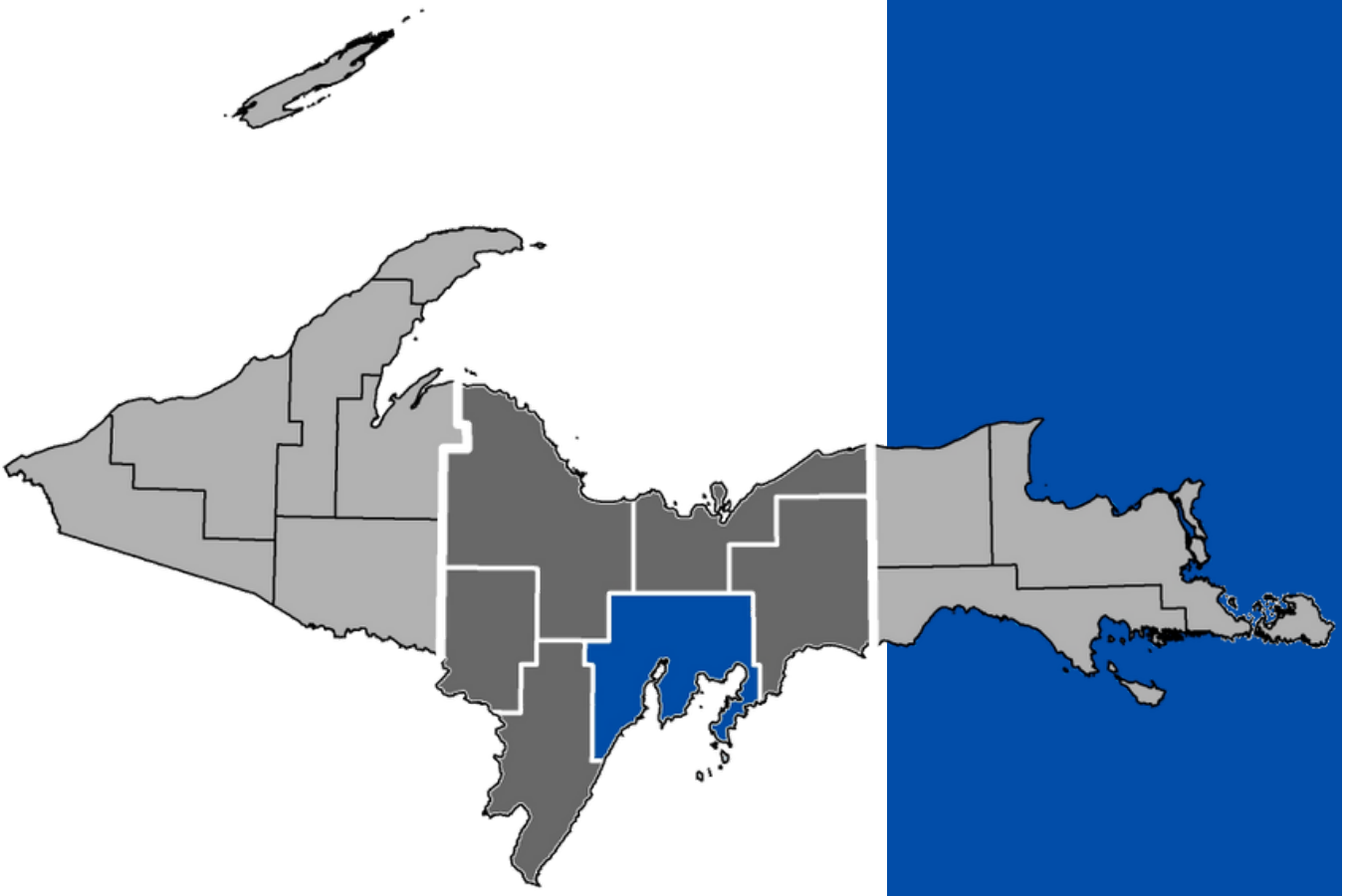
Delta County



Hazard Mitigation Plan - Update

2023

Prepared by:
Delta County Local Emergency Planning Committee (LEPC)
and
CUPPAD Regional Commission

FEMA Approved – February 1, 2023 - expires January 30, 2028

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1.0 INTRODUCTION

Hazard Mitigation is defined as any action taken before, during, or after a disaster to permanently eliminate or reduce the long-term risk to human life and property from natural and man-made hazards. Delta County has experienced various natural and man-made hazards such as a chlorine dioxide leak at the Billerud paper mill facility, the Stockyard wildland fire in the northern Stonington Peninsula and a water main break in the city of Escanaba. With a climate considered in the "banana belt" of the Upper Peninsula, Delta County often receives hazardous weather with sudden changes, especially in winter. A mix of developed and rural areas in the county makes ensuring the use of transportation infrastructure important to responding to emergent incidents.

Hazard mitigation planning is a process that assesses risks and evaluates the community vulnerability from potential hazards. Deficiencies are identified and strategies are developed that help mitigate problem areas. By developing an effective hazard mitigation plan a community can potentially reduce the effects of a future disaster. Potential effects of a disaster include loss of lives and property, environmental and economic concerns, and reduced essential services and quality of life. The result of this plan process is an Action Plan that identifies the appropriate steps to help mitigate present and future hazards.

Delta County's Board of Commissioners adopted a hazard mitigation plan on June 19, 2007. This document serves as the five-year mandatory review and update of the Delta County Hazard Mitigation Plan. The plan was last reviewed and approved by FEMA in 2015.

1.1 Background

The Federal Emergency Management Agency (FEMA) provides hazard mitigation assistance to state and local governments and to individuals through various federal programs. Mitigation Planning is authorized under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) (Public Law 93-288; 42 USC 5121 et seq.), as amended by the Disaster Mitigation Act of 2000; National Flood Insurance Act of 1968, as amended; and Water Infrastructure Improvements for the Nation (WIIN) Act of 2016. The Act provides a framework for linking pre-and post-disaster mitigation planning and initiatives with public and private interests to ensure an integrated, comprehensive approach to disaster loss reduction. It requires all local governments to have an approved hazard mitigation plan in place to be eligible to receive hazard mitigation project funding.

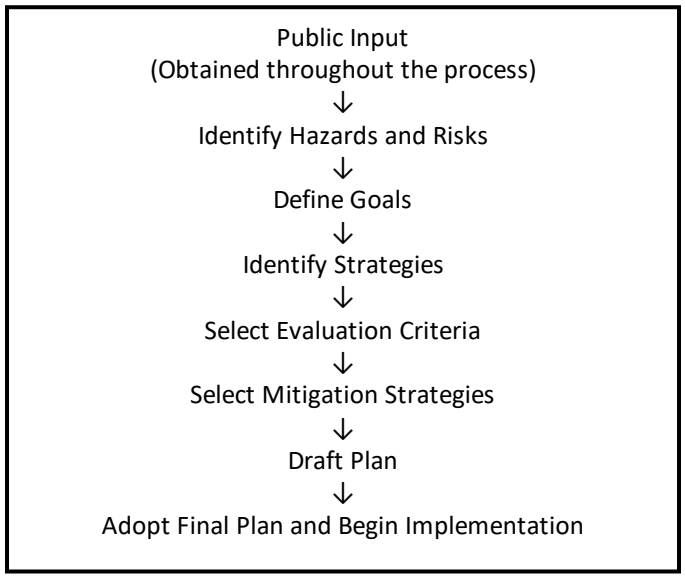
FEMA established project funding to develop local hazard mitigation plans. Part of these federal funds were allocated to the Michigan State Police/Emergency Management Division (MSP/EMD), which then re-granted funding to Michigan counties and major municipalities to develop local hazard mitigation plans. A hazard mitigation plan must be approved by FEMA for disasters declared after November 1, 2004.

Programs that provide federal assistance are: the Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance Program (FMAP), Pre-Disaster Mitigation Program (PDMP), and Building Resilient Infrastructure and Communities (BRIC). FEMA describes these grant programs in detail on their website and in publications.

1.2 Plan Process

The Delta County Hazard Mitigation Plan process was given guidance by FEMA requirements and the Michigan Department of State Police-Emergency Management Division (MSP/EMD) document – Pub 207, Local Hazard Mitigation Plan Workbook. Delta County utilized Central Upper Peninsula Planning and Development to update the plan's information and engage with stakeholders in positions of authority to regulate development. The plan process is outlined below:

Public Input is essential to the plan process in order to accurately understand the hazards faced by communities. Input into the plan was achieved through regular meetings and discussions with the County Local Emergency Planning Committee (LEPC), Emergency Management Coordinator, local officials, and various agency personnel. LEPC meetings occur regularly and are open to the public. The public was offered a review period through various means of communication and physical and digital locations in which to review and comment on the draft plan. Public participation takes place throughout the entire plan process and is described in more detail in Section 1.4.



The **hazards and risks** were identified through extensive research, meetings, surveys, and mapping. A community profile was first compiled to summarize the main components of the county and is explained in Chapter 2.0. Risks in the local units of government were described

under three hazard categories: natural, technological, and social. A workgroup then rated the individual hazards through a survey to determine a high, moderate or low level of risk. Chapter 3.0-Hazards-explains what went into the process and Table 3-1 shows the results.

The **goals and strategies** focus on the higher-risk hazards determined in part by the hazard identification process. The hazards addressed are transportation of hazardous materials, ice & sleet, snowstorms, severe wind, lighting & thunderstorms, hazardous materials at fixed sites and structural fires. Meetings and discussions with the LEPC, local officials, and agency personnel helped to suggest possible strategies to mitigate these hazards. Chapter 4.1 illustrates the issues, goals and strategies for each high-risk hazard.

The Emergency Management Coordinator and CUPPAD staff **selected evaluation criteria** to weight the possible mitigation strategies**.** In order to develop these criteria factors such as the effect of a hazard on large or small groups of people, recurring hazards, property damage, cost effectiveness, and natural resources. These criteria are further described in Chapter 4.2. A subcommittee of the LEPC used the criteria to assign points and "weight" the **mitigation strategies**; Table 4-3 shows the results.

The **adoption of the plan and implementation** of strategies are addressed in Chapter 5.0-Action Plan. Each strategy or action to be taken is listed along with responsible agency and possible funding source. This section also addresses future plan maintenance through evaluating, monitoring and participation in the plan.

1.3 Revisions

The original Delta County Hazard Mitigation Plan was updated with the adoption of the plan update in 2015 by the Delta County Board of Commissioners so area communities would remain eligible for FEMA funds. Demographic information and hazard event statistics were updated where new information was available. Hazards and the corresponding mitigation strategies were re-prioritized, and some new mitigation strategies were added to the Action Plan. The plan update followed the same overall plan and public participation process as the original hazard mitigation plan.

In 2018, CUPPAD engaged Delta County in participating in the plan update process. In 2021-22, the Delta County Hazard Mitigation Plan was updated after delays and the COVID-19 pandemic. Background, demographic, and hazard event statistics were updated where new information was available. Hazard rankings and corresponding mitigation strategies were discussed and updated with the local LEPC, and comments and strategies were solicited from local units government through means outlined in the following section. Information gathered was reviewed and used to revise the goals and strategies outlined in the plan, as well as develop new actions to accomplish hazard mitigation goals. CUPPAD staff reviewed and incorporated existing plans from local agencies and governments, statistical information from state and federal agency databases, relevant studies, reports, and technical information related to hazard

mitigation to update the plan's content. The update followed the same overall plan structure and public participation process as the previous hazard mitigation plans.

1.4 Governmental/Public Participation

Participation by local governmental bodies and agencies and the general public in hazard mitigation is both a crucial and required step in the plan process. Hazard mitigation is inherently a local issue. Therefore, local input about a community's risks can help in pinpointing projects to mitigate those risks. Additionally, FEMA requirements state that local jurisdictions that want to apply for federal mitigation funding must:

- Participate in the plan process
- Suggest potential projects
- Adopt the Hazard Mitigation Plan

Participation in the Delta County Hazard Mitigation Plan was achieved through several means. The following sections discuss ways in which both local governments and the public participated in the hazard mitigation process. Many of the jurisdictions within Delta County are continuing participants in the hazard mitigation planning process and local representatives and the public were engaged at several times throughout.

At the onset of the planning update process in October 2018, a letter was sent to engage the Delta County Board of Commissioners and Delta County Emergency Management in the plan update process. Both the County Board and Emergency Manager agreed to participate and help to engage local stakeholders in updating the plan. A copy of these communications can be found in Appendix G.

The Delta County Emergency Management Coordinator along with the Local Emergency Planning Committee (LEPC) gave regular plan guidance. A representative from CUPPAD was present at several LEPC meetings through 2021 and early 2022 and in regular communication with County Emergency Management. Throughout the planning process, the LEPC provided valuable assistance reviewing materials and offering suggestions for improvement. During numerous meetings held with the group, issues were brought forward for discussion, the committee assisted in the developing the vulnerability assessments of identified hazards in the county, ranking the hazards in order of importance, discussing, and developing strategies to respond to the identified hazards, and prioritizing the strategies. The committee meets bimonthly, with meetings open to the public. The LEPC membership and discussions on the hazard mitigation plan included the following community representatives:

- Delta County Board of Commissioners
- Delta County Administrator
- Delta County Clerk's Office
- Delta County Emergency Management Coordinator
- Delta County Sheriff's Office, Sheriff & Undersheriff

- Delta County Central Dispatch, 911 Operations Coordinator
- Delta County Emergency Medical Control Authority
- Michigan State Police, Emergency Management and Homeland Security Division, Region 8 District Coordinator
- Michigan State Police, Commander MSP-Gladstone Post
- Michigan Department of Health and Human Services, Delta County Director
- City of Escanaba, Water and Wastewater, Superintendent
- City of Escanaba, Electrical Department, Electric Utility Director
- City of Escanaba, Public Safety, Road Patrol and Fire Captain
- City of Gladstone, Public Safety Director
- Hannahville Indian Community Police Department, Police Chief
- Public Health, Delta & Menominee Counties, Emergency Preparedness Coordinator
- Alger-Delta Electrical Cooperative, General Manager
- OSF St. Francis Hospital Emergency Medicine
- American Red Cross, Disaster Team members
- Fresenius Medical Care, Area Team Lead
- UP Health Systems, Paramedic
- Bay College, EMT/Paramedic Instructor & Information Technology Director
- Guardian Flight, Program Director
- Delta-Schoolcraft Intermediate School District, Superintendent
- Billerud Paper (previously Verso), Environmental Health and Safety Manager
- Enbridge Energy, Manager, Area Operations

At meetings of the LEPC, supporting agencies and organization representatives were present at times to participate in discussions regarding hazard mitigation planning. These included representatives from:

- Salvation Army, Delta County
- Rampart EMS
- Plains Midstream
- Otwell Mawby Engineering
- OSF Healthcare, Community Relations Coordinator

2021-22 Plan Update Development

Meetings held with the Delta County LEPC and the topics of discussion are listed below.

Table 1-5
2021-22 Plan Update Development

May 20, 2021	LEPC Meeting: Reviewed planning process and draft hazard mitigation plan update with LEPC, distributed hazard ranking survey
July 15, 2021	LEPC Meeting: Reviewed planning process and draft hazard mitigation plan update with LEPC, discussed hazard rankings.

August 11, 2021	Worksheet sent to LEPC members to review and solicit mitigation strategies.
August 16, 2021	Worksheet sent to LUGs to review LEPC hazard rankings and solicit mitigation strategies
August 17, 2021	Met with Emergency Management Coordinator to review hazards and identify information gaps
September 16, 2021	LEPC Meeting: Reviewed planning process and draft hazard mitigation plan update with LEPC
December 29, 2021	Draft copies of Hazard Mitigation Plan sent to LEPC members via email for review and feedback.
January 20, 2022	LEPC Meeting (no quorum): Reviewed draft plan feedback and communicated public review period.

A survey was distributed to LEPC members via email in May of 2021 to re-prioritize identified hazards and form a basis for the following strategy and action plan chapters. A table relating the surveyed and prioritized hazards is available in the hazard analysis chapter. A copy of the survey worksheet is available in Appendix G. LEPC members participating in the review included the Delta County Emergency Coordinator, County Administrator, County Board of Commissioners members, County Clerk, County Emergency Medical Control Authority, Alger-Delta Electric Cooperative General Manager, Public Health Delta & Menominee Counties Emergency Preparedness Coordinator, Gladstone Public Safety Director, Otwell Mawby Project Engineer, Escanaba Electrical Department Director, Escanaba Water and Wastewater Director, Escanaba Public Safety Captain, MDHHS Delta County Director, and Billerud (previously Verso) Environmental Manager. Feedback from the review was incorporated into the hazard analysis in Chapter 3 and mitigation strategy priorities in Chapters 4 and 5.

A worksheet was distributed to LEPC members via email in August 2021 to review the previous plan's mitigation strategies and solicit possible new strategies to be included in the plan update. A copy of this worksheet is available in Appendix G. LEPC members offering feedback included the Delta County Emergency Management Coordinator, Delta County Sheriff, Billerud Environmental Health and Safety Coordinator and Environmental Manager, and Gladstone Public Safety Director. Feedback was incorporated in into the mitigation strategies included in Chapter 4.

