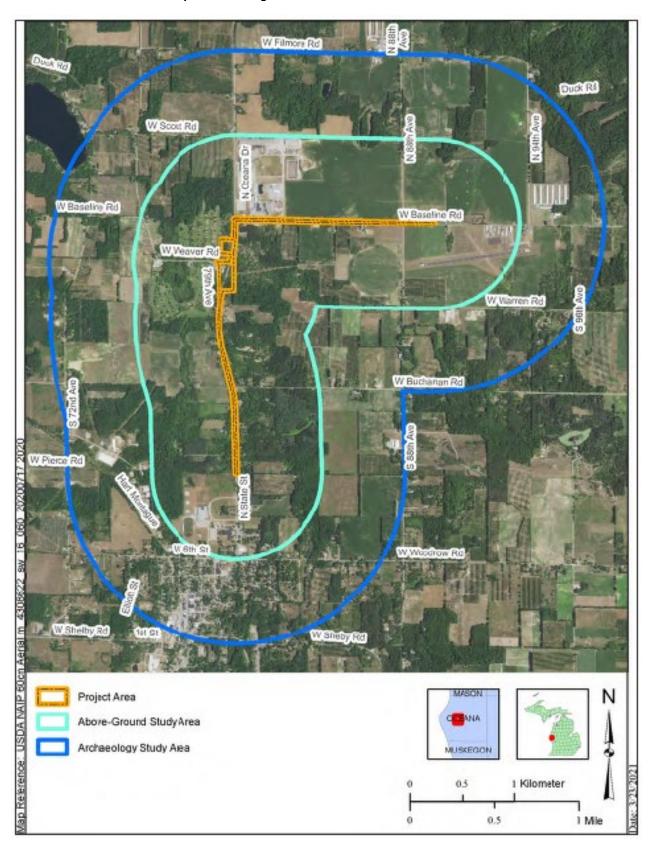
**Project Description:** 

The Project includes installing a 4.4-km-long (2.71-mi) water main extension from the Village of Shelby north into Shelby Township to Peterson Farms in order to connect nine apartment buildings to the Village of Shelby's water system. The water main extension will be in the right-of-way (ROW) but outside of the existing roadway. The project will also include a booster station near the intersection of West Weaver Road and 79th Avenue.

Project Map:



#### **United States Department of Agriculture**



3001 Coolidge Road • Suite 200 • East Lansing, MI 48823 Phone: (517) 324-5156 • Fax: (855) 813-7741 • TDD: (800) 649-3777• Web: http://www.rurdev.usda.gov/mi From: <u>Douglas Taylor</u>

To: <u>Granskog, Andy - RD, East Lansing, MI</u>

**Subject:** [EXTERNAL: Suspicious Link] Village of Shelby Water Main Extension

**Date:** Wednesday, June 2, 2021 11:16:28 AM

Attachments: <u>image001.png</u>

**CAUTION:** This message triggered warnings of **potentially** malicious web content. Consider whether you are expecting the message, along with inspection for suspicious links, prior to clicking. Any concerns with known senders, use a good contact method to verify.

Send Questions or Suspicious messages to: Spam.Abuse@usda.gov

Greetings,

Ref: Village of Shelby Water Main Extension

Thank you for including the Nottawaseppi Huron Band of the Potawatomi in your consultation process. From the description of your proposed project, it does not appear as if any cultural or religious concerns of the Tribe's will be affected. We therefore have no objection to the project. Of course, if the project scope is significantly changed or inadvertent findings are discovered during the course of the project, please contact us for further consultation.

Very Respectfully Douglas R. Taylor

Douglas R. Taylor | Tribal Historic Preservation Officer (THPO)

Pine Creek Indian Reservation 1301 T Drive S, Fulton, MI 49052

o: 269-704-8347 | c: 269-419-9434 | f: 269-729-5920 Douglas.Taylor@nhbp-nsn.gov | www.nhbp-nsn.gov



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### Miami Tribe of Oklahoma

3410 P St. NW, Miami, OK 74354 • P.O. Box 1326, Miami, OK 74355 Ph: (918) 541-1300 • Fax: (918) 542-7260 www.miamination.com



Via email: andy.granskog@usda.gov

June 18, 2021

Andrew H. Granskog, PE State Environmental Coordinator USDA Rural Development 3001 Coolidge Rd, Suite 200 East Lansing, MI 48823

Re: ER21-587, Village of Shelby Water Main Extension, Oceana County, Michigan – Comments of the Miami Tribe of Oklahoma

Dear Mr. Granskog,

Aya, kikwehsitoole – I show you respect. The Miami Tribe of Oklahoma, a federally recognized Indian tribe with a Constitution ratified in 1939 under the Oklahoma Indian Welfare Act of 1936, respectfully submits the following comments regarding ER21-587 in Oceana County, Michigan.

The Miami Tribe offers no objection to the above-referenced project at this time, as we are not currently aware of existing documentation directly linking a specific Miami cultural or historic site to the project site. However, given the Miami Tribe's deep and enduring relationship to its historic lands and cultural property within present-day Michigan, if any human remains or Native American cultural items falling under the Native American Graves Protection and Repatriation Act (NAGPRA) or archaeological evidence is discovered during any phase of this project, the Miami Tribe requests immediate consultation with the entity of jurisdiction for the location of discovery. In such a case, please contact me at 918-541-8966 or by email at dhunter@miamination.com to initiate consultation.

The Miami Tribe accepts the invitation to serve as a consulting party to the proposed project. In my capacity as Tribal Historic Preservation Officer I am the point of contact for consultation.

Respectfully,

Diane Hunter

Diane Hunter

Tribal Historic Preservation Officer

# 7.0 References

# 7.1 Project Narrative

# Village of Shelby Water System Improvements Project Narrative

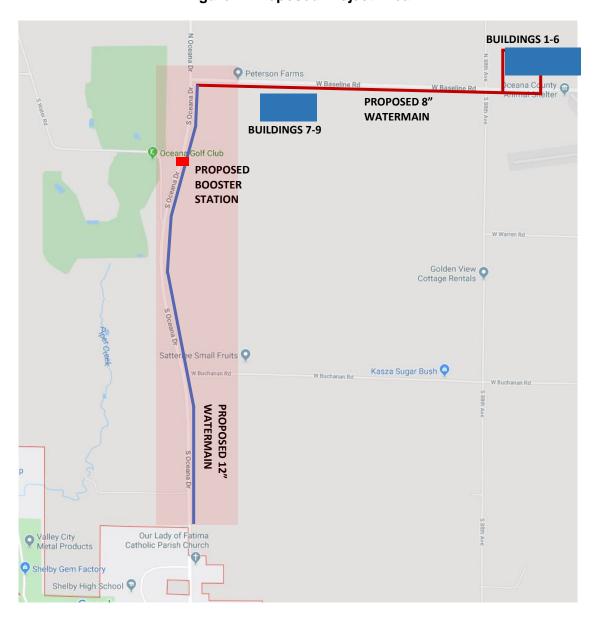
Peterson Farms, which is north of the Village of Shelby, currently owns a total of nine apartment buildings that have been recently constructed. Three (3) apartment buildings are near the intersection of Oceana Drive and Baseline Road and six (6) apartment buildings are at the northeast corner of 88<sup>th</sup> Avenue and Baseline Road. Currently, the apartment buildings use water from wells that were drilled for each building. Peterson Farms is seeking to connect to the Village of Shelby's water system and abandon their existing private well system, eliminating the risk off potential contamination.

The proposed project includes the following:

- Installing 8,800 feet of 12" ductile iron water main along Oceana Drive from the northern Village of Shelby Limits to Baseline Road.
- Installing 6,650 feet of 8" ductile iron water main along Baseline Road from Oceana Drive to 1,350 feet past 88th Avenue.
- Construction of a booster station and booster pumps on Oceana Drive approximately 1,000 feet south of the intersection between Oceana Drive and Baseline Road.