A letter was sent to representatives of all Delta County jurisdictions on August 16, 2021 to solicit additional feedback on hazard priorities within Delta County, identify areas of concern and hazard occurrence within individual jurisdictions, and offer new mitigation strategies. A copy of this letter is available in Appendix G. Feedback was received via returned worksheets from the Baldwin Township Board, Brampton Township Supervisor, Wells Township Supervisor, and a phone conversation with the Bay de Noc Township Supervisor.

A mailed letter sent on January 3, 2022 at the beginning of the public review period solicited local units of government for feedback on the draft plan. An additional letter seeking feedback

from local units of government on the included final draft of the plan was sent on September 9, 2022. As a result of these processes, the following Delta County jurisdictions were continuing participants in the plan update.

Participating Delta County Jurisdictions	
JURISDICTION	**ACTIONS/COMMENTS/CONCERNS**
Baldwin Township	Received hazard survey feedback via mail from Township Board: no additional comments Township Supervisor reviewed final plan draft with some general information updates.
Bay de Noc Township	Phone conversation with Township Supervisor in response to hazard survey: no additional comments
Brampton Township	Received hazard survey feedback via mail from Township Supervisor: Identified transportation of hazardous materials as a particular concern in the jurisdiction. Township Supervisor reviewed final plan draft with no additional comments.
Ensign Township	A Trustee on behalf of the Township Board reviewed the final plan draft with no additional comments.
City of Escanaba	City officials from the Public Safety, Electrical, and Water and Wastewater departments participated in hazard mitigation planning discussions during LEPC meetings.
Fairbanks Township	Township Supervisor reviewed final plan draft with some general information updates.
Ford River Township	Township Supervisor reviewed final plan draft and supplied an additional mitigation action.
Garden Township	Township Board membership reviewed the final plan draft with no additional comments at a regular meeting.
City of Gladstone	The Director of Public Safety participated in hazard mitigation planning discussions during LEPC meetings. The Director of Public Safety reviewed final plan draft on the City's behalf with no additional feedback.
Wells Township	Received hazard survey feedback via mail from Township Supervisor: no additional comments.

Public review of updates to the Delta County Hazard Mitigation Plan was achieved through the following ways:

- LEPC members were informed of the public review period and were asked to communicate the availability of the drafts to their organizations and constituents via email and at the December 29, 2021 and January 20, 2022 meetings.

- A letter sent on January 10, 2022 notified Delta County local governments and stakeholders that a physical copy of the draft plan was available for review at the Escanaba Public Library, Delta County Clerk's Office, Delta County Emergency Management Office, and digitally on the CUPPAD Regional Commission website: www.cuppad.org. A copy of this letter and post on the CUPPAD website is available in Appendix G.

- A copy of the draft plan was made available for public review at the Escanaba Public Library, Delta County Clerk's Office, and Delta County Emergency Management office beginning January 17, 2022 through February 14. A copy of the letter that directed communication regarding the plan and was included with each public review copy is available in Appendix G.

- A notice was printed in the local newspaper, The Daily Press, on January 18, 2022 with information on where local residents could review the draft plan. A copy of this notice is available in Appendix G.

- A televised interview segment aired on January 26, 2022 on WJMN-TV Channel 3 News in Marquette, and an accompanying news article was posted on January 27 on the channel's website: https://www.upmatters.com/ and its social media. A link to the interview and article is here: https://www.upmatters.com/news/local-news/public-input-requested-from-residents-in-four-u-p-counties-for-hazard-mitigation-plans/. CUPPAD posted the interview and article to its social media site. A copy of the article and social media post is available in Appendix G.

- Neighboring jurisdictions had the opportunity to review and comment on the draft plan through communication of the public review period in local newspapers, television, the CUPPAD website, and verbal communications with other county LEPCs and Emergency Managers.

No responses were received from the public in Delta County as a result of these methods. One response was received from a resident outside of Delta County via email in May of 2022.

2.0 COMMUNITY PROFILE

2.1 Overview

Delta County is most often associated with Big and Little Bays de Noc, the northernmost fingers of Lake Michigan. Lake Michigan shoreline in Delta County totals more than 200 miles. Most of the 36,000 inhabitants are concentrated in the Gladstone-Escanaba urban corridor. Roughly, 40 percent of the county's 1,170 square miles are publicly owned. Largely, the county's economy is natural resource based with the Billerud Escanaba Paper Mill facility being the most prominent. Wood products, machine parts, packaging materials and logging equipment are among the many products manufactured in the county. Water access and many recreational opportunities have created a strong tourist industry. Escanaba is the county seat, a deep-water port, and home of Bay de Noc Community College.

Maps 1 and 2 provide locational, distance and comparative population and area information. Map 3 illustrates the types of land cover within Delta County.

2.1.1 Local Governmental Units

All local government jurisdictions are included in this Plan. Local governments in the county include fourteen townships, one village and two cities. The City of Escanaba is the county seat and population center. A more detailed description of each community and relevant statistics can be found in Appendix A.

Cities:

- Escanaba
- Gladstone

Townships:

- Baldwin
- Bark River
- Bay de Noc
- Brampton
- Cornell
- Ensign
- Escanaba
- Fairbanks
- Ford River
- Garden
- Masonville
- Maple Ridge
- Nahma
- Wells

Villages:

- Garden

2.2 Geography

Delta County borders Menominee, Marquette, Alger, and Schoolcraft counties. The balance of the county border is defined by 235 miles of Lake Michigan shoreline that provides some of the most diverse coastal resources in the entire Great Lakes region.

The combined length of county streams and rivers is about 700 miles. Most of the county's inland lakes are in the northeast part. Moss and Round Lakes are the largest inland water bodies; the Escanaba, Whitefish, Ford, and Sturgeon Rivers are the major river systems.

Portions of the Whitefish and Sturgeon Rivers are included in the National Wild and Scenic River Act designations.

The elevation within the county ranges from 582 feet along the Lake Michigan shoreline to areas just over 1,100 feet in the northwestern parts of the county (Map 4). Official elevations at the Delta County and West Gladstone airports are 609 feet and 720 feet, respectively.

Much of the land area includes shallow soils and wetland areas, which are environmental factors that hinder development. Using the state land cover classification system, wetlands are found over about a third of the county. Forests cover about three-fourths of the county. Much of this forested land is in public ownership, such as the Hiawatha National Forest and Escanaba River State Forest.

Maps numbered 3, 5, and 6 illustrate landcover, watersheds, and floodplains and high risk erosion areas.

2.3 Climate

July is the warmest month, January the coldest. Daily maximum and minimum July temperature averages recorded at Escanaba are 74.9 and 57.9 degrees respectively (Fahrenheit scale). The maximum daily average in January is 23.8 degrees while the minimum daily average is 8.5 degrees. Average July and January temperatures are 66.4 and 16.1 degrees respectively. High and low temperatures are greater at inland locations where the moderating influence of Lake Michigan is less. The growing season, or frost-free period, averaged 152 days during the 1951-1980 period. Generally, though, it is considered to be shorter, extending from mid-May to mid-September.

July is the wettest month, averaging 3.35 inches of precipitation. February is the driest, averaging 0.94 inches. Average snowfall in the Escanaba area from the winters of 1991-92 to 2012-13 was 55.26 inches. Over the most recent 10-year period (2003-04 to 2012-13), snowfall has averaged 55.34 inches. The greatest snowfall amounts occur in December and January. Although measurement data are not available, northern parts of the county typically receive more snowfall.

Afternoon thunderstorms are common during summer months and take place an average of 30 days per year. Although tornadic activity has been recorded, it is infrequent since the county lies north of the Midwest tornado belt. There were two funnel cloud sightings and one tornado during a 2005- 2012 eight year period. An EF-1 tornado in 2020 caused $150,000 in property damage to a storage unit facility.

2.4 Community Facilities and Organizations

Table 2-1 lists major agency and organization service providers within the county. Information is provided about local education agencies in Table 2-2 and text. Public school locations are identified on Table 3-9. Major facilities in the Escanaba and Gladstone areas as well as the non-urban areas of Delta County are identified on Table 3-9.

Table 2-1 Community Agencies and Organizations, Delta County	
Name	Service/Function
American Red Cross of Northeast Wisconsin	disaster relief and training
*ARES/RACES	emergency communications
Salvation Army	emergency food and shelter
St. Vincent de Paul	emergency food and shelter
Department of Human Services	human services
Pathways To Healthy Living	health and counseling services
Michigan Works!	employment and training assistance
Lakestate Industry, Inc.	employment and training assistance
MSU Extension Service	family and community services
Delta County Road Commission	road maintenance, snow removal
Delta Solid Waste Authority	landfill operation
Delta Area Transit Authority	public transportation
Delta County Area Chamber of Commerce	economic promotion and development
Delta County Economic Alliance	economic promotion and development
Public Health, Delta & Menominee Counties	public health
*USDA Farm Service Agency	agricultural disaster assistance
*USDA Natural Resources Conservation Service	natural resources management
*USDA Forest Service	national forest management
USDA Rural Development	development assistance programs
U.S. Postal Service	mail service through Bark River (49807), Cooks (49817), Cornell (49818), Escanaba (49829), Garden (49835), Gladstone (49837), Manistique (49854) Nahma (49864), Perkins (49872), Rock (49880), Wells (49894), Wetmore (49895).
Michigan Small Business Development Center, Upper Peninsula Region	small business counseling services
CUPPAD Regional Commission	local government assistance
UPCAP Services, Inc.	2-1-1 call center, elderly, housing, and conflict resolution services

*USDA: United States Department of Agriculture; ARES/RACES: Amateur Radio Emergency Service/Radio Amateur Civil Emergency Service

Elementary and Secondary Schools

Table 2-2 Public and Private Schools, Delta County		
School District/ School Buildings	Location	Type/Grades
Escanaba Area Public Schools • Junior/Senior High • Upper Elementary • Lemmer Elementary • Webster Kindergarten Center • Student Success Center	Escanaba	Public, K-12 6-8, 9-12 3,-5 1-2 K 8-12
Gladstone Area Public Schools • High School • Middle School • James T. Jones Elementary • W.C. Cameron Elementary	Gladstone	Public, K-12 9-12 6-8 3-5 K-2
Bark River-Harris School District	Harris (Menominee County)	Public, K-12
Mid Peninsula School District	St. Nicholas	Public, K-12
Rapid River Public Schools	Rapid River	Public, K-12
Big Bay de Noc School	Garden Corners	Public, K-12
Bay Middle College (at Bay College)	Escanaba	Public, 9-12
Holy Name Catholic School (K-10, 11-12 beginning Fall 2021)	Escanaba	Private, K-12
Escanaba SDA Christian School	Escanaba	Private, 1-8
Delta-Schoolcraft Intermediate School District	Escanaba	Public, PK-12

Vocational Schools

Career and technical education for high school students is provided by the Delta-Schoolcraft ISD at its Escanaba facility.

Early Childhood Programming

Early childhood programming, including Headstart, is provided by the Menominee-Delta-Schoolcraft Community Action Agency. Centers are located in Rapid River, Gladstone, and Escanaba.

Post-Secondary Schools

Bay de Noc Community College in Escanaba offers vocational, technical, certificate and many associate degree programs. Bachelor degree programs can be completed at the college's University Center in partnership with Lake Superior State University.

2.4.1 Critical Services

Hospital and Emergency Medical Services

OSF St. Francis Hospital in Escanaba is a critical access 25-bed facility that can expand to 50 beds for emergency operations. Services include a 24-hour emergency room. The hospital was constructed at its present location in 1986 and has been expanded several times to provide additional medical services and offices.

Other hospitals in the region are Marquette General (Marquette, MI), Schoolcraft Memorial (Manistique, MI), Bay Area Medical Center (Marinette, WI), Munising Memorial (Munising, MI), Dickinson County Memorial (Iron Mountain, MI), and Veterans Administration Medical Center (Iron Mountain, MI).

The Medical Control Authority, based out of OSF St. Francis, is the state-designated supervisor and coordinator of emergency medical services within the county. Emergency responders and their primary coverage areas are identified in Table 2-3. All services provide mutual aid to each other.

Table 2-3
Emergency Medical Responders, Delta County

Name and Location	Comments
Rampart EMS, Inc.	Advanced Life Support within the county; provides intercepts into neighboring counties
Masonville Township Volunteer Fire Department	Basic Life Support (non-transporting) for Masonville, Ensign and Bay de Noc Townships
Rock Community EMS	Basic Life Support for Maple Ridge, and Baldwin Townships and Turin Township in Marquette County
Tri-Star EMS	Basic Life Support for Nahma, Garden and Fairbanks Townships
AirMedCare Network/Guardian Flight	Air Ambulance Services for the Upper Peninsula

Public Health

Programs and services dealing with the prevention and control of disease and environmental health hazards are provided by Public Health, Delta & Menominee Counties through offices in Escanaba and Menominee.

Solid Waste

The Delta County landfill in Escanaba is licensed as a Type II facility. By ordinance, all residential and commercial waste generated in the county is disposed of at this landfill with the exception of that generated by Billerud. Billerud operates its own licensed Type III landfill in Escanaba Township. County waste collection is augmented by the licensed Big Bay de Noc Transfer Station near Garden.

Solid waste collection is accomplished through several private and public entities. The cities of Escanaba and Gladstone and the village of Garden provide municipal collection services. All other areas of the county use private collection providers.

Police and Fire Departments

Law enforcement agencies within the county include the Delta County Sheriff Department, Escanaba Public Safety Department, Gladstone Public Safety Department, and the Michigan State Police Post #84 in Gladstone. Force strength, coverage area, and types of services are shown in Table 2-4.

The E-911 center is operated as a department of Delta County, located in space at the Escanaba Public Safety Department. The Escanaba Public Safety Department has a drug detection dog that is used throughout the region.

The Delta County Sheriff Department staff operates the 156-bed county correctional facility. There are approximately 10 deputies assigned to road patrol. The Sheriff also has a search and rescue team comprised of local law enforcement officers and volunteers.

Table 2-4
Police Agencies, Delta County

Name	Area of Coverage	Estimated Agency Force	Comments
Delta County Sheriff	County	41 (includes all services, full and part-time (22 correctional officers) (10 road deputies)	road, marine and snowmobile patrol, jail operation and court services
Escanaba Public Safety Dept.	City	35	combined police and fire
Gladstone Public Safety Dept.	City	10 (20 volunteer fire)	combined police and fire
Michigan State Police Post #84	County	18 troopers 4 sergeants 2 detectives 1 post commander	Also provides coverage to Menominee and Schoolcraft County

All county fire departments listed in table 2-5 are signatory to a mutual fire aid agreement. Local public safety departments have thermal imaging cameras available to other departments. Some volunteer fire departments (VFD) are at the low end of the desired force size. Training and equipment needs for handling hazardous materials are of concern for emergency management and the fire departments.

Table 2-5 Fire Departments, Delta County		
Name	Area of Coverage	Agency Force (estimated)
Baldwin Township VFD	Baldwin	12
Bark River Township VFD	Bark River	20
Brampton Township VFD	Brampton	11
Cornell Township VFD	Cornell	10
Ensign Township VFD	Ensign	27
Escanaba Township VFD	Escanaba	30
Ford River Township VFD	Ford River	28
Garden Township VFD	Garden and Fairbanks	23
Masonville Township VFD	Masonville and Bay de Noc	20
Nahma Township VFD	Nahma	20
Tri-Township VFD	Maple Ridge; Turin and Ewing (Marquette Co.)	15
Escanaba PSD	City and Wells Township	32
Gladstone PSD	City	30 (includes 20 volunteers)

Additional firefighting assets and trained personnel are at the U.S. Forest Service facilities in Gladstone and Rapid River, and at the Michigan Department of Natural Resources facility in Gladstone.

Victim Services Unit

The Victim Services Unit is a volunteer group that provides assistance to public safety officials and the general community. They comfort victims, serve as a liaison between victims and emergency service providers, educate victims about their rights, and provide short term crisis intervention. Services are available to public safety departments throughout the county.

2.5 Culture and Community Profiles

The information that follows provides a brief description of community names that commonly appear on road maps. Some still have a resident population or perhaps commercial enterprises that give them a physical identity. Others existed during an earlier time and were abandoned as economic changes occurred.

Bark River: The community is composed of residential and commercial buildings on both sides of highway US-2 & 41 and the Canadian National Railroad that runs parallel to it. The

settlement includes several retail businesses, a bank and post office. Commercial establishments include a large feed mill and cement products manufacturer. A wastewater system serving the community is connected to the Hannahville Indian Community.

Brampton: This settlement was once a station along the C&NW Railroad line between Escanaba and Lake Superior communities.

Cornell: Cornell is located a short distance downstream from the Boney Falls dam. Now permanently closed or inactive, a road commission garage and trackage of the E&LS Railroad can be found in the community. A township hall, fire department and post office remain.

Ensign: This community settled as a station of the Minneapolis, St. Paul & Sault Ste. Marie Railroad 22 miles northeast of Escanaba. The general store, post office and sawmill are no longer in operation. A few homes and a small woodyard remain along highway US-2 and a railroad siding of the Canadian National Railroad, Wisconsin Central Division.