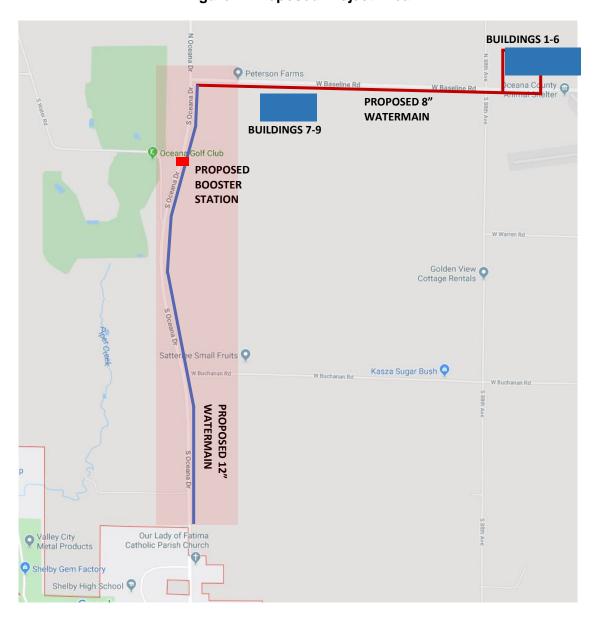
The above proposed improvements will add 52 residential equivalent unit (REU) to the water system, totaling 14,560 gpd for all nine (9) apartment buildings. **Figure 1** displays the location of the proposed project.


**Figure 1: Proposed Project Area** 




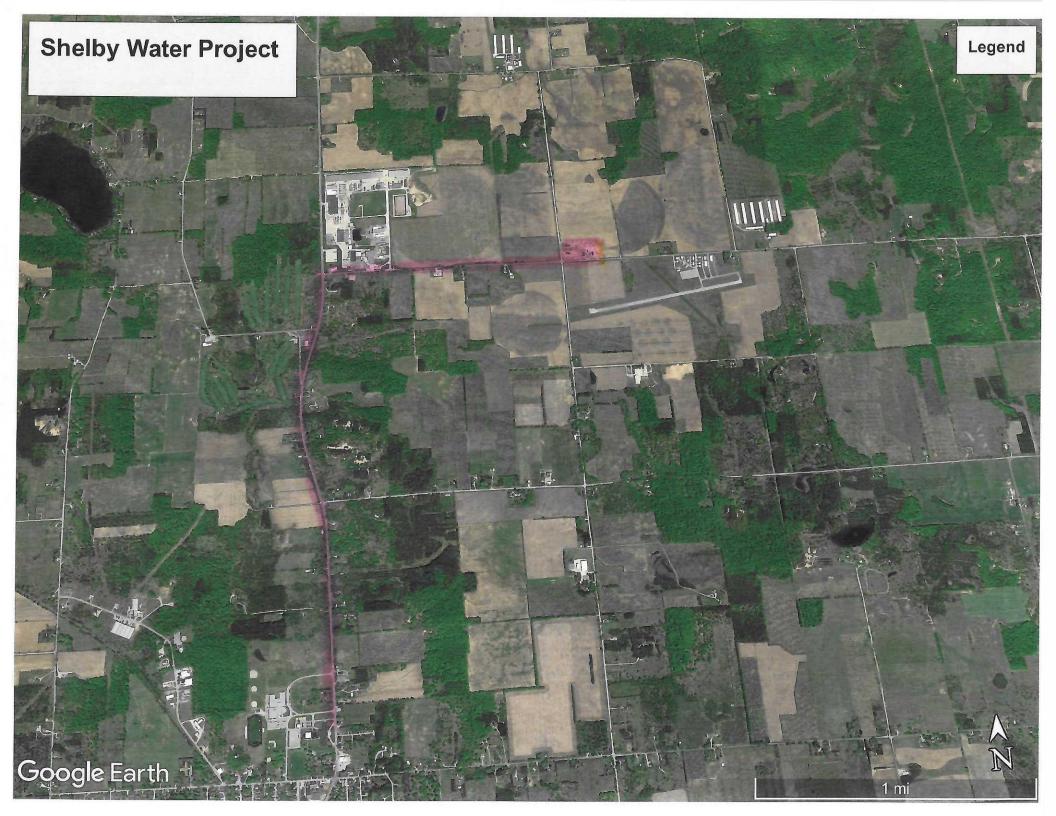
- 7.2 Street Map with Project Locations
- 7.3 Topographical Map
- 7.4 Aerial Map
- 7.5 Flood Insurance Rate Map
- 7.6 Flood Certificate
- 7.7 Wetlands Map
- 7.8 Air Quality: Nonattainment Area Map

**Figure 1: Proposed Project Area** 









# National Flood Hazard Layer FIRMette

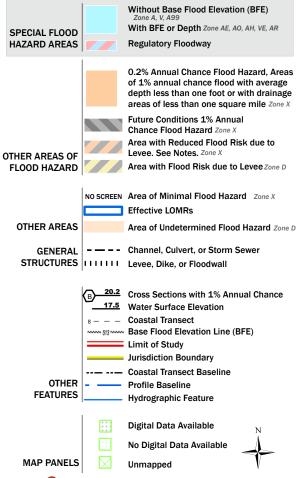


Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020



#### Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT



This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

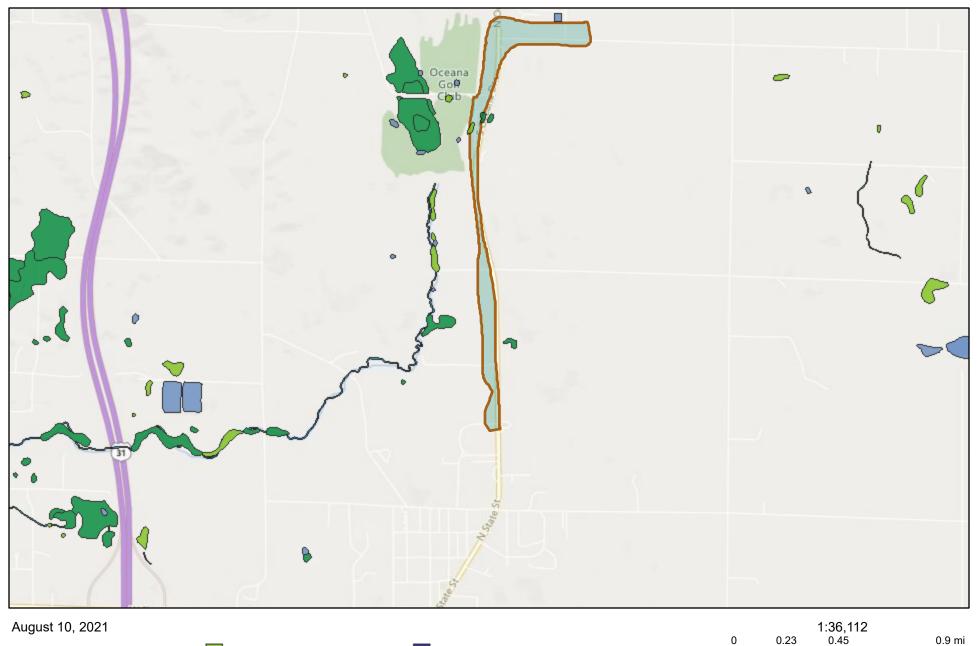
The pin displayed on the map is an approximate point selected by the user and does not represent

an authoritative property location.

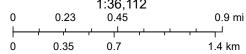
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 8/23/2021 at 9:17 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

# Shelby

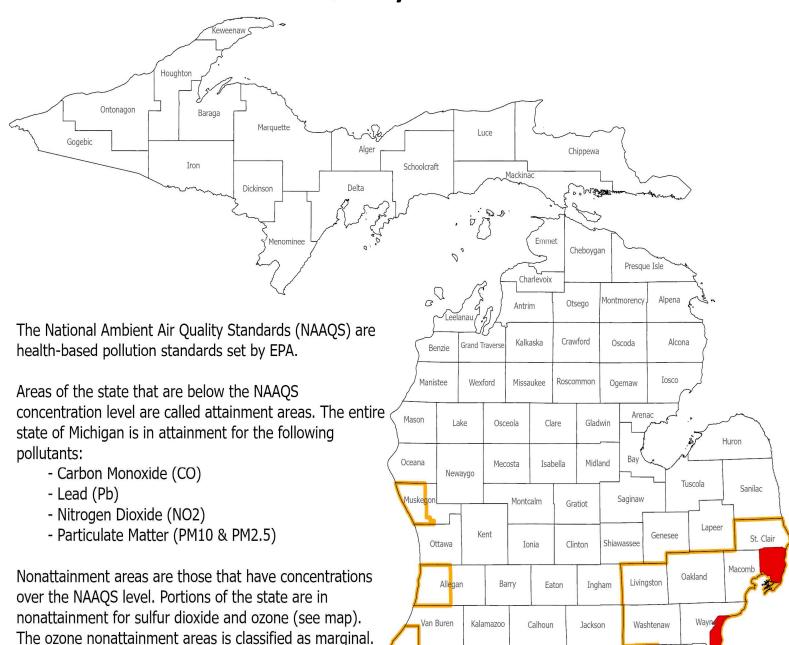






U.S. Fish and Wildlife Service, National Standards and Support Team, wetlands\_team@fws.gov, © 2021 Microsoft Corporation © 2021 TomTom

# Attainment Status for the National Ambient Air Quality Standards





Sulfur Dioxide Nonattainment Area

Ozone Nonattainment Area

See Page 2 for close-up maps of partial county nonattainment areas.

Lenawee

St Joseph

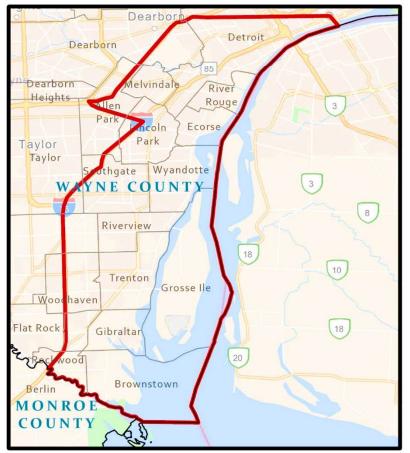
Branch

Hillsdale

# Close-Up Maps of Partial County Nonattainment Areas

# **Sulfur Dioxide Nonattainment Areas**

Wayne County Area



St. Clair County Area



# **Ozone Nonattainment Areas**

Allegan County Area



Muskegon County Area



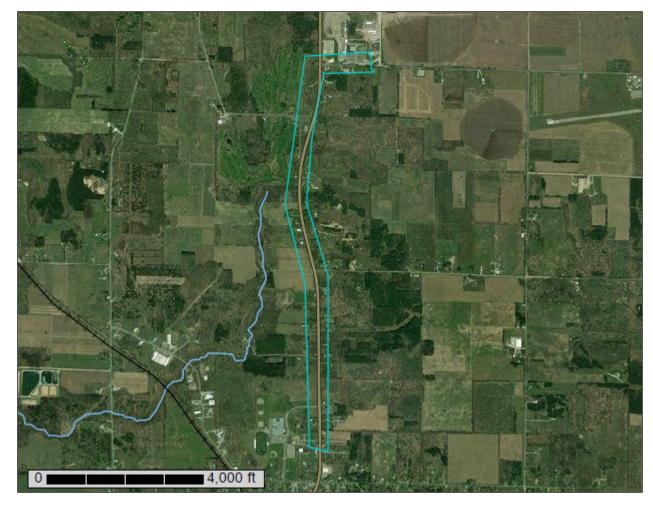
- 7.8.1 Soils Map
- 7.8.2 Prime and Other Important Farmlands



**NRCS** 

Natural Resources Conservation Service A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

# Custom Soil Resource Report for Oceana County, Michigan



# **Preface**

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2 053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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102C—Arkport-Chelsea complex, 6 to 12 percent slopes, lake	
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# **How Soil Surveys Are Made**

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

#### Custom Soil Resource Report

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

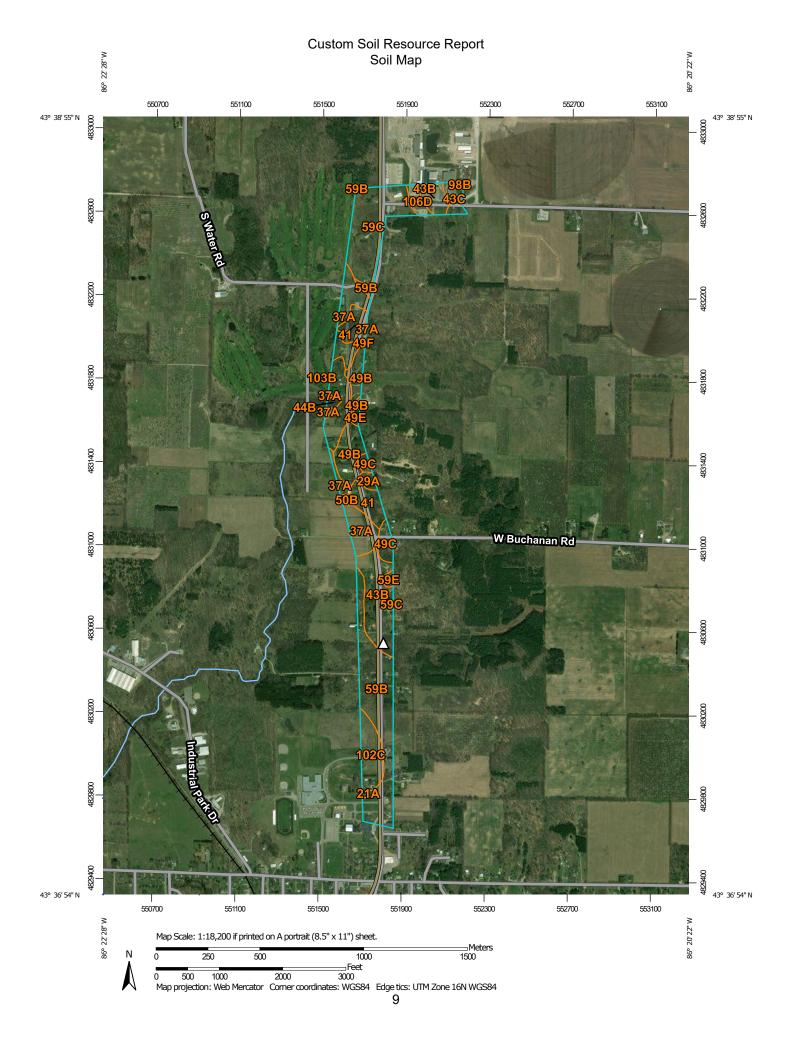
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

### Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

# Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.



#### MAP LEGEND

#### Area of Interest (AOI)

Area

Area of Interest (AOI)

#### Soils

Soil Map Unit Polygons

-

Soil Map Unit Lines

Soil Map Unit Points

#### **Special Point Features**

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

C Landfill
≜ Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

+ Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Spoil Area

٥

Stony Spot
Very Stony Spot

Ø

Wet Spot

Other

Δ

Special Line Features

#### Water Features

Streams and Canals

#### Transportation

+++ Rails

Interstate Highways

US Routes

Major Roads

Local Roads

#### Background

90

Aerial Photography

#### MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15.800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Oceana County, Michigan Survey Area Data: Version 15, Jun 2, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Dec 31, 2009—Nov 4, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