Escanaba: The city of Escanaba is the county's seat of government. The extensive lakeshore includes a major iron ore shipping facility, modern marina and large public park areas. Trunklines US-2/41 and M-35 converge in the city. The Canadian National and Escanaba and Lake Superior railroads provide service within and through the city.

Fairport: Fairport is an active commercial fishing village at the southern end of the Garden peninsula. The community supports a small year-round resident population, mostly along and near M-183 and county road 183.

Fayette: This former boomtown of the 1870s and 1880s has been largely restored from its ghost town status to a historic village by the state. The Jackson Iron Company built the town on Snail Shell Harbor to produce pig iron. The entire village is state-owned and is a major tourist attraction in the region.

Ford River: The community, located near the Ford River mouth, boomed during the logging era. Today it is marked by homes collected along the lakefront and M-35 from the Ford River Bridge to Portage Point. There are a few commercial establishments and a public boat launch facility on the river. A public water supply system is operated by the township that serves 192 customers.

Garden: The area in and around this community was settled by people of French descent. Its name is believed to have come from the presence of fertile soil. Incorporation as a village occurred in 1886. The village is the commercial center of the lightly populated Garden Peninsula.

Garden Corners: Designates the general area where highway US-2 and M-183 intersect. A few homes and hospitality-type businesses are found here.

Gladstone: Gladstone is the second largest population and commercial center in the county. Significant development in recent yeas has occurred at higher elevations (bluff) on the city's west side. The original settlement is located east of US-2, close to Little Bay de Noc.

Hyde: Hyde, with the Ford River nearby, served as the railroad station for the community of

Ford River located 6 miles south. A collection of homes and a small amount of commercial development is found along and near highway US-2/41.

Isabella: Settled in 1868 to supply charcoal for the furnace at Fayette, Isabella takes its name from the former queen of Castile in Spain. A few old buildings indicate that there once was a settlement. Today, scattered homes and old farm buildings remain. Highway US-2 and the Canadian National Railway, Wisconsin Central Division mainline and passing track are the major developmental features.

Lathrop: Settled in 1865, Lathrop was a station on the C&NW railroad. The settlement included over 100 residents, a post office and businesses generally associated with a village.

Masonville: Originally known as Gena and the first county seat of Delta County, the lakefront settlement of Masonville was named for Richard Mason. Mason came to the area in 1848 and established a sawmill that is believed to be the first steam operated plant in the Upper Peninsula. In addition to sawmill operations, nearby factories produced woodenware, hoops and staves. A significant number of residences are located in the general area.

Nahma: Nahma was established by the Big Bay De Noquette Lumber Company in 1881. The town was company headquarters for U.P. lumbering operations and featured clapboard homes, picket fences, community buildings, businesses and a main street whose lanes were separated by vegetation. When the company folded in 1951, the entire town was put up for sale. In its heyday, the town was inhabited by 1,000 workers and their families. The town has year-round inhabitants and many seasonal residents. Commercial enterprises include a restored hotel and restaurant and other tourist accommodations. A public water system operated by the township serves about 50 residences and businesses.

Nahma Junction: This describes the general area adjacent and near the junction of CR497, FFH13 and highway US-2. Several hospitality-related businesses, a few homes and the township fire hall are located here.

Perkins: Perkins is located along and near the intersection of highway M-35 and CR428. A collection of residences and commercial establishments identify the town area. The former township school now houses a wood furniture manufacturer. Baldwin township hall and fire department are a short distance from the intersection.

Rapid River: The community of Rapid River is located at the head of Little Bay de Noc and the confluence of three rivers. Settlement occurred in the late 1800s as several sawmills were operational. Highway US-2 and the Canadian National Railway traverse the community in an east-west direction. Highway US-41 intersects with US-2 on the west side of the community. The community has a variety of businesses and a concentration of residences. A public wastewater collection system pumps waste from the community to the Gladstone Wastewater Treatment Plant, a distance of six miles.

Rock: This community lies along the Canadian National Railroad and highway M-35. The intersection of CR432 and M-35 marks the center of the community. A public water system provides service to about 100 residences and businesses. A collection of residences and some commercial and industrial developments identify the town area.

Schaffer: Schaffer was settled in 1872 by French-Canadian farmers and lumberjacks along what

was to be a branch of the Chicago & Northwestern Railroad. Charles Schaffer constructed a battery of charcoal kilns along the rail stop in the town that was to bear his name. In 1910, the town had about 300 residents. A collection of homes, a large church, and a restaurant mark Schaffer today.

Stonington: Stonington was settled in 1897 by Scandinavian immigrants. It is reported to have reached a population peak of 750 in 1927 with fishing, farming and logging dominating the economy. Stonington today is characterized by scattered homes and cottages, a community hall, and a small grocery. The Peninsula Point lighthouse attracts many visitors each year.

2.6 Housing

The Census Bureau counted a total of 19,786 housing units in Delta County in 2020. Occupied housing units accounted for about 82 percent (16,290) of the total stock. Seventy-seven percent of these units were owner-occupied and had an average household size of 2.18 persons. Household size among renter-occupied units averaged 1.86 persons. Single-unit detached structures comprise 80 percent of the total housing units. Mobile homes make up 7.7 percent of all Delta County housing units.

The vacancy rate of rental units was 0.9 percent. An estimated 3,496 structures were identified as seasonal, recreational, or occasional use dwellings. In other words, 68.0 percent of the unoccupied housing units are cabins or cottages. Nearly one-third of the housing units in the following townships fall into this category: Bay de Noc (66.6%), Nahma (58.7%), Garden (46.3%), Fairbanks (55.8%), Cornell (38.7%), and Ensign (32.9%).

All jurisdictions, with the exception of the Village of Garden, within Delta County are zoned. Escanaba, Gladstone, and the Townships of Bark River, Escanaba, Ford River and Masonville administer their own zoning ordinances. The Delta County Zoning Ordinance applies to all other Townships and is administered by the Delta County Building and Zoning Department.

Building permits for all jurisdictions, except for the City of Gladstone, are issued by the Delta County Building and Zoning Department. The city employs a building inspector who is responsible for the issuance of permits. Plumbing, mechanical and electrical inspections are performed countywide by state personnel.

Forty-three percent of Delta County housing structures were constructed before 1960. Natural gas and propane are the principal heating fuels in about 80 percent of residential structures. Wood (9.8 percent), electricity (6.4 percent) and fuel oil (1.8 percent) are the other principal heating fuels.

The construction standards of many seasonal units are not known. Roads to such structures are generally constructed to meet the needs of occasional usage. Road widths, curves, grades and base sufficiency may be problematic for emergency vehicles.

There are 33 state licensed adult group homes and adult foster care facilities in Delta County

with capacities ranging from 1 to 31 persons. They may serve developmentally disabled, physically handicapped, mentally ill, or aged persons.

Three licensed nursing homes in Delta County provide long-term care. They are as follows:

- Bishop Noa Home-81 beds
- Christian Park Health Care Center-99 beds
- Christian Park Village-59 beds

Publicly-subsidized housing complexes are listed in Table 2-6.

Table 2-6
Publicly Subsidized Housing Units, Delta County

Name	Location	Year Built	Description
Bridgewood	800 South 2nd Street Escanaba	1978	Elderly (14) 1-bedroom
Harbor Tower	110 South 5th Street Escanaba	1970	Elderly (175) 1-bedroom (1) 2-bedroom
Les Cheneaux Apartments	825 South 26th Street Escanaba	1984	Family (18) 1-bedroom (6) 2-bedroom (12) 3-bedroom
West Highlands/Sandhill	2701 1st Avenue South Escanaba	1977	Elderly (123) 1-bedroom (10) 2-bedroom Family (65) 2-bedroom
Willow Creek Apartments	2414 8th Avenue South Escanaba	1989	Elderly (24) 1-bedroom
Willow Creek II Apartments	2414 8th Avenue South Escanaba	1993	Family (28) 1-bedroom (4) 2-bedroom
Bayview	217 Dakota Ave. Gladstone	1983	Elderly (50) 1-bedroom (2) 2-bedroom
Fairview Manor	415 South 4th Street Gladstone	1969	Elderly (48) 1-bedroom (2) 2-bedroom
Lakeview Apartments	610 Railway Avenue Gladstone	1982	Family (16) 1-bedroom (16) 2-bedroom

Table 2-6
Publicly Subsidized Housing Units, Delta County

Name	Location	Year Built	Description
Thorntree	3100 Thorntree Gladstone	2001	Family (4) 1-bedroom (16) 2-bedroom (20) Townhouse (16) 3-bedroom
Riverside Manor	10570 North Main Street Rapid River	1981	Elderly (3) Efficiency (21) 1-bedroom
Meadowbrook Apartments	3610 8th Avenue South Escanaba	2005	Elderly (28) 1-bedroom (4) 2-bedroom
Willowgrove Townhomes	850 South 38th Street Escanaba	2005	Family (19) 1-bedroom (29) 2-bedroom

Source: Michigan State Housing Development Authority Directory, July 2021.

2.7 Public Infrastructure and Utility Services

Wastewater

Wastewater is treated through on-site systems in all areas of Delta County with the exception of the cities of Escanaba and Gladstone and the communities of Rapid River and Bark River. Sewer service is provided to Rapid River between the Rapid and Tacoosh Rivers, along the south side of US-2 to just east of the US-2/US-41 intersection, to Ohman Estates and to isolated customers along Bay Shore Drive. The system is owned by Masonville Township but is maintained by the City of Gladstone. In 2008-09 Bark River Township received funding to connect the community of Bark River with the Hannahville Indian Community's wastewater system. The Township collects and conveys wastewater to a common point and pumps it to the Hannahville Indian Community Wastewater Treatment Plant.

Water

The cities of Escanaba and Gladstone draw, treat, and distribute water from Little Bay de Noc to a customer base roughly equivalent to their populations. Escanaba extended its distribution system to include parts of Wells Township.

Groundwater is the source for municipal systems in the Village of Garden, Nahma, Rock and Ford River. The Rapid River Housing Commission operates a community water supply for its Riverside Manor housing facility. Currently, all other areas of Delta County utilize private wells.

Electric

There are five electrical service providers in Delta County. Cloverland Electric Cooperative distributes power to the Garden Peninsula. Alger-Delta Cooperative Electric Association serves

much of northern Delta County, Stonington Peninsula and northwestern Cornell Township. UPPCO (Upper Peninsula Power Company) and WE Energies supply most of western Delta County.

Escanaba previously generated and distributed power from a municipal plant for distribution throughout the City. As of June 2015, the City of Escanaba ceased operations at the generating plant; the city of Escanaba owns and maintains its distribution system, but now purchases municipal services through Great Lakes Utilities. The city of Gladstone purchases power from WPPI but owns and maintains its distribution system. UPPCO maintains a peaking unit near Saunders Point in Gladstone.

Telephone

Several national and regional telephone providers service Delta County. Most residents receive landline phone service from AT&T or Charter Communications. Northern portions of Delta County rely on either TDS or Hiawatha Telephone for landline phone service. Landline telephone service to the greater Garden Peninsula area is through Century Link. Many residents are utilizing wireless phone services instead of landline telephone service available through a variety of cellular telephone providers.

Natural Gas

Natural gas service is limited to the population center in the south-central part of Delta County and along trunklines from DTE Energy.

Sanitary Landfill

Delta County residents and businesses use the Delta County landfill, a licensed Type II (household waste) facility at 5701 19th Avenue North in Escanaba. It is managed by the Delta Solid Waste Management Authority, a body comprising local governmental officials. Leachate (rainwater that permeates through solid waste) is collected and pumped to the Escanaba Wastewater Treatment Plant. Household hazardous waste is accepted by appointment, recorded and stored in specially-constructed containment buildings. Hazardous waste is shipped to appropriate disposal/destruction facilities. A chain-of-custody provides a record of each hazardous item.

The current landfill was expanded in 2015 and is expected to provide for at least 50 years of disposal. A recycling center and composting facility is located at the landfill.

2.8 Areas of Land Use Conflict

Shallow soils and fractured bedrock are problematic for on-site septic systems and groundwater protection in much of the county. This is of particular concern along lakeshore areas from north of the City of Gladstone to Fairport, as well as along Delta County streams.

Waterfront development pressures are converting natural areas to homes and cottages at a rapid rate. Many existing recreational dwellings are being converted to year-round use, especially those along lakes and streams. Conversions and development in such areas may

have undesirable environmental consequences. High risk erosion areas and floodplain areas have special siting requirements. Potential conflicts may arise where residential development occurs next to active agricultural areas.

Development continues along trunkline corridors from Gladstone through Escanaba. With more traffic entering and exiting commercial establishments, safety concerns increase. Additionally, residential development is occurring largely on previously undeveloped land in the townships with an evident preference for large lot sizes and large homes. An adequate roadway for passage of utility service emergency vehicles is a common concern. Furthermore, more local traffic is generated as residential development occurs farther away from the commercial and institutional entities, increasing the number of commuters.

2.9 Historic Resources

There are museum facilities located at Sand Point in Escanaba, Fayette State Park and the Village of Garden. A complete list of historic sites in the area is in Appendix B.

2.10 Transportation

Trunkline transportation is provided on Highways US-2, US-41, M-35, M-69 and M-183. Their collective in-county distance is about 150 miles - about 14 percent of the total road system in Delta County. County primary roads total 326.5 miles and there are 531.64 miles of county local roads. The county system is managed by the Delta County Road Commission and includes 83 bridges, some of which have weight restrictions due to structural condition. Federal roads - including two-tracks - serving the Hiawatha National Forest total between 700 and 800 miles. Approximately 125 miles of federal forest roads are high grade roads, the most important of which is FF-13 that runs from Nahma Junction to Alger County. The Cities of Escanaba and Gladstone have 82.96 and 46.93 miles of streets respectively. The Village of Garden has 2.6 miles of roadway. All mileages cited are as certified under Act 51.

Over 81 percent of households with workers aged 16 and older had at least one vehicle available to travel to work. The 2006-2010 American Community Survey Estimates indicate that work commuting time decreased slightly from an average of 18.8 minutes in 2000 to 18.6 minutes for Delta County residents in 2010; the 2019 American Community Survey estimated that that time had increased to 19.8 minutes.

Annual average daily traffic volumes as recorded by the Michigan Department of Transportation are illustrated in map 7; for select trunkline locations in 2020 volumes are as follows:

- Garden Corners 3,800
- Perkins 2,300
- Ford River 3,900
- Gladstone 12,000
- Rapid River 8,300
- Escanaba 16,600

Delta Area Transportation Authority provides county-wide bus service on a demand-response basis. Buses are equipped with wheelchair lifts. Intercity bus transportation is available from several locations via Indian Trails.

Commercial air service is available from the Delta County Airport (elevation 609 feet). The airport features two paved runways, a fuel farm and passenger terminal. The east-west runway is 6,500 feet in length by 150 feet wide. The north-south runway is 5,000 feet by 100 feet.

A basic utility airport with a 3,000-foot turf runway is located in the area known as West Gladstone (elevation 720 feet).

Wisconsin Central Railroad was acquired by Canadian National Railroad in 2000. Its north-south line runs from Escanaba to Marquette County in close proximity to M-35. The east-west line runs from southern Garden Township to Bark River and closely follows the route of US-2. Included in the acquisition was the iron ore dock in Escanaba, which was closed in 2017. Switch facilities are in Gladstone and repair facilities in Escanaba.

The Lake Superior and Escanaba Railroad is headquartered in Wells Township along the Escanaba River. Their route follows the Escanaba River to the Billerud paper mill with rails in place to the Marquette County line near Hendricks in Cornell Township. Tracks north of the Billerud facility have not been active for several years.

The ports of Escanaba and Gladstone afford receipt of bulky commodities such as coal, salt and bituminous. In 2010, 3.8 million tons of iron ore was shipped from Escanaba. Six million tons were shipped in 2000. The port of Escanaba also ships mine tailings (used in cement products) and receives limestone which is then sent overland by rail to its destination.

Map 1 illustrates major trunklines and railroads within Delta County.

2.11 Economic Characteristics

Most employment in the county is found in management, business, science, and arts occupations. Over 23% of employed persons in Delta County is engaged in educational, health, or social services. 14.5% are employed in manufacturing. The hospitality industry (entertainment, recreation, lodgings and food services) employs about 10 percent of Delta County's workforce with another 13 percent involved in retail and wholesale trade. Tourism is an important part of the overall county economy with many public and private attractions. Detailed information is presented in table 2-7.

Billerud Paper is the largest employer in Delta County. It has a direct impact on the local forest products industry for which it is a major customer. Engineered Machined Products is the second largest manufacturing employer in Delta County. There is a strong and sizeable base of metal, wood and plastic manufacturers with workforces of less than 100 located in the Escanaba-Gladstone small urban area. Other large county employers include OSF St. Francis

Hospital, Wal-Mart, Elmer's County Market, Christian Park and local governments and educational entities.

Table 2-7
Percentage of Employed Persons by Industry, 2019

Industrial Category	Delta County	Michigan
Agriculture, forestry, fishing and mining	2.1	1.4
Construction	6.4	4.8
Manufacturing	14.5	16.5
Wholesale trade	2.1	2.5
Retail trade	13.0	11.9
Transportation and utilities	6.5	4.1
Information	1.9	1.7
Finance, insurance and real estate	4.7	5.5
Professional, scientific, management, administrative, and waste management services	5.1	9.0
Education, health and social services	23.9	24.3
Arts, entertainment, recreation, accommodations and food services	10.2	9.5
Other services	5.5	4.9
Public administration	4.3	3.9

Source: Table DP-03 Selected Economic Characteristics, American Community Survey Estimates 2019.