# **Map Unit Legend**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
21A	Freesoil loamy very fine sand, 0 to 3 percent slopes	0.5	0.3%
29A	Dixboro loamy very fine sand, 0 to 3 percent slopes	1.3	0.9%
37A	Altmar loamy fine sand, 0 to 3 percent slopes	16.8	12.2%
41	Granby mucky loamy sand, gravelly substratum	9.5	6.9%
43B	Spinks loamy fine sand, 0 to 6 percent slopes	19.1	13.9%
43C	Spinks loamy fine sand, 6 to 12 percent slopes	3.0	2.2%
44B	Thetford loamy fine sand, 0 to 4 percent slopes	0.7	0.5%
49B	Grattan sand, 0 to 6 percent slopes	8.1	5.9%
49C	Grattan sand, 6 to 18 percent slopes	7.4	5.4%
49E	Grattan sand, 18 to 35 percent slopes	0.6	0.5%
49F	Grattan sand, 35 to 70 percent slopes	0.3	0.2%
50B	Covert sand, 0 to 6 percent slopes	0.6	0.4%
59B	Benona sand, 0 to 6 percent slopes	28.4	20.6%
59C	Benona sand, 6 to 18 percent slopes	21.1	15.4%
59E	Benona sand, 18 to 35 percent slopes	0.8	0.6%
98B	Spinks-Scalley complex, 0 to 6 percent slopes	0.2	0.2%
102C	Arkport-Chelsea complex, 6 to 12 percent slopes, lake moderated	8.1	5.9%
103B	Spinks-Okee complex, 0 to 6 percent slopes, lake moderated	8.8	6.4%
106D	Spinks loamy fine sand, 12 to 18 percent slopes, lake moderated	2.3	1.7%
Totals for Area of Interest		137.6	100.0%

# **Map Unit Descriptions**

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas

shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

## **Oceana County, Michigan**

## 21A—Freesoil loamy very fine sand, 0 to 3 percent slopes

## **Map Unit Setting**

National map unit symbol: 6bmg Elevation: 50 to 1,500 feet

Mean annual precipitation: 28 to 44 inches Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 120 to 200 days

Farmland classification: Prime farmland if drained

## **Map Unit Composition**

Freesoil and similar soils: 90 percent Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

### **Description of Freesoil**

## Setting

Landform: Lake plains, deltas

Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear

Parent material: 7 to 38 inches of loamy material over stratified, calcareous loamy

glaciolacustrine deposits

#### Typical profile

H1 - 0 to 9 inches: loamy very fine sand H2 - 9 to 24 inches: loamy very fine sand

H3 - 24 to 60 inches: stratified fine sand to silty clay loam

## **Properties and qualities**

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches Drainage class: Somewhat poorly drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high

(0.57 to 1.98 in/hr)

Depth to water table: About 6 to 18 inches

Frequency of flooding: None Frequency of ponding: None

Calcium carbonate, maximum content: 20 percent Available water capacity: Moderate (about 8.3 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: B/D

Ecological site: F096XB017MI - Loamy Depression

Hydric soil rating: No

## **Minor Components**

#### **Arkport**

Percent of map unit: 3 percent

Landform: Lake plains, deltas

Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### Lamson

Percent of map unit: 3 percent

Landform: Depressions on deltas, depressions on lake plains

Landform position (three-dimensional): Talf

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: Yes

#### Chelsea

Percent of map unit: 2 percent Landform: Lake plains, deltas

Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### **Pipestone**

Percent of map unit: 2 percent Landform: Deltas, lake plains

Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

## 29A—Dixboro loamy very fine sand, 0 to 3 percent slopes

## **Map Unit Setting**

National map unit symbol: 6bp9 Elevation: 50 to 1.100 feet

Mean annual precipitation: 28 to 44 inches Mean annual air temperature: 45 to 50 degrees F

Frost-free period: 120 to 180 days

Farmland classification: Prime farmland if drained

#### **Map Unit Composition**

Dixboro and similar soils: 93 percent

Minor components: 7 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

### **Description of Dixboro**

#### Setting

Landform: Lake plains, deltas

Landform position (three-dimensional): Rise

Down-slope shape: Linear

Across-slope shape: Linear

*Parent material:* 24 to 44 inches of loamy material over over stratified, calcareous, loamy, sandy and silty glaciofluvial deposits

## **Typical profile**

H1 - 0 to 9 inches: loamy very fine sand H2 - 9 to 24 inches: loamy very fine sand

H3 - 24 to 60 inches: stratified fine sand to silt loam

#### **Properties and qualities**

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches Drainage class: Somewhat poorly drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high

(0.57 to 1.98 in/hr)

Depth to water table: About 12 to 24 inches

Frequency of flooding: None Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent Available water capacity: Moderate (about 8.8 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: B/D

Ecological site: F096XB023MI - Sandy Depression

Hydric soil rating: No

## **Minor Components**

#### Lamson

Percent of map unit: 3 percent

Landform: Depressions on lake plains, depressions on deltas

Landform position (three-dimensional): Talf

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: Yes

## **Pipestone**

Percent of map unit: 2 percent Landform: Deltas, lake plains

Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### Altmar

Percent of map unit: 2 percent Landform: Deltas, lake plains

Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

## 37A—Altmar loamy fine sand, 0 to 3 percent slopes

## **Map Unit Setting**

National map unit symbol: 6bph Elevation: 600 to 1,200 feet

Mean annual precipitation: 28 to 44 inches Mean annual air temperature: 45 to 54 degrees F

Frost-free period: 120 to 180 days

Farmland classification: Farmland of local importance

#### **Map Unit Composition**

Altmar and similar soils: 90 percent Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Altmar**

#### Setting

Landform: Valley trains, outwash plains Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear

Parent material: Sandy and gravelly glaciofluvial deposits

#### Typical profile

H1 - 0 to 9 inches: loamy fine sand H2 - 9 to 24 inches: loamy sand H3 - 24 to 60 inches: gravelly sand

## Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches Drainage class: Somewhat poorly drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95

in/hr)

Depth to water table: About 6 to 18 inches

Frequency of flooding: None Frequency of ponding: None

Available water capacity: Low (about 3.1 inches)

## Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: A/D

Ecological site: F096XB023MI - Sandy Depression

Hydric soil rating: No

#### **Minor Components**

#### Granby

Percent of map unit: 4 percent

Landform: Depressions on valley trains, depressions on outwash plains

Landform position (three-dimensional): Talf

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: Yes

#### Okee

Percent of map unit: 3 percent

Landform: Outwash plains, valley trains Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

### **Toogood**

Percent of map unit: 3 percent

Landform: Outwash plains, valley trains Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

## 41—Granby mucky loamy sand, gravelly substratum

#### Map Unit Setting

National map unit symbol: 6bpr Elevation: 600 to 1,000 feet

Mean annual precipitation: 28 to 36 inches
Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 120 to 170 days

Farmland classification: Farmland of local importance

### **Map Unit Composition**

Granby, gravelly substratum, and similar soils: 93 percent

Minor components: 7 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

## Description of Granby, Gravelly Substratum

#### Setting

Landform: Depressions on outwash plains Landform position (three-dimensional): Talf

Down-slope shape: Linear Across-slope shape: Linear

Parent material: Sandy glaciofluvial deposits

## Typical profile

H1 - 0 to 10 inches: mucky loamy sand

H2 - 10 to 28 inches: sand

H3 - 28 to 60 inches: gravelly sand

#### **Properties and qualities**

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Poorly drained Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95

to 19.98 in/hr)

Depth to water table: About 0 inches

Frequency of flooding: None Frequency of ponding: Frequent

Calcium carbonate, maximum content: 15 percent Available water capacity: Low (about 4.3 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 5w

Hydrologic Soil Group: A/D

Ecological site: F096XB024MI - Wet Sandy Depression

Hydric soil rating: Yes

### **Minor Components**

## **Pipestone**

Percent of map unit: 7 percent Landform: Outwash plains

Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

## 43B—Spinks loamy fine sand, 0 to 6 percent slopes

## **Map Unit Setting**

National map unit symbol: 2x2sv Elevation: 580 to 940 feet

Mean annual precipitation: 30 to 41 inches
Mean annual air temperature: 43 to 52 degrees F

Frost-free period: 140 to 230 days

Farmland classification: Farmland of local importance

#### **Map Unit Composition**

Spinks and similar soils: 92 percent Minor components: 8 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Spinks**

## Setting

Landform: Outwash terraces, outwash plains, moraines

Landform position (two-dimensional): Backslope, shoulder, summit

Landform position (three-dimensional): Head slope, side slope, interfluve, nose

slope

Down-slope shape: Linear, convex Across-slope shape: Linear, convex

Parent material: Sandy glaciofluvial deposits

## Typical profile

Ap - 0 to 9 inches: loamy fine sand Bw - 9 to 22 inches: loamy fine sand E and Bt - 22 to 57 inches: loamy sand