Delta County's 2012 workforce - both employed and unemployed - was estimated at 16,426. In general, unemployment rates in the Upper Peninsula are typically higher than the state overall. Average annual unemployment rates for 2019 are as follows:

Delta County	5.1%
Upper Peninsula	6.34%
Michigan	4%
United States	3.6%

Per capita income for 2019 was $27,632; the statewide figure was $49,238. Median household income for 2019 was $47,434 compared to $59,584 for Michigan overall. The percentage of Delta County residents with incomes below the poverty level was 12.9 percent for 2019 while the statewide rate was 13 percent.

2.12 Population

As Table 2-8 shows, the county population has been relatively stable since the early 1900s. Delta County's population declined 3.8 percent between 2000 and 2010. Although more spread out due to lifestyle preferences, Delta County's population remains concentrated within a few miles of the major transportation corridor from Gladstone to Escanaba. Population losses were recorded in the City of Escanaba and the City of Gladstone, the Village of Garden and every Township in the County with the exceptions of Baldwin and Cornell Townships, which experienced slight growth. Table 2-9 illustrates the population of each jurisdiction from 1940 to 2010.

According to Census data from 2000 and 2010, the median age of Delta County residents

increased by 12.9 percent over the course of a decade. Generally, median age rises with distance from the population center. This is largely attributable to the living preferences of persons with no children, many of whom are retired. Median age information is presented in Table 2-10.

Table 2-8
Population History, Delta County

Year	Population
1860	1,163
1870	2,542
1880	6,812
1890	15,330
1900	23,881
1910	30,108
1920	30,909
1930	32,280
1940	34,037
1950	32,913
1960	34,298
1970	35,924
1980	38,947
1990	37,780
2000	38,520
2010	37,069
2020	36,903

Source: U.S. Bureau of the Census for years cited

Table 2-9
Historic Population Trends, Selected Areas, 1940-2020

Area	1940	1950	1960	1970	1980	1990	2000	2010	2020	% Change 2010-2020	% Change 1940-2020
Baldwin Township	887	689	647	610	769	726	748	759	678*	-10.7	-23.6
Bay de Noc Township	456	386	266	312	343	320	329	305	339*	+11.2	-25.7
Brampton Township	593	555	589	737	1,113	1,142	1,090	1,050	984*	-6.3	+65.9
Ensign Township	552	446	431	505	746	669	780	748	756*	+1.1	+37.0
Maple Ridge Township	1,394	1,166	913	775	946	829	808	766	683*	-10.8	-51.0
Masonville Township	1,470	1,165	1,255	1,409	1,807	1,709	1,877	1,734	1,493*	-13.9	+1.6
Nahma Township	1,245	954	569	499	517	491	499	495	452*	-8.7	-63.7
City of Escanaba	14,830	15,170	15,391	15,368	14,355	13,659	13,140	12,616	12,251*	-2.9	-17.4
City of Gladstone	4,972	4,831	5,267	5,237	4,533	4,565	5,032	4,937	4,753*	-3.7	-4.4
Delta County	34,037	32,913	34,298	35,924	38,947	37,780	38,520	37,069	36,903	-0.5	+8.4
Michigan	5,256,106	6,371,766	7,824,965	8,875,083	9,262,078	9,290,215	9,938,444	9,883,640	10,077,331	+2.0	+91.7
United States	131,669,275	151,325,798	179,323,175	203,302,031	226,542,199	248,709,873	281,421,906	308,745,538	331,449,281	+7.5	+151.7

*2019 ACS estimates

Table 2-10
Median Age, Delta County Jurisdictions, 2000-2020

Jurisdiction	2000 Median Age	2010 Median Age	2020 Median Age*	Change 2010 to 2020
Baldwin Township	41.3	48.6	51.6	+3
Bark River Township	36.3	41.4	40.8	-0.6
Bay de Noc Township	51.1	58.7	63.0	+4.3
Brampton Township	42.4	50.5	58.5	+8
Cornell Township	42.4	47.6	47.2	-0.4
Ensign Township	43.8	53.4	51.9	-1.5
City of Escanaba	40.1	41.4	43.4	+2
Escanaba Township	38.8	45.7	50.4	+4.7
Fairbanks Township	46.6	55.2	52.7	-2.5
Ford River Township	42.1	49.9	52.7	+2.8
Garden Township	45.6	53.8	61.7	+7.9
* Village of Garden	45.0	49.4	44.1	-5.3
City of Gladstone	39.9	43.6	41.7	-1.9
Maple Ridge Township	41.8	47.9	46.4	-1.5
Masonville Township	42.2	49.1	47.6	-1.5
Nahma Township	50.8	53.9	59.8	+5.9
Wells Township	38.6	45.7	51.9	+6.2
DELTA COUNTY	**40.4**	45.6	47.4	+1.8

Source: U.S. Census Bureau for years cited, *2019 estimates

3.0 HAZARDS

Delta County is subject to a wide range of natural and man-made hazards every year. Therefore, an all-hazards approach was taken with mitigation planning. Research and identification of hazards was an extensive process, which gathered input from local officials and residents of Delta County.

Section 3.1 describes the hazard rating and ranking process. The results of this process guided the determination of risk and vulnerability. Section 3.2 describes risk and vulnerability assessments and why they are done. Last in this chapter, Section 3.3 describes each hazard with corresponding risk ranking and vulnerability statement.

3.1 Hazard Rating and Ranking

Generally, hazards of all types were evaluated according to **probability of future occurrence**, **impact** (overall effect on community), and **extent** (magnitude of impact). Specifically, the following factors were used to evaluate hazards:

1. Casualty Potential
2. Percent of Population Affected
3. Likelihood of Occurrence
4. Capacity to Cause Physical Damage
5. Size of Affected Areas
6. Corollary Effects

Local residents from business and industry, police and fire agencies, emergency services, education, public health, medical services, transportation, planning and zoning, and local elected officials participated in a review and discussion as the Delta County Local Emergency Planning Commission (LEPC). Hazards were evaluated and ranked using the above factors. As such, each ranking takes into account the probability of future occurrence, impact, and extent of hazards. Some two-dozen residents participated in the process.

During the 2021-2022 plan revision process, CUPPAD staff reviewed and incorporated local news and reported information and statistical data from state and federal agency databases to update hazard occurrence information where available. Relevant regional and statewide studies, reports, and technical information related to hazards were used to update hazard descriptions and information where appropriate.

<u>Revisions to the Hazard Rankings</u>

In 2021, the Delta County LEPC revisited the rankings that were established for the 2007 Hazard Mitigation Plan and 2015 update. The Committee utilized information as presented in this Chapter as well as knowledge the Committee members gained over the years in dealing with

local emergencies. It was the Committee's concurrence that a number of issues warranted the rankings to change:

•The Committee prioritized public health emergencies, hazardous material fixed sites, and infrastructure failures higher than in prior years. Public health was prioritized due to experiences during the ongoing COVID-19 pandemic. Fixed site hazardous materials increased due to several high-profile sites located in the county, and first responder concerns with facilities near the Escanaba River. Infrastructure failures were prioritized due to several incidents occurring in recent years across the county where services were unavailable or compromised in large population centers.

•Petroleum pipeline failures increased into the moderate risk category because pipelines in Delta County cross several rivers, and the spill in Kalamazoo highlighted the massive mitigation cost of river spills. Concern over public opinion regarding the Enbridge Line 5 project through the Upper Peninsula has also been noted.

• The introduction of cyber security as a high-ranked hazard due to several high-profile events where municipalities' systems have been compromised, and concern with the vulnerability of local resources.

• The Committee also reduced the ranking of temperature extremes, hail, economic adversity, and terrorism and bioterrorism as local concern for these issues has waned somewhat and no significant occurrences have been reported for the past several years.

The county hazard ranking and the hazard rating score for 2007 (the original plan) and the ranking for 2013, 2015, and 2021 (the updates) are shown in Table 3-1. Appendix C gives more detail into the methodology of the hazard rankings.

3.2 Risk and Vulnerability Assessments

The risk and vulnerability assessments are closely related steps in the hazard analysis process. Both assessments were used in analyzing hazards in Delta County.

Risk Assessment is a description and/or map where hazards exist in the community to gain some idea of how often they arise and how much harm they might do in the future. Through risk assessment each hazard is addressed to some degree and there are three basic degrees of assessment: cursory, standard, and advanced.

> Cursory Assessment: A short statement explaining why a particular hazard is not considered a threat. This type of statement is applied to low-risk hazards.

Standard Analysis: An analysis in which readily available information is gathered, evaluated, and explained using text and maps as appropriate but for which no special evaluation techniques were used. Explanations of this type are applied to moderate or high-risk hazards.

Advanced Analysis: An application of theoretical or expert knowledge that requires significant time, expense, and training to be applied. This type of analysis is reserved for the highest-risk hazards and is used if the appropriate expertise is available.

A Vulnerability Assessment gives quantitative estimates of the people and property in the community that are vulnerable to each hazard. Examples would be the number of people at risk, structures vulnerable to damage, key services affected, and estimates of cost.

In mitigation planning, professionals have not been able to reach agreement on where risk assessments end and vulnerability assessments start. Often these two types blend together.

The risk and vulnerability assessments for Delta County hazards were combined and entered under the heading *Vulnerability*.

Delta County Hazard Rankings

Hazard	2007 Plan	2013	2015	2021	
	Ranking	Ranking	Ranking	Ranking	Risk
Hazardous Materials – Transportation	1	1	1	1	
Snowstorms	3	3	3	2	
Ice & Sleet	2	2	2	3	**High**
Structural Fires	12	15	4	4	
Public Health Emergencies	19	10	11	5	
Hazardous Materials – Fixed Site	6	6	21	6	
Infrastructure Failures	17	19	13	7	
Cyber Security	N/A	N/A	N/A	8	
Severe Wind	4	4	4	9	
Wildfires	15	17	10	10	
Lightning and Thunderstorms	5	5	7	11	
Transportation Accidents	18	20	6	12	
Active Shooter	N/A	N/A	N/A	13	
Workplace Violence	21	8	30	14	
School Violence	14	7	26	15	
Tornadoes	7	9	15	16	**Moderate**
Pipeline Failures	26*	27	22	17	
Dam Failures	24	24	25	18	
Mass Casualities	N/A	N/A	N/A	19	
Great Lakes Flooding	26*	26	19	20	
Riverine Flooding	25	25	12	21	
Urban Flooding	22	22	16	22	
Temperature Extremes	10	13	9	23	
Other Environmental (invasive, exotics, diseases,	19*	21	14	24	
Hail	16	18	23	25	
Drought	23	23	16	26	
Economic Recession/Adversity	13	16	8	27	
Civil Disturbance	28	28	23	28	**Low**
Bioterrorism	9	12	20	29	
Terrorism, Sabotage, WMD	8	11	18	30	
Public Assembly Events	11	14	27	31	
Scrap Tire Fires	29	29	31	32	
Subsidence	30*	32	28	33	
Earthquakes	30*	30	29	34	
Nuclear Power Plant Accidents	30*	31	31	35	

3.3 Hazard Analysis

Hazards in the following sections are divided into three categories: natural, technological, and social. Discussion of each hazard includes a definition, vulnerability statement, and information about the hazard's **extent** and **impact.** Additionally, discussion of each hazard addresses the **probability** of future hazard events in Delta County. Furthermore, each ranking takes into account the probability of future occurrence, impact, and extent.

Sources

Weather events reported in this document are from the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI). The NCEI Storm Events Database contains various types of storm reports January 1950 to Present. NCEI receives *Storm Data* from the National Weather Service (NWS). The National Weather service receives their information from a variety of sources, which include but are not limited to county, state and federal emergency management officials, local law enforcement officials, Skywarn spotters, NWS damage surveys, newspaper clipping services, the insurance industry and the general public. Appendix E records historic weather events in Delta County from 1950-2020 from the NCEI database.

Storm Data is an official publication of the NOAA, which documents the occurrence of storms and other significant weather phenomena having sufficient intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce. In addition, it is a partial record of other significant meteorological events, such as record maximum or minimum temperatures or precipitation that occurs in connection with another event. Some information appearing in *Storm Data* may be provided by or gathered from sources outside the NWS, such as the media, law enforcement and/or other government agencies, private companies, individuals, etc. An effort is made to use the best available information but because of time and resource constraints, information from these sources may be unverified by the NWS. The NWS makes a best guess using all available data at the time of the publication. Because the damage amounts are received from a variety of sources, these should be considered as a broad estimate. The sources include those listed in the Property and Crop damage reports. It should be noted that the years identified for this update are from January 1, 2005, through December 31, 2020, unless otherwise indicated. For simplification, the dates are shown as 2005-2020, which is a sixteen year inclusive period.

FEMA publications, including the National Risk Index application, and the statewide Michigan Hazard Analysis were used were appropriate Relevant state and federal databases were used to update occurrence information where appropriate for all hazards. Local news articles and reports were examined to update the social and technological hazard occurrences where information was available.

3.3.1 Natural Hazards

Hazards caused by wildfires, flooding, severe meteorological events, and unstable ground will be addressed in this section. Unstable ground includes areas affected by mining and excavation.

Wildfires

Hazard description: An uncontrolled fire in grasslands, brush lands or forested areas.

RISK: MODERATE

RANKING: 10TH

Human activity is responsible for 90 percent of wildfires; lightning strikes cause less than 10 percent. Wildfires can be separated by those that threaten public safety and those that threaten natural resources, e.g., timbered areas. Given the vast amount forestland in Delta County, wildfires pose a significant risk.

With a large number of rural homes and seasonal dwellings being built in wildland areas, there is a greater potential for life and property loss.

Between 2007-2020, Michigan's 6,127 wildland fires consumed a total of 86,341 acres. The fire season in 2012, during a moderate drought, produced over 700 fires and burned over 28,000 acres. Springtime before green up is typically the busiest time for firefighters with grass and brush fires. The threat in forested areas increases during summer months as weather is a critical factor. Fire ignition sources are abundant - trains, off-road vehicles, farm equipment, trees falling on power lines, human activities and many others.

As reported by the MDNR Fire Management division, there have been 129 wildland fires in Delta County between 2007-2020 (9.2/year), with 15 occurring during the drought recorded in the year 2012. Local fire departments coordinate response with firefighters from the MDNR station in Escanaba and US Forest Service office in Gladstone. Fires during this time period where largely caused by people burning debris. Local fire departments do not provide readily available information on wildfires occurring primarily on private lands.

The Stockyard wildland fire swept through the northern Stonington Peninsula area in July 1988. The forest type in this area is predominately jack and red pine, both high-risk fire species. In all, 1,100 acres burned in roughly five hours.

The Poverty Island wildfire was ignited by lightning on June 26, 2016. The fire burned for several days on the uninhabited island until it was reported by local residents and threatened a historic lighthouse and other structures. Efforts to contain the fire were hampered by severe weather and the island's remote location, approximately six miles south of the community of Fairport in Lake Michigan. The fire smoldered for several weeks in rugged parts of the island

until it was finally deemed contained. Several federal agencies collaborated in fighting the fire, which ultimately burned over 60 acres of the 200-acre island.

The National Weather Service provides fire weather forecasts to federal agencies in the area. A local office for the Upper Peninsula is in Marquette. During periods of high fire danger, the NWS prepares a daily Wildfire Potential Statement. The economy of the county depends on several large firms harvesting and processing timber products. Given the vast amount of forestland, wildfires are a moderate to high-risk hazard in the county. The FEMA National Risk Index records that wildfire risk and expected annual losses in Delta County are very low.

Vulnerability: Delta County has approximately three-fourths of the land area covered by forest. Approximately one-third of the forest cover is upland/lowland coniferous species which is of special concern due to its high flammability (see Appendix F, Map 3). Taken into consideration with the numerous forest fires in the county, wildfires have a high probability of occurrence, and occur approximately 9.2 times on average per year. While the heavily forested area of the County poses a moderate wildfire risk overall in terms of impact and extent, the Stonington Peninsula area in the south-central part of Delta County has historically posed a much higher risk in terms of impact and extent because of structures' proximity to highly flammable tree species.

The Stonington Peninsula area is classified as a "classic urban interface" and has a long history of wildland fires. Hundreds of permanent homes, seasonal homes and camps, various businesses, public recreation areas, and a school (Rapid River Public Schools) are located in this high-risk fire area.

Flooding

Hazard description: A rising or overflowing of a body of water caused by rapid snowmelt, excessive precipitation, ice buildup, storm surges, wind or sustained high water levels.

Floods are a natural occurrence. They are also the number one weather-related killers in the nation. The NWS uses these terms to define threatening flood hazards:

- **Flood Watch** is the first of two basic advisories issued by the NWS. A flood watch is issued when conditions are such that there is a threat of flooding, but the occurrence is neither certain nor imminent. The advisory does give a community an early notice of potential flooding.
- **Flood Warning** is the second basic advisory issued by the National Weather Service. A flood warning is issued when flooding is occurring or flooding conditions are expected to develop. In some cases, the flood warning will be for a specific river or for a height in feet. The NWS tries to issue flood forecasts with an accuracy of plus or minus one foot;

however, many variables can enter into this forecast. Some of the variables are difficult to predict, yet have great impacts on flood forecasts.