C - 57 to 80 inches: sand

## **Properties and qualities**

Slope: 0 to 6 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high

(1.42 to 14.17 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Calcium carbonate, maximum content: 20 percent Maximum salinity: Nonsaline (0.0 to 0.4 mmhos/cm)

Sodium adsorption ratio, maximum: 2.0

Available water capacity: Low (about 5.2 inches)

## Interpretive groups

Land capability classification (irrigated): 3s Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: A

Ecological site: F097XA004MI - Dry Sandy Lake Plain, F098XA013MI - Piney Dry

Sandy Drift Plains, F096XB019MI - Rich Sandy Drift

Hydric soil rating: No

## **Minor Components**

#### **Thetford**

Percent of map unit: 3 percent Landform: Moraines, outwash plains

Landform position (two-dimensional): Footslope, toeslope

Landform position (three-dimensional): Base slope

Down-slope shape: Linear, concave

Across-slope shape: Linear Hydric soil rating: No

#### **Brady**

Percent of map unit: 2 percent

Landform: Outwash terraces, outwash plains, moraines

Landform position (two-dimensional): Footslope Landform position (three-dimensional): Base slope

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### Gowdy

Percent of map unit: 2 percent

Landform: Moraines

Landform position (two-dimensional): Shoulder, summit, backslope Landform position (three-dimensional): Nose slope, interfluve, side slope

Down-slope shape: Convex

Across-slope shape: Linear, convex

Hydric soil rating: No

#### **Oshtemo**

Percent of map unit: 1 percent

Landform: Outwash terraces, outwash plains, moraines

Landform position (two-dimensional): Shoulder, summit, backslope

Landform position (three-dimensional): Interfluve, side slope, head slope, nose

slope

Down-slope shape: Linear, convex Across-slope shape: Linear, convex

Hydric soil rating: No

## 43C—Spinks loamy fine sand, 6 to 12 percent slopes

#### Map Unit Setting

National map unit symbol: 6bpy Elevation: 580 to 1,360 feet

Mean annual precipitation: 28 to 37 inches
Mean annual air temperature: 45 to 54 degrees F

Frost-free period: 120 to 175 days

Farmland classification: Farmland of local importance

#### **Map Unit Composition**

Spinks and similar soils: 93 percent Minor components: 7 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

## **Description of Spinks**

## Setting

Landform: Moraines

Landform position (two-dimensional): Summit, shoulder, backslope, footslope,

toeslope

Landform position (three-dimensional): Interfluve, head slope, nose slope, side

slope, base slope, crest Down-slope shape: Linear

Across-slope shape: Linear, convex

Parent material: Sandy glaciofluvial deposits and/or eolian deposits

#### Typical profile

H1 - 0 to 9 inches: loamy fine sand H2 - 9 to 24 inches: fine sand H3 - 24 to 60 inches: sand

#### **Properties and qualities**

Slope: 6 to 12 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95

in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Available water capacity: Low (about 4.2 inches)

## Interpretive groups

Land capability classification (irrigated): 3e Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: A

Ecological site: F096XB019MI - Rich Sandy Drift

Hydric soil rating: No

#### **Minor Components**

#### Benona

Percent of map unit: 2 percent

Landform: Moraines

Landform position (two-dimensional): Summit, shoulder, backslope, footslope,

toeslope

Landform position (three-dimensional): Interfluve, head slope, nose slope, side

slope, base slope, crest Down-slope shape: Linear

Across-slope shape: Linear, convex

Hydric soil rating: No

## Fern

Percent of map unit: 2 percent

Landform: Moraines

Landform position (two-dimensional): Summit, shoulder, backslope, footslope,

toeslope

Landform position (three-dimensional): Interfluve, head slope, nose slope, side

slope, base slope, crest Down-slope shape: Linear

Across-slope shape: Linear, convex

Hydric soil rating: No

#### Coloma

Percent of map unit: 2 percent

Landform: Moraines

Landform position (two-dimensional): Summit, shoulder, backslope, footslope,

toeslope

Landform position (three-dimensional): Interfluve, head slope, nose slope, side

slope, base slope, crest Down-slope shape: Linear

Across-slope shape: Linear, convex

Hydric soil rating: No

## Gowdy

Percent of map unit: 1 percent

Landform: Moraines

Landform position (two-dimensional): Summit, shoulder, backslope, footslope,

toeslope

Landform position (three-dimensional): Interfluve, head slope, nose slope, side

slope, base slope, crest Down-slope shape: Linear

Across-slope shape: Linear, convex

Hydric soil rating: No

## 44B—Thetford loamy fine sand, 0 to 4 percent slopes

### **Map Unit Setting**

National map unit symbol: 6bq1 Elevation: 600 to 1,500 feet

Mean annual precipitation: 28 to 37 inches Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 120 to 170 days

Farmland classification: Farmland of local importance

#### **Map Unit Composition**

Thetford and similar soils: 90 percent Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

## **Description of Thetford**

### Setting

Landform: Moraines, outwash plains

Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear

Parent material: Sandy glaciofluvial deposits and/or till

## **Typical profile**

H1 - 0 to 9 inches: loamy fine sand H2 - 9 to 24 inches: loamy fine sand

H3 - 24 to 54 inches: sand H4 - 54 to 60 inches: sand

#### **Properties and qualities**

Slope: 0 to 4 percent

Depth to restrictive feature: More than 80 inches Drainage class: Somewhat poorly drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95

in/hr)

Depth to water table: About 12 to 24 inches

Frequency of flooding: None Frequency of ponding: None

Available water capacity: Low (about 4.8 inches)

## Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: A/D

Ecological site: F096XB023MI - Sandy Depression

Hydric soil rating: No

#### **Minor Components**

## Granby

Percent of map unit: 3 percent

Landform: Depressions on outwash plains, depressions on moraines

Landform position (three-dimensional): Talf

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: Yes

### **Spinks**

Percent of map unit: 3 percent Landform: Outwash plains, moraines Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

## Chelsea

Percent of map unit: 2 percent Landform: Outwash plains, moraines Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

## **Pipestone**

Percent of map unit: 2 percent Landform: Outwash plains, moraines Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

## 49B—Grattan sand, 0 to 6 percent slopes

### Map Unit Setting

National map unit symbol: 2w64d Elevation: 580 to 1,150 feet

Mean annual precipitation: 30 to 41 inches
Mean annual air temperature: 43 to 52 degrees F

Frost-free period: 140 to 200 days

Farmland classification: Not prime farmland

#### **Map Unit Composition**

Grattan and similar soils: 95 percent Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

### **Description of Grattan**

#### Setting

Landform: Outwash plains, lake plains, moraines
Landform position (two-dimensional): Shoulder, summit

Landform position (three-dimensional): Interfluve, side slope, head slope, nose

slope, tread

Down-slope shape: Linear Across-slope shape: Linear Parent material: Sandy outwash

## **Typical profile**

A - 0 to 2 inches: sand E - 2 to 6 inches: sand Bs1 - 6 to 15 inches: sand Bs2 - 15 to 31 inches: sand BC - 31 to 42 inches: sand C - 42 to 80 inches: sand

## **Properties and qualities**

Slope: 0 to 6 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high

(1.42 to 14.17 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Sodium adsorption ratio, maximum: 1.0

Available water capacity: Low (about 4.0 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: A

Ecological site: F096XB019MI - Rich Sandy Drift, F094AA006MI - Snowy Sandy

Drift

Hydric soil rating: No

#### **Minor Components**

#### Tustin

Percent of map unit: 2 percent

Landform: Outwash plains, moraines, lake plains Landform position (two-dimensional): Summit, shoulder

Landform position (three-dimensional): Interfluve, side slope, tread

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### Covert

Percent of map unit: 1 percent

Landform: Outwash plains, lake plains, moraines Landform position (two-dimensional): Footslope Landform position (three-dimensional): Base slope

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

### Kingsville

Percent of map unit: 1 percent

Landform: Lake plains, moraines, outwash plains Landform position (two-dimensional): Toeslope Landform position (three-dimensional): Base slope