- **Small Stream Advisory** means to be alert regarding potential flooding of small streams, streets, urban storm drains, underpasses, and low-lying areas.

The NWS uses the following terms to describe flooding severity:

- Minor flooding - minimal or no property damage; possibly some inconvenience.
- Moderate flooding - inundation of some secondary roads; suggest transfer to higher ground; some evacuation may be necessary
- Major flooding - extensive inundation and property damage; evacuation of people and livestock and closure of primary and secondary roads is likely

Development within identified floodplain areas assumes a certain risk. A flood event can destroy or damage property, disable utilities, inundate roadways and bridges making them impassable, and affect agricultural lands. Furthermore, flooding can be life-threatening and impede emergency services. The natural capacity of watersheds to retain and release moisture is altered by development that creates impervious surfaces and/or changes natural drainage patterns.

State regulations require a permit for any occupation, construction, or filling or grading within the floodplain of a river, stream or drain. The lowest floor of structures (including basements) must be elevated to or above the 100-year flood elevation (base flood elevation). Flooding severity is expressed in terms of frequency, i.e., 500-year, 100-year, 50-year, and 10-year floods. The probability of exceeding the base flood elevation increases from the limits of these areas identified in flood hazard maps. For example, a 100-year flood has at least a one percent chance of happening each year beginning at the identified limit.

To safeguard development in high-risk erosion areas along the Lake Michigan shoreline, regulations establish required setback distances from the shoreline to protect new structures. The Michigan Department of Environment, Great Lakes, and Energy (EGLE) requires special permits for construction activities within identified at-risk erosion areas. Map 6 illustrates floodplain areas. Parcels determined to be at-risk are found in townships of Ensign, Ford River, Masonville, and Wells and the city of Gladstone.

FEMA's National Flood Insurance Program (NFIP) allows participating communities to purchase flood insurance. Local governmental units within Delta County participating in the National Flood Insurance Program are: Bay de Noc, Brampton, Cornell, Ensign, Escanaba, Fairbanks, Ford River, Garden, Masonville, Nahma, and Wells Townships, Cities of Escanaba and Gladstone and the Village of Garden (see Table 3-2). Floodplain mapping used in conjunction with the NFIP

has been completed for these areas. Baldwin Township does not participate although special flood hazard areas have been identified. Bark River Township does not participate because flooding is not a hazard.

Table 3-2
National Flood Insurance Program Participants, Delta County, 2021

Community Identification Number (CID)	**Jurisdiction**	**Date of Entry**	**Current Effective Map**
260685#	Bay de Noc Township	12/18/1986(R)	6/8/1998
260386#	Brampton Township	05/16/1978(R)	6/8/1998
260768#	Cornell Township	12/18/1986(R)	6/8/1998
260752#	Ensign Township	12/18/1986(R)	6/8/1998
260061#	City of Escanaba	09/01/1977(R)	6/8/1998
260387#	Escanaba Township	12/18/1986(R)	6/8/1998
260804#	Fairbanks Township	09/30/1987(R)	6/8/1998
260062#	Ford River Township	04/04/1986(R)	6/8/1998
260763#	Garden Township	12/18/1986(R)	6/8/1998
260948#	Garden Village	10/20/2008	6/8/1998
260267#	City of Gladstone	09/15/1977(R)	6/8/1998
260687#	Masonville Township	03/31/1982(R)	6/8/1998
260688#	Nahma Township	09/30/1988(R)	6/8/1998
260388#	Wells Township	6/08/1998	6/8/1998

Note: (R) indicates entry in regular program
Source: Community Status Book Report, FEMA, July 11, 2021

Flood hazard maps illustrate susceptible areas when a stream reaches full-bank level. The average Michigan floodplain map is over 20 years old. Change within a drainage basin (development) affects natural water storage capacity with a resultant increase in both the area and severity of the potential flood areas. FEMA is (as of 2022) in the approval stage for updated flood risk maps for Delta County. FEMA's Flood Insurance Study for Delta County developed as part of update identifies the principal flood areas of the county as the shoreline along Lake Michigan and the flooding due to ice jams near the mouth of Rapid River. This study describes potential flooding areas across Delta County in great detail; Flood Risk Reports developed by FEMA can assist communities in identifying flood risks for a potential project area.

The Federal Emergency Management Agency's (FEMA) Lake Michigan Discovery Report, February 2013, prepared in conjunction with FEMA's Risk Mapping, Assessment, and Planning

(Risk MAP) program and the Great lakes coastal Flood Study (GLCFS) stated there were no repetitive flood claims in Delta County. During the process of updating this plan, updated information was requested from FEMA about NFIP-designated repetitive flood-loss properties, but new data was not received within the time of the planning process. Therefore, the best available data was referred to. No repetitive loss properties within Delta County have been noted on FEMA's official 2013 repetitive loss list or a partial 2017 list referenced by the Michigan State Police upon request.

The National Oceanic and Atmospheric Administration (NOAA) reported there were eight flood events in the county between January 1, 2005 and December 31, 2020. These events have historically affected roads in the county; a flash flood that occurred in June 2010 in Cornell Township resulted in a washout of County Road I. An ice jam forming on the Rapid River caused flooding over US-2 in April 2005. Heavy rains regularly affect driving conditions on some streets in Escanaba and Gladstone.

Riverine Flooding

Hazard description: A rising or overflowing of a river or creek caused by rapid snowmelt, excessive precipitation, and ice buildup.

RISK: MODERATE

RANKING: 21st

Excessive precipitation or runoff, especially in springtime, can cause streams to overflow their banks with resulting damage. Brief periods of flooding are seasonal events in some low-lying natural areas.

Historic records indicated that in late-April 1996, river flooding occurred along the Escanaba and Ford Rivers and several small streams. Rapid snowmelt in combination with rainfall forced the closure of up to 24 roads and inundated yards, driveways and basements. A major washout occurred on M-35 at Portage Creek. Washed out roads from this flood event caused most of the estimated $800,000 of property damage.

Springtime ice jams at the Rapid River train bridge have caused multiple floods over the years. There are several county locations, such as US2/41 in the community of Rapid River, along M-35 south near the Ford River triangle and at M-35 near the viaduct in Gladstone, where road drainage (storm drains, ditching, elevation, slope) is inadequate to prevent temporary flooding during heavy precipitation events. Storm drains may be frozen or become clogged, or a storm sewer system may be overwhelmed. Roadways can be severely damaged and traffic safety is a concern under these circumstances.

On the morning of April 2, 2005, an ice jam formed on the Rapid River three miles north of the

community of Rapid River. Minor flooding occurred in Rapid River and Maplewood areas, with water flowing over Highway 2 in Rapid River. An excavator was used to break up the ice jam the next day, after which the flood waters receded.

In April 2014, ice jams on the Tecoosh, Rapid, and Escanaba Rivers backed up water near the community of Rapid River and Dam #3 on the Escanaba River near Cornell. In the area near Rapid River, backwater flooding inundated the US-2 bridge for a time until the county road commission broke up the jam with heavy equipment. Flooding in both areas affected several homes and camps along the river, with $75,000 in reported damage.

Vulnerability: Most riverine flooding in the County occurs in undeveloped areas with little impact to people and property. It is likely to occur regularly in early spring due to ice jams, snowmelt or a combination of snowmelt and rainfall. With little topographic relief along the rivers and streams, excessive water spreads out from the banks rather than creating a rushing torrent. The FEMA National Risk Index calculates that the risk of riverine flooding and expected loss in Delta County is very low.

River flooding is still a potential hazard. There are recorded instances, such as along the Rapid River near Rivers 22nd Road, along the Escanaba River in Cornell Township between Boney Falls and Dam #3, and in Bark River Township along the Ten Mile Creek, where river flooding has forced the closing of roads, inundated yards, driveways, and basements causing property damage and safety concerns.

Great Lakes Shoreline Flooding

Hazard description: The rising of Lake Michigan caused by ice buildup, storm surges, wind or sustained high water levels.

RISK: MODERATE

RATING: 20TH

The average water level of Lake Michigan from 1918 to 2021 is 578.87 feet. Record high levels were reached in the period from February 1986 to January 1987 that were about 5 feet above the long-term average. Current water levels have been 1-2 feet above the long-term average since 2017. High levels, when accompanied by onshore storms, have caused significant erosion in vulnerable areas. Property damage was incurred as some structures were intermittently flooded and roads damaged. Other notable high-water periods were recorded in 1973-1974 and the early 1950s. Conversely, there were record low periods occurring in 1964-65, 2008, and 2013.

A seiche is an oscillation of the surface of a lake similar to a sloshing of water back and forth in a bathtub. An occurrence can last from a few minutes to several hours and is caused by water

piling up on one side of the lake due to high barometric pressure or wind. When the cause abates, the bulging high water is free to head in the opposite direction.

Small seiches occur on the Great Lakes every day causing water levels to rise and fall. Seiches can reach ten feet and cause major damage along shorelines. Seven people lost their lives as a major seiche breached a Chicago dock in 1954. Significant seiches have been recorded at various Lake Superior locations including L'Anse, Munising and Sault Ste. Marie. A recent seiche was reported on July 19, 2019 at Manistique (Schoolcraft County). A thunderstorm to the south over Lake Michigan caused high waves and minor flooding along the boardwalk area, resulting in minor damage.

In October 2019, a low-pressure system produced strong east to southeast winds that induced lakeshore flooding along the Bay of Green Bay. Pictures of flooding and reports showed that flooding occurred at both the municipal harbors in Escanaba and Gladstone. Reported property damage in the NCEI database was $100,000.

Although the strongest, most damaging lake storms occur most generally in the fall, they can occur any time of the year. Circa 1975, a winter storm threatened US-2 as high water and winds moved ice well past the normal shoreline.

Vulnerability: Lake Michigan levels have been high in recent years with minor threat of flooding, notably during and after storms. Sustained high water levels and storms make flooding in coastal areas more probable. Erosion occurred during high water periods in the late 1980's, and minor erosion has been occurring. A return to the levels of that time could threaten structures in low-lying sandy areas. Erosion would specifically be accelerated in the identified high-risk erosion areas or sites located along the shoreline from Ford River to the Stonington Peninsula (Appendix F, Map 6). FEMA has identified the coastal areas of Delta County to be principal flood areas; with 211 miles of shoreline, most of the county's jurisdictions could potentially be affected. The Escanaba and Gladstone municipal harbors are at lower elevations than nearby residential structures; future lakeshore flooding damage may also be localized in these areas.

Urban Flooding

Hazard description: The rising of a body of water caused when drainage or pipe capacity is not sufficiently sized to carry away peak volume discharge.

RISK: MODERATE

RANKING: 22RD

The most common example of urban flooding is ponding on roadways when water depths exceed curb heights. Clogged catch basins and culverts can cause flooding as well.

Weather records from the past sixteen years have shown five instances of flash floods occurring because of heavy rains. Recurring flooding problems in areas of Lincoln and Sheridan Roads in Escanaba, at the US-2 Escanaba River bridge, and the M-35 railroad viaduct in Gladstone have created temporary traffic safety hazards. Heavy rains caused flooding in Cornell in June 2010, which resulted in the portions of County Road I being washed out. In the past, melting snow and rainfall flooded roads and have caused damage to area homes and businesses in Garden. No flash flooding event has been recorded in the NCEI database since 2010.

Vulnerability: Urban flooding has shown its potential to be a problem in the Cities of Escanaba and Gladstone and moderately developed outlying areas. Historically such events have been short-lived with a minimum of damage. Five flashflood instances have been recorded between 2005 and 2020, inclusive, though no event has been recorded since 2010. A June 2010 flashflood in Cornell resulted in the washout of a portion of County Road I causing $5,000 of damage. Based on the historical data discussed in this section, urban flooding is likely to occur once a year on average.

Severe Weather

Hazard description: Any of several extreme weather events occurring singly or in combination with a potential to damage property and compromise human safety.

The NWS, a division of the National Oceanic and Atmospheric Administration (NOAA), disseminates information by several means. NOAA weather radio is a readily available source for severe weather warnings, providing up-to-the-minute information. The Emergency Alert System replaced the Emergency Broadcast System (EAS) in 1996 and is used to transmit emergency information targeted to a specific area. Terms used in weather forecasts reflect the anticipated timing and severity of an approaching storm. A watch is issued if a particular hazard is possible because conditions are more favorable than usual for its occurrence. Planning and preparation is the recommended course of action when a weather watch is issued. A warning indicates that a particular weather hazard either is imminent or has been reported, and action to protect life and property is recommended.

Delta County receives NOAA weather broadcasts from transmitters in Escanaba (1,000 watts) and Marquette (1,000 watts), and can additionally pick up signals from Manistique (300 watts) and Sister Bay, Wisconsin (1,000 watts). Under most conditions, the reception range is about 40 miles. Coverage areas are included as maps 8A, 8B, 8C, and 8D.

Neither a countywide warning system nor local siren systems currently exist in the county.

Delta County has experienced severe weather events in all seasons. The most damaging

weather events have been caused by high winds. Appendix E describes severe weather events in Delta County from 1950 – 2020 inclusive.

The following describe individual severe weather events. However, it should be noted that severe thunderstorms are associated with damaging winds, hail, heavy rains capable of causing flash flooding, and lightning. Moreover, individual cold weather events can interact to cause many hazards. The difference between rain, ice or snow can be a matter of a few degrees.

Tornadoes

Hazard description: An extreme weather event with the potential to damage property and compromise human safety.

RISK: MODERATE

RANKING: 16TH

Historic weather records from 1968 through July 2021 reflect 18 tornadic and funnel cloud events in the county. In 1968, an F1 tornado near Rock destroyed a trailer and shed and caused property damage to a nearby home. In 1972, another F2 tornado near Rock demolished two trailers and 20 garages, damaged windows, and destroyed a small barn.

The most intense event was an F3 tornado in July 1987 that resulted in property damage of $25,000. Records are incomplete, but the tornado moved in a path from west to east across most of Delta County. The most property damage ($2.5 million) incurred during a tornado in July 1992. The 1992 event occurred in the urban area of Gladstone, rupturing a large tar storage tank and natural gas service lines, along with uprooting hundreds of trees. This event also resulted in two injuries. Two funnel clouds and a tornado were reported on the same day in 1998 with minor damages to property along the path northwest of Gladstone.

There have also been four documented sightings of funnel clouds and two tornadoes in the county within the past sixteen-year period (2005-2020 inclusive). In 2020, a brief F1 tornado in the Pine Ridge area west of Escanaba damaged a storage unit facility and knocked out power to nearby homes, causing $150,000 in damages.

The most recent occurring tornado was a confirmed EF1 tornado which touched down on the north side of US-2/41 three miles west of Escanaba on August 31, 2020. The tornado occurred during a non-thunderstorm event and briefly created a path on the ground over about a half-mile. The event caused the destruction of several units of a self-storage facility, and scattered the contents over a small area.

Table 3-3 Enhanced Fujita Tornado Scale	
Rating	Wind Speed Range
EF0	65- 85 miles per hour
EF1	86- 110 miles per hour
EF2	111- 135 miles per hour
EF3	136- 165 miles per hour
EF4	166- 200 miles per hour
EF5	Over 200 miles per hour

Vulnerability: Tornadic events are sporadic in Delta County. Six tornadic events (two tornadoes and four funnel clouds) were reported in Delta County during the past sixteen years. Historic data has shown eighteen tornadic events (eleven tornadoes and seven funnel clouds) in a 53-year period. The possibility of a tornadic event occurring per year in the county is 34 percent with a 5 percent chance of injury. When tornados do occur in the County, there is an incidence of property damage; however, this damage is localized. The extent of the damage is shown in Table 3-4.

Table 3-4 Tornadic Events						
Time frame	**# of events**	**Injuries**	**Casualties**	**Property damage**	**Crop damage**	**Damage total**
January 1968 to January 2004	12	3	0	$2.853 million	$0	$2.853 million
2005- 2012	3	0	0	$10,000	$0	$10,000
2013-2020	3	0	0	$150,000	$0	$150,000

Average events/year (18 ÷ 52 years)	0.34
Average injuries/year (3 ÷ 52)	0.05
Average casualties/year (none reported)	0
Estimated annual property damage ($3.013 million ÷ 52)	$57,942
Estimated annual crop damage (none reported)	$0
Estimated annual damage ($3.013 million ÷ 52)	$57,942
***Potential annual losses to critical facilities (**$57,942 x 25)	**$1,448,550**

*Potential annual losses are calculated based on number of critical facilities found throughout the county multiplied by the estimated annual property damage of the county. The potential amount is the maximum if every facility is damaged in the same year.

A tornadic event within a developed area would cause more property damage and affect more

people. Destruction of critical facilities and utility systems would impact a large percentage of the county population. However, tornadoes have a low probability of future occurrence. The FEMA National Risk Index reports that the risk and estimated losses from tornadoes in Delta County to be very low.

Hail

Hazard description: An extreme weather event with the potential to damage property and compromise human safety.