Down-slope shape: Linear, concave Across-slope shape: Linear, concave

Hydric soil rating: Yes

### **Pipestone**

Percent of map unit: 1 percent

Landform: Outwash plains, lake plains, moraines Landform position (two-dimensional): Footslope Landform position (three-dimensional): Base slope

Down-slope shape: Linear, concave

Across-slope shape: Linear Hydric soil rating: No

## 49C—Grattan sand, 6 to 18 percent slopes

#### **Map Unit Setting**

National map unit symbol: 2w64f Elevation: 580 to 1,160 feet

Mean annual precipitation: 30 to 41 inches Mean annual air temperature: 43 to 52 degrees F

Frost-free period: 140 to 200 days

Farmland classification: Not prime farmland

#### Map Unit Composition

Grattan and similar soils: 95 percent Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

### **Description of Grattan**

## Setting

Landform: Lake plains, outwash plains, moraines

Landform position (two-dimensional): Shoulder, backslope

Landform position (three-dimensional): Head slope, side slope, nose slope

Down-slope shape: Convex

Across-slope shape: Linear, concave

Parent material: Sandy drift

## **Typical profile**

A - 0 to 2 inches: sand E - 2 to 6 inches: sand Bs1 - 6 to 15 inches: sand Bs2 - 15 to 31 inches: sand BC - 31 to 42 inches: sand C - 42 to 80 inches: sand

## **Properties and qualities**

Slope: 6 to 18 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high

(1.42 to 14.17 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Sodium adsorption ratio, maximum: 1.0

Available water capacity: Low (about 4.0 inches)

### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: A

Ecological site: F096XB019MI - Rich Sandy Drift

Hydric soil rating: No

#### **Minor Components**

### **Spinks**

Percent of map unit: 3 percent

Landform: Outwash plains, moraines, lake plains

Landform position (two-dimensional): Shoulder, backslope

Landform position (three-dimensional): Head slope, side slope, nose slope

Down-slope shape: Convex

Across-slope shape: Linear, concave

Hydric soil rating: No

## **Pipestone**

Percent of map unit: 2 percent

Landform: Lake plains, outwash plains, moraines Landform position (two-dimensional): Footslope Landform position (three-dimensional): Base slope

Down-slope shape: Linear, concave

Across-slope shape: Linear Hydric soil rating: No

## 49E—Grattan sand, 18 to 35 percent slopes

## **Map Unit Setting**

National map unit symbol: 2w64k Elevation: 580 to 1,380 feet

Mean annual precipitation: 30 to 41 inches Mean annual air temperature: 43 to 52 degrees F

Frost-free period: 140 to 200 days

Farmland classification: Not prime farmland

#### **Map Unit Composition**

Grattan and similar soils: 95 percent Minor components: 5 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Grattan**

#### Setting

Landform: Lake plains, outwash plains, moraines Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Nose slope, side slope, head slope

Down-slope shape: Convex

Across-slope shape: Linear, concave

Parent material: Sandy drift

#### Typical profile

A - 0 to 2 inches: sand E - 2 to 6 inches: sand Bs1 - 6 to 15 inches: sand Bs2 - 15 to 31 inches: sand BC - 31 to 42 inches: sand C - 42 to 80 inches: sand

#### **Properties and qualities**

Slope: 18 to 35 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high

(1.42 to 14.17 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Maximum salinity: Nonsaline (0.0 to 1.9 mmhos/cm)

Sodium adsorption ratio, maximum: 1.0

Available water capacity: Low (about 4.0 inches)

## Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: A

Ecological site: F096XB019MI - Rich Sandy Drift, F094AA006MI - Snowy Sandy

Drift

Hydric soil rating: No

## **Minor Components**

#### **Spinks**

Percent of map unit: 3 percent

Landform: Outwash plains, moraines, lake plains Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Head slope, side slope, nose slope

Down-slope shape: Convex

Across-slope shape: Linear, concave

Hydric soil rating: No

#### Fern

Percent of map unit: 1 percent

Landform: Lake plains, outwash plains, moraines Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Nose slope, side slope, head slope

Down-slope shape: Convex

Across-slope shape: Linear, concave

Hydric soil rating: No

#### **Boyer**

Percent of map unit: 1 percent Landform: Outwash plains, moraines

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Nose slope, side slope, head slope

Down-slope shape: Convex

Across-slope shape: Linear, concave

Hydric soil rating: No

## 49F—Grattan sand, 35 to 70 percent slopes

#### Map Unit Setting

National map unit symbol: 6bqg Elevation: 600 to 1,200 feet

Mean annual precipitation: 29 to 37 inches Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 130 to 170 days

Farmland classification: Not prime farmland

#### **Map Unit Composition**

Grattan and similar soils: 97 percent Minor components: 3 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Grattan**

## Setting

Landform: Moraines

Landform position (two-dimensional): Summit, shoulder, backslope, footslope,

toeslope

Landform position (three-dimensional): Interfluve, head slope, nose slope, side

slope, base slope, crest

Down-slope shape: Linear, convex

Across-slope shape: Convex, concave

Parent material: Sandy glaciofluvial deposits

### **Typical profile**

H1 - 0 to 3 inches: sand H2 - 3 to 32 inches: sand H3 - 32 to 60 inches: sand

## **Properties and qualities**

Slope: 35 to 70 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95

to 19.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Available water capacity: Low (about 3.9 inches)

### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: A

Ecological site: F096XB019MI - Rich Sandy Drift

Hydric soil rating: No

### **Minor Components**

### **Spinks**

Percent of map unit: 3 percent

Landform: Moraines

Landform position (two-dimensional): Summit, shoulder, backslope, footslope,

toeslope

Landform position (three-dimensional): Interfluve, head slope, nose slope, side

slope, base slope, crest

Down-slope shape: Convex, linear

Across-slope shape: Concave, convex

Hydric soil rating: No

## 50B—Covert sand, 0 to 6 percent slopes

## **Map Unit Setting**

National map unit symbol: 6bqh Elevation: 600 to 1,150 feet

Mean annual precipitation: 28 to 40 inches Mean annual air temperature: 45 to 50 degrees F

Frost-free period: 120 to 170 days

Farmland classification: Not prime farmland

### Map Unit Composition

Covert and similar soils: 93 percent Minor components: 7 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Covert**

#### Setting

Landform: Outwash plains, lake plains Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear

Parent material: Sandy glaciofluvial deposits

#### Typical profile

H1 - 0 to 1 inches: sand H2 - 1 to 33 inches: sand H3 - 33 to 60 inches: sand

## Properties and qualities

Slope: 0 to 6 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95

to 19.98 in/hr)

Depth to water table: About 24 to 42 inches

Frequency of flooding: None Frequency of ponding: None

Available water capacity: Low (about 3.9 inches)

## Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: A

Ecological site: F096XB021MI - Acidic Sandy Depression

Hydric soil rating: No

#### **Minor Components**

#### **Pipestone**

Percent of map unit: 2 percent

Landform: Lake plains, outwash plains Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### Grattan

Percent of map unit: 1 percent

Landform: Outwash plains, lake plains Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### **Plainfield**

Percent of map unit: 1 percent

Landform: Outwash plains, lake plains Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### Granby

Percent of map unit: 1 percent

Landform: Depressions on outwash plains, depressions on lake plains

Landform position (three-dimensional): Talf

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: Yes

#### **Epworth**

Percent of map unit: 1 percent

Landform: Outwash plains, lake plains Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### Kingsville

Percent of map unit: 1 percent

Landform: Depressions on lake plains, depressions on outwash plains

Landform position (three-dimensional): Talf

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: Yes

## 59B—Benona sand, 0 to 6 percent slopes

## **Map Unit Setting**

National map unit symbol: 6bqv Elevation: 600 to 1,200 feet

Mean annual precipitation: 28 to 40 inches Mean annual air temperature: 45 to 50 degrees F

Frost-free period: 120 to 170 days

Farmland classification: Not prime farmland

### **Map Unit Composition**

Benona and similar soils: 90 percent Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Benona**