RISK: LOW

RANKING: 25TH

53 hail events in total have been recorded in the NCEI database since 1981 with size of the hail ranging from three-quarters of inch to two and half-inches in diameter. As such, hail events are likely to occur a couple times a year in Delta County. Hail typically accompanies thunderstorms that impact local to regional areas. Property damage was reported in four instances: Gladstone in 1996 causing $1,000 damage, Garden in July 2007 with $2,000 of property damage, Maplewood in July 2011 with $1,000 of property damage, and an event in Kipling in August 2015 that caused $15,000 of damage. In that event the Kipling area north of Gladstone received ping pong ball sized hail that did reported damage to vehicles.

Risks associated with hailstorms tend to be lower than those associated with thunderstorms. With the right weather conditions, hail can occur in any month, though late spring and summer are the most common times of the year. The FEMA National Risk Index reports that the risk and estimated losses from hail in Delta County are very low.

Vulnerability: Hail is associated with thunderstorms and its extent and impact generally confined to a small geographic area. All areas of the county are equally susceptible to hail events, and an event could be expected in the county at least 1-2 times per year. Hail itself is seldom of a size that is dangerous to people. If large enough, hail can damage equipment, vehicles, buildings, and agricultural crops. Reported damage has been $19,000 from four events. Anecdotal evidence suggests there has been localized damage from hailstorms, but these have not been included in the Storm Event Database.

Lightning and Thunderstorms

Hazard description: An extreme weather event with the potential to damage property and compromise human safety.

RISK: MODERATE

RANKING: 11th

Lightning is common during summer months with passing thunderstorms. Only floods and flash

floods cause more weather-related deaths.

Areas affected by such storms range from local to regional in size. A moderate risk is associated with these storms for human life and property. Most lightning damage is to property - especially electronic equipment. Lightning-induced structural and forest fires represent a significant hazard. Human injuries from lightning strikes are infrequent and deaths are rare.

Weather records from the NCEI database cite 106 thunderstorm and severe wind events between 1950 and 2020, with two injuries reported. In total, reported property damage has been over $1.5 million and crop damage over $12 million. Between the 1997 and 1998, 5 thunderstorm events were responsible for the majority of these damages. In 1997, wind speeds near Rock were recorded over 100kts., and a tornado accompanied the storm near Garden Corners. Events in 1998 caused minor property damage and 2 injuries, while downing significant areas of commercial timber in the Hiawatha National Forest.

Two recorded lightning events have caused structure fires, resulting the loss of barn and two houses, for a total of $130,000 of property damage.

Severe thunderstorms occur an average of 3-4 times per year. Most thunderstorms occur in the summer months of June, July, and August, but have been recorded as early as March and as late as September.

Vulnerability: See below.

Severe Winds

***Hazard description**: An extreme weather event with the potential to damage property and compromise human safety.*

RISK: MODERATE

RANKING: 9TH

High winds frequently accompany thunderstorms, most often in early to midsummer. On average, severe straight-line winds can be expected two to three times each year in the Upper Peninsula. Between 1957 and 2004, 52 thunderstorms with excess wind events were reported in Delta County; there were two reported injuries and total damage was in excess of $13.5 million as described above. Between 2005 and 2020 inclusive seven high wind events were recorded in the county; combined, these storms caused more than $58,000 of damage to property. The most costly of the storms occurred in December 2015 with winds of 60 miles per hour with property damage of $25,000, destroying two greenhouses and downing power lines near Rock. In 1997, record-high wind speeds near Rock were recorded over 100kts. (115 miles per hour), and a tornado accompanied the storm near Garden Corners. Events in 1998, with

wind speeds between 55-76 knots, caused minor property damage and 2 injuries while downing significant areas of commercial timber in the Hiawatha National Forest.

Wind zones reflect the number and strength of recorded wind events per 1,000 square miles. These designations were established for engineering design purposes (see Appendix F, Map 9). Zone IV includes the "tornado belt" and extends as far north as Minneapolis and Green Bay. Southern Dickinson, most of Menominee and southern Delta Counties are within Zone III (200 mph). The remainder of the U.P. is within Zone II (160 mph). The FEMA National Risk Index reports that the risk and estimated losses for strong wind events in Delta County are relatively low.

Vulnerability (Lightning & Thunderstorms and Severe Wind): The entire county is equally subject to lightning, thunderstorms and high wind events every year. Severe wind events have occurred in all areas of the county, however they tend to be localized. On average, one to two severe thunderstorm and high wind events can be expected each year. Lightning has also been a historic cause of wildfires in the county, particularly during drier periods; lightning is estimated to cause nearly 10% of wildfires nationwide each year. A direct impact on a small population occurs when structures suffer damage. Damage to utility networks with service interruptions can be expected. The impact can be direct through structural damage, or it can be indirect in the form of electrical or other service interruptions. Structural damage that results from a severe storm causes few, if any, human casualties.

Table 3-5
Thunderstorm Wind, Lightning, and High Wind Events

Timeframe	# of Events	Casualties	Property Damage	Crop Damage	Damage Total
Jan. 1957-Jan. 2004	52	2 (injury)	$1.277 million	$12.250 million	$13.527 million
2005- 2012	35	0	$89,200	$0	$89,200
2013-2020	21	0	$193,000	$0	$193,000

Average events/year (108 events ÷ 64 years)	1.68
Average injuries/year (2 ÷ 64 years)	0.03
Estimated annual property damage ($1.559 million ÷ 64 years)	$24,362
Estimated annual crop damage ($12.250 million ÷ 64 years)	$191,406
Estimated annual damage ($13.809 million ÷ 64 years)	$215,765
***Potential annual losses to critical facilities (**$24,362 x 25)	**$609,050**
***Potential annual losses to educational facilities (**$24,362 x 21)	**$511,602**

*Potential annual losses are calculated based on number of critical and education facilities found throughout the county multiplied by the estimated annual property damage of the county. The potential amount is the maximum if every facility is damaged in the same year.

Snowstorms

Hazard description: An extreme weather event with the potential to damage property and compromise human safety.

RISK: HIGH

RANKING: 2nd

Heavy snows and/or blowing snow (blizzards) events are expected each winter season. Impact to the community is low, as injuries and property damage generally do not result. Snowstorms cause short-term inconveniences, such as institutional and business closings or delays, treacherous driving and walking conditions. School closings due to winter weather (snow or ice storms) average three days per year. Property damage can result from fallen trees, downed power lines, and structures that collapse due to accumulated weight. There are financial costs to both the public and private sectors with snow removal. Escanaba averages roughly 52 inches of snowfall each year.

Snowstorms where wind speeds gust or sustain at 35 miles per hour or more and visibility is reduced to one-quarter mile or less for at least three hours are considered blizzards. One average, blizzard events occur about every five years.

Although hard to measure, a definite risk to human life accompanies snowstorms. Heart attacks and traffic accidents associated with snow events are not uncommon. The FEMA National Risk Index reports that the risk and expected loss due to winter weather in Delta County are relatively moderate.

The combined vulnerability for snowstorms and ice and sleet events is described below.

Ice and Sleet

Hazard description: An extreme weather event with the potential to damage property and compromise human safety.

RISK: HIGH

RANKING: 3rd

Historic weather data reports ice storms have occurred in January 1994, January 1998, March 2002, December 2002, January 2005, and February 2019. Property damage caused by the January 1994 storm was estimated at $5 million. Such storms pose a low risk to human life, but a higher risk to property. For humans, the risks are often secondary as traffic accidents and downed power lines. A lengthy interruption of electrical service could seriously imperil human

life and property.

Vulnerability (Winter Storms- Snowstorms & Ice and Sleet): NOAA data reflects an average of five significant winter storms each year. Ice and sleet events are likely to occur once every few years as part of winter storms. Storms or blizzards may necessitate the closing of businesses, institutions and roadways. Power outages and other utility interruptions can impact the entire population. Property damage occurs from removal, storm-induced accidents, and heavy snow loads on structures. Widespread property damage to utility lines, trees, and light duty coverings such as awnings, canopies, and carports are anticipated. The FEMA National Risk Index reports that the risk and expected loss due to ice storms occurring in Delta County are very low.

Historic weather data reported 91 snow and ice storms occurring between 1993 and 2020 that have an estimated cumulative property damage over five million dollars, although additional damage likely occurred. Table 3-6 shows the extent of this damage. There were no human casualties reported.

Table 3-6
Snow Storms and Ice Storm Events

Timeframe	# of Events	Casualties	Property Damage	Crop Damage	Damage Total
Jan. 1993-Jan. 2004	35	0	$5.05 million	0	$5.05 million
2005- 2012	31	0	$75,000	0	$75,000
2013-2020	25	0	$1,000	0	$1,000

Average events/year (91 ÷ 28)	6.85
Average injuries/year (none reported)	0.00
Estimated Annual Property Damage ($5.126 million ÷ 28)	$183,071
Estimated Annual Crop Damage ($0 ÷ 28)	$0
Estimated Annual Damage ($5.126 million ÷ 28)	$183,071
***Potential annual losses to critical facilities (**$183,071 x 25)	**$4,576,775**
***Potential annual losses to educational facilities (**$183,071 x 21)	**$3,844,491**

*Potential annual losses are calculated based on number of critical and education facilities found throughout the county multiplied by the estimated annual property damage of the county. The potential amount is the maximum if every facility is damaged in the same year.

Temperature Extremes

Hazard description: An extreme weather event with the potential to damage property and compromise human safety.

RISK: MODERATE

RANKING: 23rd

Above-average summertime temperatures are normally short-lived and pose a low risk to human life and property. Record cold temperatures are more likely to occur and have a bigger impact as they present a low to moderate risk to human life and property. Temperatures reaching minus 20 ° Fahrenheit (F) are common in the months of January and February; frigid temperatures can be expected at anytime from December through March in the area. Temperatures have eclipsed 30 °F below zero several times with wind chills of minus 70 °F. Continuous days of sub-zero temperatures in January 1994 resulted in a major disaster declaration for some areas in the region.

Cold weather threats for humans include frostbite and hypothermia that in extreme instances can be fatal. In addition to the direct risk to humans posed by extremely cold temperatures, there are many indirect risks, including poorly insulated housing with inefficient heating systems result in an elevated structure fire danger, equipment failure, and frozen water and sewer lines.

The Wind Chill Temperature (WCT) index has been used by the NWS since 2001. It is an improved model that more accurately gauges the dangers of freezing weather and is presented in Table 3-7.

Table 3-7
Wind Chill Temperature Index

Wind (mph)	Temperature (°F)										
Calm	35	30	25	20	15	10	5	0	-5	-10	-15
5	31	25	19	13	7	1	-5	-11	-16	-22	-28
10	27	21	15	9	3	-4	-10	-16	-22	-28	-35
15	25	19	13	6	0	-7	-13	-19	-26	-32	-39
20	24	17	11	4	-2	-9	-15	-22	-29	-35	-42
25	23	16	9	3	-4	-11	-17	-24	-31	-37	-44
30	22	15	8	1	-5	-12	-19	-26	-33	-39	-46
35	21	14	7	0	-7	-14	-21	-27	-34	-41	-48

Note: Shaded areas indicate frostbite will occur in 30 minutes or less.

Extremely warm temperatures are normally short-lived and a low risk to human life and

property. Heat strokes (life threatening) and heat exhaustion are the major threats associated with high temperatures. When high temperatures are accompanied by high humidity, an additional level of discomfort and bodily stress is realized. Damage to roadways (buckling), additional power costs for air conditioners, and discomfort for humans and animals who must work or endure such conditions are additional factors.

High temperature conditions are reported to the public using a heat index. The National Weather Service has designated three response levels based on the heat index:

- Warning - temperatures of 130° F or greater
- Watch - temperatures from 105° F to 129° F
- Advisory - temperatures from 90° F to 104° F

Temperatures in the advisory range can cause sunstroke, heat cramps and heat exhaustion; temperatures above 80° F can cause fatigue. The elderly, children and overweight people are the most vulnerable to heat stress.

In 2020, a Wisconsin man went missing and died of hypothermia near the Delta County Airport during an extreme cold event. Each year, the area experiences periods of frost/freeze in the early part of June. There have been nine significant instances of frost/freeze events between 2005 and 2020 inclusive, but there was no reported crop damage.

Vulnerability: Since temperature extremes impact wide areas, the entire population of the county is at least indirectly affected. Between 2005 to 2020 inclusive, there have been twenty-four instances of extreme or very cold wind and accompanying wind chill; of these, three were extreme cold temperature events. Cold events are likely to occur once or twice a year, though extreme cold is rarer. In some cases, the wind chill has been a deciding factor in the closing or delay of school. Extreme cold temperatures of between negative 30-35°F have been recorded several times in recent years. Mechanical equipment, water pipes (cold weather), livestock, and heating/cooling costs are impacted by an extreme temperature event. Casualties would be limited, but property damage could be significant.

Drought

Hazard description: A prolonged period of deficient precipitation with the potential to damage property and compromise human safety.

RISK: LOW

RANKING: 26TH

Droughts, or prolonged periods of deficient precipitation, are primarily noted for impacting the agricultural sector but can have many far-reaching effects. Impact on human life and property

is generally low. The danger of forest fires is elevated and trees can become stressed during periods of little to no precipitation. Recreation, navigation, waterfowl habitat, aquatic life, groundwater levels and well production can all be adversely affected during periods of drought. Private and public water supplies can be strained due to increased watering of gardens and yards. Less power generation is realized at run-of-the-river hydro projects. Major droughts happen in the area an average of every 20 to 25 years and generally affect a broad area.

Drought conditions are measured using the Palmer Drought Severity Index (PDSI) that is published jointly by NOAA and the U.S. Department of Agriculture (USDA). The PDSI measures the departure of water supply (in terms of precipitation and stored soil moisture) from demand (the amount of water required to recharge soil and keep water bodies at normal levels). Recognizing or predicting drought remains very difficult. Fewer drought events have been reported in recent years, which may be the result of gradual warming leading to higher precipitation due to climate change effects.

The NOAA National Center for Environmental Information last reported moderate drought conditions for Delta County during the Summer of 2012. The Michigan Hazard Analysis, 2019 reports that historic droughts have been recorded in Michigan climate division 2, eastern Upper Peninsula, using the Palmer Severity Index in 1895-96, 1909-11, 1914-15, 1925-26, 1930-31, 1933-34, 1947-48, 1955-56, 1962-64, 1989-90, 1997-99, and 2005-07. The most extreme drought was in October 1948, when the Palmer index hit a record low of -5.65. For drought, the FEMA National Risk Index records that the risk and expected losses for Delta County are very low.

Vulnerability: Tourism and forest production are significant portions of the county economy. Major droughts occur on an average of every 20-25 years. A drought would have an immediate and potentially long-term economic impact in all areas of the county. Elevated wildfire danger would threaten dwellings, especially in rural, forested areas located mostly away from the Lake Michigan shoreline. Agriculture, mostly in the forms of local produce and cattle feed, would also be affected along with livestock.

Earthquakes

Hazard description: A shaking, trembling, or upheaval of the earth's surface caused by volcanic action or bedrock shifting and breaking.

RISK: LOW

RANKING: 34TH

The probability of an earthquake event occurring in Delta County is extremely low. Seismic hazard mapping prepared by the U.S. Geological Survey projects the likelihood of ground motion at two percent in 50 years. This probability rating applies to all areas of the Upper

Peninsula except the Keweenaw Peninsula where the projected probability is four percent in 50 years. Tremors have been recorded in parts of southern Michigan but are rare and have done little damage. Moderate seismic activity was recorded in Menominee in 1905 and 2010, and in the Keweenaw in 1905, 1906 and 1909. A 1925 earthquake in Quebec was felt as far away as Whitefish Point and Newberry. An Ontario-centered earthquake was felt in Sault Ste. Marie in 1944.

Vulnerability: The U.S. Geological Survey places the likelihood of ground motion in the entire Upper Peninsula, except the Keweenaw Peninsula, at two percent in 50 years. There have been no earthquake events recorded in Delta County, therefore the risk of this hazard is low. If an earthquake were to occur, local buildings and infrastructure are not constructed to withstand a significant ground motion. An occurrence, especially if centered near the Escanaba-Gladstone urban area, would affect the largest concentration of people and property.

Other Environmental Hazards

Hazard description: A variety of new or newly-discovered threats to native plants, animals and natural ecosystems.

RISK: MODERATE

RANKING: 24th

Exotic and invasive species and diseases pose serious threats to native animal and plant life. Species that can hide and survive arrive from all over the world on a regular basis. If successfully established, exotics can alter species diversity by eliminating or displacing native species. Adequate control and eradication measures are very costly. The Nature Conservancy estimates that the impact of invasive species in the Great Lakes region costs more than $200 million annually in lost revenue and prevention to United States and Canadian water users within the Great Lakes region. These are very important issues in a natural resource-based county such as Delta.

Forest Infestations

There are many pathogens and insects that threaten native tree species. Each introduces some change to the forest ecosystem. Among the most prominent insect pests impacting area forests are the emerald ash borer, pine shoot beetle and gypsy moth. Beech bark disease and oak wilt are among the regions' most important exotic forest diseases.

Exotic Aquatic Plants

Exotic and invasive plants, such as the prolific purple loosestrife, threaten native wetland vegetation throughout the Great Lakes basin. It has no food value for wildlife. Massive beds of Eurasian watermilfoil make boating and swimming impossible and significantly change the habitat of fish and invertebrates. These are perhaps the best-known exotic aquatic plants that

are affecting native ecosystems. Another, very noticeable widespread invasive species is the wetland phragmites (phragmites australis).

Exotic Fish, Mollusks and Crustaceans

Non-indigenous species have been increasing in numbers and population throughout the Great Lakes and some inland waters. Shipping (ballast water) and unintentional releases are considered the major entry routes. Exotics compete with native fish stocks for food and habitat. Among the species that impact native fish populations are Eurasian ruffe, white perch, sea lamprey, common carp, and several varieties of goby. The zebra mussel, a prolific mollusk, is well established in Lake Michigan and is perhaps best known for clogging surface water supply intakes. Crustaceans, such as the spiny water flea, thrive on the normal food sources of juvenile fish.

Bovine Tuberculosis

Bovine TB is a lung disease that can be transmitted among animals through breathing or nose-to-nose contact. The disease has been found in cattle, goats, bison, elk, and moose. It is believed that this infectious disease is close to being eradicated in the United States. The goal of the Michigan Bovine Tuberculosis Eradication Program is to eliminate bovine TB from cattle and white-tailed deer populations. Currently within Michigan, there are two bovine TB status areas: TB Free status in the Upper Peninsula and most of the Lower Peninsula, and Modified Accredited Zone (MAZ) status in four counties of Northeastern Lower Michigan. Four beef cattle herds were diagnosed as infected with Bovine TB in northeast Lower Michigan in 2020. No cases have been verified in the U.P.

Chronic Wasting Disease

It is known that white-tailed deer, elk and mule deer can be infected with Chronic Wasting Disease (CWD). CWD is related to diseases such as scrapie in sheep, mad cow in cattle, and Creutzfeldt-Jakob (a rare and fatal neurodegenerative disease of unknown cause). There is no current evidence that the disease can infect humans or livestock. The disease is spread through saliva, urine and feces, blood and carcass parts, and infected soil.

Wisconsin has confirmed a large number of white-tailed deer with CWD. In August 2008, Michigan's first case of Chronic Wasting Disease was verified in a white-tailed deer; the three-year doe was a lifelong resident of a captive breeding facility in Kent County. In October 2018, the first case of CWD was found in Dickinson County. Parts of Dickinson and Menominee Counties, and a small portion of Bark River Township in Delta County are currently within the Michigan DNR's U.P. Core CWD Surveillance Area. The extent to which this disease will affect deer and other wild animals is not known. Consuming meat from infected animals is not recommended.

White-Nose Syndrome

White-nose syndrome is a disease that is new to the region that affects hibernating bats. The syndrome causes a fungal infection of the muzzle, ears, and wings of the animals. The disease has an extremely high mortality rate, over 80%, and is devastating to bat populations. The long-term impact of this disease is a decline in the bat population, which may ultimately cause insect populations to increase.

West Nile Virus (WNV)

Humans, horses, many types of birds, and some other animals are susceptible to infection through the bites of infected mosquitoes. Humans usually exhibit mild symptoms or none at all. In rare instances, infected humans can become severely ill and even die. As far as is presently known, the virus cannot be spread from human to human or from animal to human. Michigan reported the first case of WNV in 2002.

There have been 3 confirmed cases of WNV in humans in the Upper Peninsula over the last decade, with the last case in Marquette County in 2019, and a single case last reported in Delta County in 2013. The CDC has recorded 1,318 WNV cases in Michigan between 1999-2019.

Eastern Equine Encephalitis (EEE)

EEE is another mosquito-borne disease that transmits from infected birds through mosquitos to mammals. In humans, the virus causes infection and swelling in the brain, with about a 30% fatality rate and survivors experiencing ongoing neurological symptoms. An outbreak in 2020 saw three human and 41 animal cases in Michigan, with one human case diagnosed in Delta County.

Lyme Disease

Lyme disease is a bacterium passed to dogs (and humans) by the bite of a deer tick. Deer ticks are quite small - about the size of a sesame seed. Portions of the northeast United States and southwestern Wisconsin are considered high-risk areas. The risk in the U.P. is considered low to moderate. Just about any outdoor activity poses some risk. In 2019, there were 276 confirmed Lyme disease cases reported in Michigan.

More than 30,000 infections are recorded in the United States annually. Evidence of infection first appears as a rash and is often difficult to detect. Infected humans will experience joint pain, nervous system, or cardiac symptoms as the disease progresses.

Vulnerability: In Michigan, numerous activities track and mitigate these species and diseases. This includes physician-based active surveillance systems, ecological studies, and laboratory evaluations. These hazards have a high impact on individuals but a low impact on the

community as a whole. As a natural resource-based area, Delta County would feel an economic impact from any alteration or destruction of natural habitat and natural resources.

Vulnerability to Natural Hazards

The table below seeks to show which hazards may effect individual jurisdictions more than others. Most natural hazards can occur in any place; however, they are more likely to occur in the areas outlined based on the analysis of hazards above.

Natural Hazard Vulnerability by Jurisdiction														
	Wildfire	*Urban Flooding*	*Rivervine Flooding*	*Great Lakes Flooding*	*Tornadoes*	*Hail*	Lightning and Thunderstorms	Severe Winds	*Snowstorms*	*Ice and Sleet*	*Temperature Extremes*	*Drought*	Earthquakes	Other Environmental Hazards
Township/City/Village														
Baldwin	X				X	X	X	X	X	X	X	X		X
Bark River	X				X	X	X	X	X	X	X	X		X
Bay de Noc	X			X	X	X	X	X	X	X	X	X		X
Brampton	X		X	X	X	X	X	X	X	X	X	X		X
Cornell	X				X	X	X	X	X	X	X	X		X
Ensign	X			X	X	X	X	X	X	X	X	X		X
Escanaba	X		X	X	X	X	X	X	X	X	X	X		X
Fairbanks	X			X	X	X	X	X	X	X	X	X		X
Ford River	X		X	X	X	X	X	X	X	X	X	X		X
Garden	X			X	X	X	X	X	X	X	X	X		X
Masonville	X		X	X	X	X	X	X	X	X	X	X		X
Maple Ridge	X		X		X	X	X	X	X	X	X	X		X
Nahma	X		X	X	X	X	X	X	X	X	X	X		X
Wells	X		X	X	X	X	X	X	X	X	X	X		X
City of Escanaba		X		X	X	X	X	X	X	X	X	X		X
City of Gladstone		X		X	X	X	X	X	X	X	X	X		X
Village of Garden				X	X	X	X	X	X	X	X	X		X

3.3.2 Technological Hazards

Structural fires, infrastructure failures, and fixed site or transportation-related hazardous materials releases are the most common technological hazards. Most technologic hazards could occur in any jurisdiction, though they are more likely to effect urban areas where people are in closer proximity.

Cyber Security

Hazard description: The protection of hardware, software, and electronic data from theft, manipulation, or disruption.

RISK: HIGH

RANKING: 8th

The increasing reliance on internet-connected devices and services has led to vulnerabilities in a number of critical services and applications that rely on uninterrupted internet connections. Malicious actors have increasingly attacked infrastructure assets and key resources in new and diverse ways that require increased vigilance and ongoing training for cyber security professionals. Cyber attacks can also include the compromise of information security through the theft of personal information or manipulation of authentication services.

Mitigation of cyber security threats involves keeping local hardware and software systems up-to-date against the latest threats, and maintaining awareness from users and the general public in identifying attempts to compromise information security.

Vulnerability: In recent years, several local government systems in other states have been compromised in cyber security attacks. These attacks have involved the takeover of systems using "ransomware" and demands of payment for restoration of access. The U.P. Regional Homeland Security Planning Board is currently assessing cybersecurity needs across the region.

Infrastructure Failure

Hazard description: The failure of critical public or private utility infrastructure resulting in a temporary loss of essential functions and/or services.

RISK: HIGH

RANKING: 7TH

Private and public utility infrastructure is largely taken for granted except when a failure occurs. An interruption in essential utility services such as electricity, communications, transportation, storm water drainage, water, and wastewater systems can imperil life, property, economic activity, and the environment.

Dependence on telecommunication (including wireless) and electric power network sources is increasing. Routine and necessary individual, business and institutional transactions rely heavily, and sometimes exclusively, on these networks. A growing number of people pay bills, bank and shop on-line.

Operating water and wastewater systems in the county are discussed in Chapter 2. About 50 percent of county residents rely on a municipal water system for a potable water source. All areas of the county except Escanaba, Gladstone, Bark River and Rapid River areas utilize private, on-site septic systems.

A reliable source of electricity is vital to homes, businesses, industries and institutions. The American Transmission Company (ATC) owns and operates 69 kV and greater transmission lines serving the area. Midcontinent Independent System Operator (MISO) coordinates, controls, and monitors the use of the electric transmission system. Power throughout the county is distributed by five (5) separate entities via overhead power lines. The Upper Peninsula Power Company (UPPCO) has diesel generating units and three hydroelectric generators in Delta County.

Overhead power lines are subject to weather and other events that can disrupt service. Wind, ice, lightning, falling limbs and trees, and construction and traffic accidents are the most common hazards affecting power transmission. Power outages are common occurrences in the more rural areas. Underground utility lines can be damaged by excavation activities or uprooted trees.

Infrastructure failures can be extremely dangerous affecting people and property, particularly if prolonged, and represent a moderate hazard within the county.

Vulnerability: Public water systems are found in the incorporated areas of Escanaba, Gladstone and Garden and the communities of Rock, Ford River, and Wells. Public wastewater systems serve the Cities of Escanaba and Gladstone, and the communities of Bark River and Rapid River. Failure or contamination of the municipal poses very serious health issues. A water line failure in the City of Escanaba on July 19, 2004 illustrated the propensity of high-impact effects as a result of infrastructure failures. A 16-inch pipe split and sent more than 1 million gallons of water through the ground and into Little Bay de Noc. Escanaba's two 500,000 gallon water towers were emptied and its pipelines were depressurized. While water pressure was restored later that night, city residents and businesses were under a water boil advisory for three days. The OSF St. Francis Hospital, retirement homes, and other health care facilities implemented emergency plans or measures to ensure public health and safety. A limited supply of bottled water was provided to city residents by the City of Escanaba.

In April 2014 a leak occurred in the settling basin at the Escanaba water filtration plant. Pretreated lake water is pumped into the basin to allow settlements to settle to the bottom. Though the crack posed no health hazards and no effect on fire protection, during repair work water was being run through the plant at a lower capacity than normal.

Roads and bridges are essential to county residents. Most transportation failures would be an inconvenience with traffic re-routing as the result. A major transportation system failure would impact business, commerce and services throughout the county.

Prolonged failures of communication, electrical, gas, and other utility infrastructure would have a large impact. Certain populations such as the elderly or persons with specific medical needs are more vulnerable during prolonged communication and utility failures.

Structural Fires

Hazard description: The loss of life and property caused by a structural fire of any origin.

RISK: HIGH

RANKING: 4TH

Most structural fires are caused by human error. Citizen injuries attributable to fire occur every 43 minutes in the United States. About 75 percent of all fire fatalities happen in the home with the leading cause being unintentional or careless action.

According to statistics prepared by the National Fire Protection Association, 73 percent of residential fires occur in single or two-family dwellings. Another 20 percent occur in multi-family structures. Cooking related incidents are the leading cause of house fires, followed by those caused by heating equipment. Most residential fires originate in kitchens. Fire stops were not common to home construction before the mid-1960s. Approximately half of all county housing units were constructed before 1960, and many even earlier, especially in higher-density areas such as downtown Escanaba.

Most of the Delta County fire departments have thermal imaging cameras available to assist in firefighting. Equipment capabilities among departments vary. The training and turnout gear costs for each new member is approximately $3,000. Training and volunteer strengths are issues for local volunteer departments. Some volunteer departments have difficulty maintaining force strength as a volunteer fire fighter requires a considerable time commitment.

Fire prevention programs are provided in all schools. Much of this activity centers on National Fire Prevention Week each October. Institutions such as schools, hospitals, nursing homes, and public housing complexes have evacuation plans and perform drill exercises periodically.

A countywide mutual fire aid agreement exists amongst the fire departments. Mutual aid agreements are also in place with the MDNR and USDA Forest Service.

Vulnerability: Structural fires can be expected to occur every year. There are many potential ignition sources, but most originate as a result of human carelessness.

There are many wooden frame older structures in the county that were constructed before the enforcement of building codes and construction inspection. Nearly half (48.6 percent) of county housing structures were constructed before 1960. Building standards are especially suspect in the case of seasonal camps and cottages which comprise about 13 percent of the total housing units. Wood is used as the principal heating fuel in about six percent of all residential housing units and is commonly used in seasonally-occupied housing units. Heating with wood burning devices carries an elevated risk that is reflected in insurance rates.

Most critical facilities have a sprinkling fire suppression system as well as an evacuation plan should an emergency arise. Commercial and industrial buildings may not have adequate fire suppression systems.

Structural fires are most life threatening when they occur at night when occupants are normally asleep. Where structures are close together, a conflagration is likely as the fire spreads to surrounding buildings. At a minimum, the heat from a well advanced structure fire will affect nearby buildings. Major fires are meant to include commercial, industrial or multiple dwellings.

Response time is central to minimizing fire loss damages. Therefore, camps, cottages, homes or other structures located in remote or isolated areas are more likely to suffer extensive or total loss in a fire event. The suppression capacity of individual fire departments is significantly enhanced by a countywide mutual aid agreement. A large structure fire could impact a large portion of the county due to casualties, temporary loss of utilities; shelter, clothing and food needs; disruption of the transportation network; business closures and economic hardship including job losses.

Dam Failures

Hazard description: Downstream flooding caused by the collapse or failure of an impoundment.

RISK: MODERATE

RANKING: 18TH

Extensive property and natural resource damage can result when a dam structure fails or when its capacity to hold back water is exceeded in a flood event. Maintenance and operation of dam structures are critical to public safety and property protection. Dams in Michigan are

regulated by Parts 307 and 315 of The Natural Resources and Environmental Protection Act, 1994 PA 451 as amended. Part 3215 Dam Safety provides for the inspection of dams. The statute requires the Michigan Department of Environment, Great Lakes, and Energy (EGLE) to rate each dam as either "high," significant" or "low" hazard potential, according to the potential downstream impact if the dam were to fail. The EGLE has identified and rated over 2,400 dams. Dams over six feet in height that impound over five acres are regulated by the state statute.

Dams rated as "*High Hazard Potential*" may cause serious damage to inhabited homes, agricultural buildings, campgrounds, recreational facilities, industrial or commercial buildings, public utilities, main highways or class I carrier railroads, or where environmental degradation would be significant, or where danger to individuals exists with the potential for loss of life.

Dams rated as "*Significant Hazard Potential"* may cause damage limited to isolated inhabited homes, agricultural buildings, structures, secondary highways, short line railroads, or public utilities, or where environmental degradation may be significant, or where danger to individuals exists.

There are 24 dams and impoundments in Delta County. All but two are rated "low hazard" by the Michigan Department of Environment, Great Lakes, and Energy with inspections required every five years. Escanaba River #4 Dam (Cornell Township at Boney Falls) and Escanaba River #3 Dam (Escanaba Township, just south of County Road 420 and Reno Creek) are rated "high hazard" and must be inspected every three years. Dams receiving high hazard ratings are upstream of populated areas. Structures rated as significant or high hazards are required to have emergency action plans (which include functional exercises) coordinated with the local emergency official.

Seepage occurs with all impounded water. The seepage will follow paths of least resistance through or around a dam and its foundation. Adequate monitoring and control of seepage velocity and quantity are critical. Several years ago, the Escanaba River #4 dam was found to have a minor seepage problem. In response, the reservoir levels were temporarily lowered for safety and UPPCO improved the dam embankments in order to mitigate the problem.

Vulnerability: Low risk dams and impoundments are found well distant from population concentrations and critical facilities. Failures would result mainly in streambank erosion and habitat disturbance with little threat to humans. There are no recorded events of dam failure within the county, however, dam failure is still considered a potential hazard.

The impacts of a failure at Escanaba River Dam #3 and Dam #4, rated as high hazards, are dependent on whether the failure took place under fair weather (normal flow conditions) or flood conditions. The following information was derived from the Delta County Emergency

Action Plans for Dams #3 and #4:

A fair weather failure of dam #3 would impact residences, a campground and other development along the Escanaba River below the dam. Dam failure under flood conditions would impact residences and other structures along with the failure of downstream dams.

Failure of Dam #4 would be expected to cause significant damage under fair weather or flood conditions. Fair weather failure would impact over 60 structures and a few bridges though downstream dams would not be damaged. Under flood conditions over 180 structures and all downstream bridges, dams, and Billerud (previously Verso) plant buildings would expect damage.

Nuclear Power Plant Accidents

Hazard description: An actual or potential release of radioactive material at a commercial nuclear power plant or other nuclear facility in a quantity great enough to pose a threat to the health and safety of an off-site population.