#### Setting

Landform: Lake plains, outwash plains, moraines Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear

Parent material: Sandy glaciofluvial deposits

#### Typical profile

H1 - 0 to 8 inches: sand H2 - 8 to 46 inches: sand H3 - 46 to 60 inches: sand

## Properties and qualities

Slope: 0 to 6 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95

to 19.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Available water capacity: Low (about 4.8 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4s

Hydrologic Soil Group: A

Ecological site: F096XB019MI - Rich Sandy Drift

Hydric soil rating: No

#### **Minor Components**

#### **Spinks**

Percent of map unit: 3 percent

Landform: Moraines, lake plains, outwash plains Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### Covert

Percent of map unit: 3 percent

Landform: Lake plains, outwash plains, moraines Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

## **Pipestone**

Percent of map unit: 2 percent

Landform: Lake plains, outwash plains, moraines Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### Granby

Percent of map unit: 2 percent

Landform: Depressions on moraines, depressions on lake plains, depressions on

outwash plains

Landform position (three-dimensional): Talf

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: Yes

## 59C—Benona sand, 6 to 18 percent slopes

## **Map Unit Setting**

National map unit symbol: 6bqw Elevation: 600 to 1,200 feet

Mean annual precipitation: 29 to 37 inches Mean annual air temperature: 45 to 50 degrees F

Frost-free period: 120 to 170 days

Farmland classification: Not prime farmland

#### Map Unit Composition

Benona and similar soils: 93 percent Minor components: 7 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Benona**

#### Setting

Landform: Lake plains, outwash plains, moraines

Landform position (two-dimensional): Summit, shoulder, backslope, footslope,

toeslope

Landform position (three-dimensional): Interfluve, head slope, nose slope, side

slope, base slope, crest Down-slope shape: Linear

Across-slope shape: Linear, convex

Parent material: Sandy glaciofluvial deposits

### **Typical profile**

H1 - 0 to 8 inches: sand H2 - 8 to 46 inches: sand H3 - 46 to 60 inches: sand

## **Properties and qualities**

Slope: 6 to 18 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95

to 19.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Available water capacity: Low (about 4.8 inches)

### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: A

Ecological site: F096XB019MI - Rich Sandy Drift

Hydric soil rating: No

### **Minor Components**

### **Spinks**

Percent of map unit: 7 percent

Landform: Moraines, lake plains, outwash plains

Landform position (two-dimensional): Summit, shoulder, backslope, footslope,

toeslope

Landform position (three-dimensional): Interfluve, head slope, nose slope, side

slope, base slope, crest Down-slope shape: Linear

Across-slope shape: Linear, convex

Hydric soil rating: No

## 59E—Benona sand, 18 to 35 percent slopes

## **Map Unit Setting**

National map unit symbol: 6bqx Elevation: 600 to 1,200 feet

Mean annual precipitation: 29 to 37 inches Mean annual air temperature: 45 to 50 degrees F

Frost-free period: 120 to 170 days

Farmland classification: Not prime farmland

### **Map Unit Composition**

Benona and similar soils: 97 percent Minor components: 3 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

#### **Description of Benona**

#### Setting

Landform: Moraines

Landform position (two-dimensional): Summit, shoulder, backslope, footslope,

toeslope

Landform position (three-dimensional): Interfluve, head slope, nose slope, side

slope, base slope, crest Down-slope shape: Convex, linear Across-slope shape: Concave, convex Parent material: Sandy glaciofluvial deposits

#### Typical profile

H1 - 0 to 8 inches: sand H2 - 8 to 46 inches: sand H3 - 46 to 60 inches: sand

#### **Properties and qualities**

Slope: 18 to 35 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95

to 19.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Available water capacity: Low (about 4.8 inches)

#### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 7s

Hydrologic Soil Group: A

Ecological site: F096XB019MI - Rich Sandy Drift

Hydric soil rating: No

#### **Minor Components**

#### **Spinks**

Percent of map unit: 3 percent

Landform: Moraines

Landform position (two-dimensional): Summit, shoulder, backslope, footslope,

toeslope

Landform position (three-dimensional): Interfluve, head slope, nose slope, side

slope, base slope, crest

Down-slope shape: Convex, linear

Across-slope shape: Concave, convex

Hydric soil rating: No

## 98B—Spinks-Scalley complex, 0 to 6 percent slopes

### **Map Unit Setting**

National map unit symbol: 6brz Elevation: 600 to 1,200 feet

Mean annual precipitation: 28 to 37 inches Mean annual air temperature: 45 to 50 degrees F

Frost-free period: 120 to 170 days

Farmland classification: Farmland of local importance

#### **Map Unit Composition**

Spinks and similar soils: 47 percent Scalley and similar soils: 40 percent Minor components: 13 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

## **Description of Spinks**

#### Setting

Landform: Moraines

Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear

Parent material: Sandy glaciofluvial deposits and/or eolian deposits

## **Typical profile**

H1 - 0 to 9 inches: loamy fine sand H2 - 9 to 24 inches: fine sand H3 - 24 to 60 inches: sand

#### **Properties and qualities**

Slope: 0 to 6 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95

in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Available water capacity: Low (about 4.2 inches)

## Interpretive groups

Land capability classification (irrigated): 3s Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: A

Ecological site: F096XB019MI - Rich Sandy Drift

Hydric soil rating: No

#### **Description of Scalley**

#### Setting

Landform: Moraines

Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear

Parent material: 22 to 40 inches of loamy material over sandy glaciofluvial

deposits

## **Typical profile**

H1 - 0 to 6 inches: fine sandy loam H2 - 6 to 22 inches: fine sandy loam H3 - 22 to 34 inches: clay loam H4 - 34 to 60 inches: sand

## Properties and qualities

Slope: 1 to 6 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20

to 0.57 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Available water capacity: Moderate (about 7.0 inches)

## Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2e

Hydrologic Soil Group: C

Ecological site: F096XB016MI - Loamy Till

Hydric soil rating: No

## **Minor Components**

## Capac

Percent of map unit: 5 percent

Landform: Moraines

Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### **Arkona**

Percent of map unit: 4 percent

Landform: Moraines

Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### Gowdy

Percent of map unit: 4 percent

Landform: Moraines

Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

## 102C—Arkport-Chelsea complex, 6 to 12 percent slopes, lake moderated

### **Map Unit Setting**

National map unit symbol: 2zdhn Elevation: 300 to 1,500 feet

Mean annual precipitation: 28 to 40 inches Mean annual air temperature: 46 to 50 degrees F

Frost-free period: 130 to 200 days

Farmland classification: Farmland of unique importance

### **Map Unit Composition**

Arkport and similar soils: 60 percent Chelsea and similar soils: 37 percent

Minor components: 3 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

## **Description of Arkport**

#### Setting

Landform: Deltas

Landform position (two-dimensional): Summit, shoulder, backslope, footslope,

toeslope

Landform position (three-dimensional): Base slope, crest, interfluve, head slope,

nose slope, side slope Down-slope shape: Linear

Across-slope shape: Linear, convex

Parent material: Sandy and loamy eolian deposits and/or glaciofluvial deposits

## **Typical profile**

H1 - 0 to 8 inches: loamy very fine sand H2 - 8 to 22 inches: loamy very fine sand H3 - 22 to 60 inches: very fine sand

#### **Properties and qualities**

Slope: 6 to 12 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained

Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95

in/hr`

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Calcium carbonate, maximum content: 1 percent Available water capacity: Low (about 5.7 inches)

### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3e

Hydrologic Soil Group: A

Ecological site: F096XB019MI - Rich Sandy Drift

Hydric soil rating: No

### **Description of Chelsea**

## Setting

Landform: Deltas

Landform position (two-dimensional): Toeslope, footslope, backslope, shoulder,

summit

Landform position (three-dimensional): Interfluve, head slope, nose slope, side

slope, base slope, crest Down-slope shape: Linear

Across-slope shape: Linear, convex Parent material: Sandy eolian deposits

#### Typical profile

H1 - 0 to 9 inches: fine sand H2 - 9 to 60 inches: fine sand

### **Properties and qualities**

Slope: 6 to 12 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Excessively drained

Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95

to 19.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Available water capacity: Low (about 4.2 inches)

## Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6s

Hydrologic Soil Group: A

Ecological site: F096XB019MI - Rich Sandy Drift

Hydric soil rating: No

#### **Minor Components**

#### Freesoil

Percent of map unit: 3 percent

Landform: Deltas

Landform position (two-dimensional): Footslope, toeslope Landform position (three-dimensional): Base slope

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

## 103B—Spinks-Okee complex, 0 to 6 percent slopes, lake moderated

#### **Map Unit Setting**

National map unit symbol: 2zdhq Elevation: 600 to 1,200 feet

Mean annual precipitation: 28 to 44 inches
Mean annual air temperature: 45 to 54 degrees F

Frost-free period: 120 to 180 days

Farmland classification: Farmland of unique importance

## **Map Unit Composition**

Spinks and similar soils: 50 percent Okee and similar soils: 30 percent Minor components: 20 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

## **Description of Spinks**

#### Settina

Landform: Moraines

Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear

Parent material: Sandy glaciofluvial deposits and/or eolian deposits

## Typical profile

H1 - 0 to 9 inches: loamy fine sand H2 - 9 to 24 inches: fine sand H3 - 24 to 60 inches: sand

#### **Properties and qualities**

Slope: 0 to 6 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained Runoff class: Negligible

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95

in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Available water capacity: Low (about 4.2 inches)

## Interpretive groups

Land capability classification (irrigated): 3s Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: A

Ecological site: F096XB019MI - Rich Sandy Drift

Hydric soil rating: No

### **Description of Okee**

#### Setting

Landform: Moraines

Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear

Parent material: 20 to 40 inches of sandy material over loamy till

### Typical profile

H1 - 0 to 3 inches: loamy sand H2 - 3 to 25 inches: loamy sand H3 - 25 to 33 inches: sandy loam H4 - 33 to 60 inches: very gravelly sand

### **Properties and qualities**

Slope: 1 to 6 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high

(0.57 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Calcium carbonate, maximum content: 10 percent Available water capacity: Moderate (about 6.1 inches)

### Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3s

Hydrologic Soil Group: A

Ecological site: F096XB019MI - Rich Sandy Drift

Hydric soil rating: No

## **Minor Components**

#### Remus

Percent of map unit: 5 percent

Landform: Moraines

Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### **Thetford**

Percent of map unit: 5 percent

Landform: Moraines

Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### **Altmar**

Percent of map unit: 5 percent

Landform: Moraines

Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

#### Benona

Percent of map unit: 5 percent

Landform: Moraines

Landform position (three-dimensional): Rise

Down-slope shape: Linear Across-slope shape: Linear Hydric soil rating: No

## 106D—Spinks loamy fine sand, 12 to 18 percent slopes, lake moderated

#### Map Unit Setting

National map unit symbol: 2zdhx Elevation: 580 to 1,360 feet

Mean annual precipitation: 28 to 37 inches Mean annual air temperature: 45 to 54 degrees F

Frost-free period: 120 to 175 days

Farmland classification: Farmland of unique importance

#### **Map Unit Composition**

Spinks and similar soils: 90 percent Minor components: 10 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

## **Description of Spinks**

#### Setting

Landform: Moraines

Landform position (two-dimensional): Summit, shoulder, backslope, footslope,

toeslope

Landform position (three-dimensional): Interfluve, head slope, nose slope, side

slope, base slope, crest

Down-slope shape: Convex, linear

Across-slope shape: Concave, convex

Parent material: Sandy glaciofluvial deposits and/or eolian deposits

#### Typical profile

H1 - 0 to 9 inches: loamy fine sand H2 - 9 to 24 inches: fine sand H3 - 24 to 60 inches: sand

#### **Properties and qualities**

Slope: 12 to 18 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Well drained Runoff class: Very low

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95

in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: None Frequency of ponding: None

Available water capacity: Low (about 4.2 inches)

## Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 4e

Hydrologic Soil Group: A

Ecological site: F096XB019MI - Rich Sandy Drift

Hydric soil rating: No

#### **Minor Components**

#### Coloma

Percent of map unit: 4 percent

Landform: Moraines

Landform position (two-dimensional): Summit, shoulder, backslope, footslope,

toeslope

Landform position (three-dimensional): Interfluve, head slope, nose slope, side

slope, base slope, crest

Down-slope shape: Convex, linear

Across-slope shape: Concave, convex

Hydric soil rating: No

## Fern

Percent of map unit: 3 percent

Landform: Moraines

Landform position (two-dimensional): Shoulder, backslope, footslope, toeslope,

summit

Landform position (three-dimensional): Interfluve, head slope, nose slope, side

slope, base slope, crest

Down-slope shape: Convex, linear

Across-slope shape: Concave, convex

Hydric soil rating: No

#### Benona

Percent of map unit: 3 percent

Landform: Moraines

Landform position (two-dimensional): Summit, shoulder, backslope, footslope,

toeslope

Landform position (three-dimensional): Interfluve, head slope, nose slope, side

slope, base slope, crest Down-slope shape: Convex, linear

Across-slope shape: Concave, convex Hydric soil rating: No

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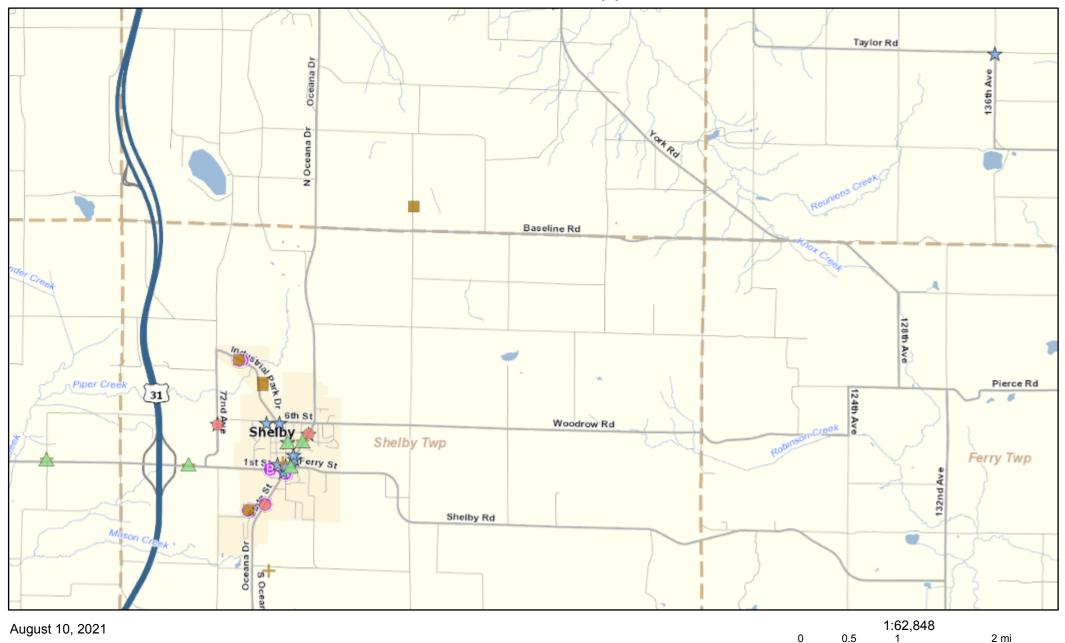
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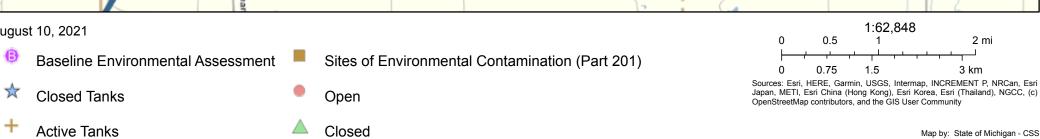
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7.9	Storage	Tanks an	d Sites of	f Environm	ental Conta	amination
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# **Environmental Mapper**





3 km

# 8.0 List of Preparers

Michigan Rural Community Assistance Program (RCAP).