RISK: LOW

RANKING: 35th

Nuclear power plants are strictly regulated by the federal government. Each facility must develop appropriate emergency plans. An accidental release of radioactive materials to the environment could affect public health and safety in some locations under certain weather conditions. However, the probability of a nuclear plant accident affecting Delta County is low since such facilities are of a distance and location (prevailing wind direction) that any released material would be dispersed in relatively harmless quantities. The nearest operating commercial reactors are along the Lake Michigan shoreline southeast of the city of Green Bay. Delta County is well outside of the 50-mile ingestion pathway zone for the Kewaunee Power Station (located in Carlton, Kewaunee County, WI) and slightly further for Point Beach Nuclear Plant, located just south near Two Rivers, Manitowoc County, WI. The Kewanee Power Station is currently being decommissioned.

Vulnerability: Delta County is somewhat isolated from the potential effects of a nuclear plant accident both in terms of distance and wind direction.

Radiation contamination from a power facility accident would affect the health of people, plants and animals. In the Ingestion Pathway Zone, an approximate 50-mile radius around a plant, mitigation efforts would focus on the effects on agriculture, and food processing and distribution. Incidents at the nuclear power plants along the Lake Michigan shoreline could

negatively affect the waters in the Bay of Green Bay. Evacuation may be necessary and could have long-lasting impacts, such as rendering the area uninhabitable.

Subsidence

Hazard description: Downward movement of land surface caused by human-induced activities that have weakened or removed subsurface support.

RISK: LOW

RANKING: 33rd

Most incidents of subsidence in Michigan are the result of underground mining. Other human-induced activities resulting in subsidence are groundwater withdrawal and drainage of organic soils. The dissolution of soluble materials such as limestone by groundwater can create underground cavities that weaken subsurface support enough to cause a lowering or collapse of the ground surface. Sand, gravel, and limestone are mined at many locations in the county.

Vulnerability: Underground cavities from the dissolution of limestone by groundwater are known to exist on the Garden Peninsula. Since the peninsula is underlain by limestone, subsidence of locations near roads and existing development is possible. However, there are no records of collapse of roads or structures due to dissolution of limestone. There is no known underground mining activity recorded in the county, so probability of subsidence is low. Gravel, sand, and limestone mining operations are isolated and distant from population concentrations. Property damage losses are highly unlikely.

Scrap Tire Fires

Hazard description: The accidental combustion of scrap tires at a designated storage area.

RISK: LOW

RANKING: 32nd

Dealing with scrap tires in the waste stream is difficult and costly. Landfilling tires is not allowed. Storage areas may not contain more than 500 tires. The major concerns with scrap tire storage are that they create mosquito breeding areas (which is related to West Nile Virus; see above) and fire hazards.

The Delta Solid Waste Authority landfill charges to accept scrap tires according to size. Tires are shipped to Wisconsin by semi trailer for shredding and reuse. Much of the shredded material is used for fuel in paper mills.

Vulnerability: There has been one recorded scrap tire fire in Delta County occurring in the spring of 1989. Escanaba Public Safety responded to a blaze at stockpiled tires (less than 1,000 tires) at the former Stropich Concrete Company on county road 426 in Wells Township; the fire

was extinguished within a day. Fire departments now have specialized equipment and training in fighting such fires. In the event of another such fire, it would be isolated to a specific site such as an automobile service center or salvage yard (which are generally located away from residences) and would produce lots of heat and acrid smoke. Adjacent property would be endangered and evacuation of people would be required, but impact to the community as a whole would be low.

Hazardous Materials Incidents

Hazardous materials in quantities of concern are common in most communities. If released, a risk to life, health, environment and property is possible because of the chemical, physical, or biological nature of the material. Regulatory measures apply to the manufacture, transport, storage, use, disposal and accidental release of hazardous materials.

Hazardous Materials - Fixed Site

Hazard description: An uncontrolled release of hazardous materials from a fixed site capable of posing a risk to life, health, safety, property or the environment.

RISK: HIGH

RANKING: 6TH

Those facilities having threshold quantities of extremely hazardous substances (EHS) on site are subject to reporting requirements set forth under federal statute (SARA Title III, Section 302). There are currently eleven such facilities in the county. Offsite emergency response plans along with a general description of each chemical are on file with the Local Emergency Planning Committee (LEPC). Descriptions include chemical properties, response recommendations, health hazards, and other information to assist responders. Smaller quantities of hazardous materials are commonplace and include corrosive and incendiary products such as agricultural chemicals, cleaning agents, solvents, etc. There are 40+ current TIER II reporting sites in the county.

A large de-propanization facility along the natural gas pipeline near Rapid River, owned by Plains Midstream, extracts products from the Enbridge pipeline to produce propane and then injects unused byproducts back into the pipeline. If an incident were to occur at this facility, a large area of the surrounding community would be affected which includes residential and commercial areas. Flammable and pressured gasses are reportable under TIER II requirements, and the facility has a dedicated emergency response plan on file with local agencies.

Several methamphetamine labs and dump sites have been discovered in Delta County in the past several years. The product and its production process are extremely hazardous and have led to the condemnation of several structures. The Upper Peninsula Substance Enforcement Team (UPSET) is a multi-jurisdictional task force that investigates and responds to meth lab and

dump sites.

A storage tank leak of liquid chlorine dioxide at the Escanaba paper mill in June 2005 resulted in the evacuation of the plant and nearby residences. The leak was contained within eight hours; four people were treated for symptoms associated with the gas. In July 2019, a leak in a sanitary sewer force main at the mill spilled approximately 12,000 gallons of contaminated water into the Escanaba River. In August 2020, a failure in a wastewater pipe at the mill created a fish kill lower downstream in the Escanaba River. The fish kill was reported by local residents, and it was unknown how long the leak of "black liquor", a by-product of the pulping process, had been occurring.

Accidents resulting in fires or explosions at industrial facilities can cause a release of harmful substances. Flooding and severe weather can cause an unintended release as well.

Vulnerability: There are currently 11 facilities listed as 302 sites that are subject to State of Michigan emergency planning requirements in Delta County. These sites are listed in table 3-9 (page 38). Most of the facilities are located in moderately to intensively developed areas of Escanaba, Gladstone, and Rapid River. An accident involving these sites would have a moderate impact on the economy and safety in Delta County. The remaining TIER II facilities are dispersed throughout the county in mostly rural areas with low population densities.

Past hazmat accident information regarding the facilities is not known. If a spill did occur, the hazardous material would most likely cause damage to the immediate area of the facility only. Evacuation would be limited to the facility. Containment and cleanup of the spill would require a hazmat team. A major fire at these facilities would be a bigger concern. Evacuation of a minimum half-mile radius around the site would be needed due to the possibility of toxic or corrosive gases and explosion. There are 40+ sites within the county that have smaller quantities of hazardous materials. There are higher risks for spills and fires at these sites. Some of these are active in emergency planning efforts with local agencies.

Hazardous Material Transportation

Hazard description: An uncontrolled release of hazardous materials or substances during air, land, or water transport.

RISK: HIGH

RANKING: 1ST

Surface transportation accidents include road, rail and water. While such transportation is reasonably safe, accidents inevitably can occur many ways with many different characteristics and conditions. Existing roadways are becoming more crowded with increasing traffic volumes.

Federal regulations pertaining to the transport of hazardous materials has been incorporated into state law thereby making it compulsory for both interstate and intrastate transportation. Employers are responsible to train, test and certify all employees involved with shipping or transporting of hazardous materials. All shipments must list product name, hazard class, DOT #, and emergency information on a manifest. Special permits are required for the transport of medical waste and hazardous waste (EGLE) and, depending on quantity, U.S. Department of Transportation registration is necessary to transport hazardous material. Placarded vehicles are required to stop at railroad crossings; escorts are required at both the Mackinac and Ambassador bridges.

Hazardous materials being transported bear one of ten classification placards. It is likely that all pass through the county at some time, but records are not available for the public. A brief description of each class follows (it should be noted that placard classifications are subject to revision):

- Class 1 represents explosives which are further classified according to sensitivity, projection and fire hazard characteristics.
- Class 2 includes gases further defined as flammable, non-flammable and compression, and poisonous.
- Class 3 includes flammable and combustible liquids.
- Class 4 includes flammable solids further defined as flammable solids, spontaneously combustible material, and those that become dangerous if wetted.
- Class 5 includes oxidizers and organic peroxides further defined into subcategories.
- Class 6 represents poisons and may be poisons or infectious substances.
- Class 7 represents radioactive material.
- Class 8 includes corrosives.
- Class 9 involves miscellaneous materials not included in other classes.
- ORM-D (other regulated material) has a limited hazard potential because of its form, quantity, or packaging; usually these are consumer commodities.

Commercial trucks sometimes carry multiple types of hazardous material in a single transport. Placards are required only for those materials of a reportable quantity. In the event of an

accident, first responders would likely not have knowledge of all hazards involved.

Proper maintenance, loading and operation of commercial vehicles is critical. Heavy trucks use air brakes exclusively and generate drum temperatures to 600° F. Uneven loads or a faulty brake system can push drum temperatures as high as 1,000° F, which is extremely dangerous. Tankers less than three-fourths full are considered dangerous due to instability caused by "sloshing". Diesel fuel is hard to ignite, but the volume carried aboard large trucks can cause a big problem if ignition does occur.

Vehicle

While hazardous material in transit could be released anywhere along the route of travel on any day of the year, it is more likely to occur at an intersection or in a high traffic area. The heaviest traffic volumes in the County are found within the urban areas of Escanaba and Gladstone. Michigan Department of Transportation traffic count data (2020) shows an average of over 18,000 vehicles traveling the Escanaba-Gladstone (US-2/41/35) corridor per day. Higher traffic volumes are found within the City of Escanaba up to the Escanaba River Bridge. The commercial traffic volume between Escanaba and Gladstone averages over 1,200 vehicles per day.

A tanker truck accident at Sylvan Point on M-35 south of Escanaba occurred in 1988. The accident resulted in a spill of diesel fuel and pollution of adjacent Lake Michigan marsh via a storm drain.

Commercial trucks regularly park in the Wal-Mart lot on Lincoln Road in Escanaba while the drivers take breaks. In August 2013, a semi-truck transporting polyphosphoric acid leaked a small amount of material while parked in the Wal-Mart lot due to a faulty container. Not realizing this, the driver continued on to his destination in Gladstone, resulting in additional minor leakage. Public safety crews promptly cleaned up the materials, and the event had minimal impact on the community. Incidents like this are rare as containers carrying hazardous materials are regularly inspected for leaks, but as this instance illustrates, they could potentially happen at any time due to human error. Impact is localized and the extent varies depending on the type of material leaked.

Countywide, traffic crash data from the Michigan Office of Highway Safety Planning reported 1,087 crashes in 2020. One of the crashes resulted in fatalities and 141 had personal injury, with most involving property damage. While many of the crashes occurred on city streets, 453 accidents occurred on US highway and 173 accidents happened on a state highway. Many of the crashes that have occurred along the US 2/US 41/ M 35 corridor in Escanaba and Wells Township have been rear-end straight crashes. More traffic crashes in general would result in a higher probability of hazardous material release during transport. A study commissioned by

the Michigan Department of Transportation in 2009 presented suggestions to improve access management to reduce the potential for traffic crashes.

There is no public record on the number of commercial vehicles that are carrying hazardous materials. Therefore, the vulnerability analysis of this hazard is somewhat limited. However, areas with higher traffic volumes such as the City of Escanaba and the US-2/41/35 corridor have a higher probability of hazardous material release due to transportation accidents.

Rail

The Federal Railroad Administration (FRA) reported there were an average of 2.59 accidents per million train miles in the United States over the past 10 years. Derailments accounted for 57 percent of the accidents. The most common accident cause is attributable to human action (46 percent); 34 percent of the accidents resulted from track defects. 3 percent of the accidents were caused by signal defects. Nationwide, there have been 155 train accidents between 2012-2021 that resulted in the release of hazardous materials.

Statistics from the FRA report almost 19,656 incidents at highway-rail crossings between 2012-2021. These incidents resulted in 2,300 fatalities. The FRA reports that highway-rail and trespassing incidents account for 95% of all fatalities.

Rail service is provided by two railroads: the Canadian National Railroad and the Escanaba and Lake Superior Railroad. The approximate average number of cars per year carrying regulated hazardous material along specific segments is as follows:

Gladstone - Trout Lake	-100 (Canadian National)
Escanaba - Partridge (Marquette Co.)	- 27 (Canadian National)
Powers - Larch (Wells)	- 147 (Canadian National)
Larch - Gladstone	- 123 (Canadian National)

Railroad routes roughly follow alongside US-2 and North M-35 in Delta County. The Federal Railroad Administration data reports there were 12 train accidents in Delta County between 2004 and 2012; of those eleven were derailments. From 2013-2020, there was only a single train accident involving a vehicle at a crossing in 2019. For the years 1975 to 2003 there were 64 railroad accidents with two injuries. There were no train accidents that resulted in the release of hazardous materials, although there is anecdotal evidence that small spills occur. However, based on hard data, there is a low probability of future occurrence.

Other

Air transportation accidents are rare. Air traffic at the Delta County Airport includes commercial passenger and freight, as well as private and charter aviation. Commercial

passenger boardings in 2019 totaled 19,063; due to COVID-19 travel restrictions, enplanements in 2020 numbered 8,204, a 56% difference. Delta County Airport also handled over 1 million pounds of air cargo in 2019 and 2020.

Air and water port shipping is limited in the county. Accidents involving air and commercial and pleasure watercraft present an extremely low probability. Accidents involving personal watercraft, snowmobiles, and all-terrain vehicles are numerous and typically involve only the operator with little collateral impact.

Vulnerability: Hazardous materials accidents can happen by air, land, or water transport. Air transportation hazmat accidents are possible to some degree but are very rare. Barge/tanker transport in the county handles materials such as iron ore, aggregate, coal, etc. The biggest threat is through transportation of hazardous materials over land by truck or rail. Impact is localized and magnitude of severity depends on the type of materials leaked. With a central location in the region and several major highways, Delta County is most at risk of an incident through vehicle transport.

Pipeline Failures

Hazard description: An uncontrolled release of product(s) from pressurized pipelines lying above or below the ground.

RISK: MODERATE

RANKING: 17TH

Leaks or eruptions from natural gas or petroleum pipelines can have very serious consequences in a community including injuries and loss of life, environmental degradation, and economic hardship. Pipeline accidents are largely the result of excavation not related to operation and maintenance of the pipeline itself. Interstate pipelines are strictly regulated and essential to the economical transport of petroleum and natural gas.

A one-inch high pressure natural gas service line punctured inadvertently by a construction crew in Minnesota resulted in an explosion that destroyed six buildings, killed four persons and injured several others. The accident happened in late 1998 with resulting property losses estimated at about $400,000.

Major natural gas and natural gas liquid (NGL) transmission pipelines traverse the northern part of the county in an east-west direction. Two 36-inch diameter lines carry natural gas along a parallel route. Enbridge Energy owns and maintains a 30-inch line which carries natural gas liquids (NGL) that when released to the atmosphere change to gas and are extremely flammable. The Enbridge pipeline that runs through Delta County is part of the system that failed and spilled into the Kalamazoo River in Comstock, MI 2010, resulting in a $765 million

cleanup cost. While probability is low, incidents can have a large impact on the community depending on the spill location (water body vs. fixed site) and impose large costs.

A large de-propanization facility along the pipeline in Rapid River, owned by Plains Midstream, extracts products from the Enbridge pipeline to produce propane and then injects unused byproducts back into the pipeline. If an incident were to occur at this facility, a large area of the surrounding community would be affected which includes residential and commercial areas.

Vulnerability: Major pipelines cross the county roughly following highway trunklines. The pipeline routes are buffered somewhat from populated and developed areas. However, several cross rivers and could spill into the water, resulting in a high cleanup cost. An explosion or rupture could lead to casualties, infrastructure damage, transportation interruptions (rail and trunkline), local road closures and select area evacuations.

3.3.3 Social Hazards

The hazards associated with human behavior cannot be predicted with scientific certainty, or even in terms of probabilities. However, past events document that unruly human actions happen in many forms and under a variety of circumstances. The potential for loss of life and property is not less serious with hazards of this type.

Civil Disturbance

Hazard description: A public demonstration, gathering, or prison uprising that results in a disruption of essential services and is characterized by unruly or unlawful behavior.

RISK: LOW

RANKING: 28TH

There are no instances of civil unrest in the county documented in the historical record. However, a single action can trigger such an event.

None of the State of Michigan's 28 active correctional facilities are in Delta County. Prison security levels range from Level V (highest) to Level I (easily managed prisoners). The 156-bed Delta County Correctional Facility houses both male and female prisoners. Sentences for less serious crimes or first-time offenders may be served in halfway houses or through home confinement monitored electronically.

Labor disputes, especially if prolonged, are highly emotional and can result in violent behavior. Unauthorized stoppages occurred several times at the former P&H truck crane plant in Escanaba and prompted law enforcement surveillance. A labor contract impasse in the late 1970s at St. Francis Hospital was an acrimonious situation that local law enforcement monitored.

Public meetings or proceedings dealing with controversial issues carry an elevated risk of unruly behavior. This includes meetings at every level of government and places where decisions affecting individuals are rendered such as courtrooms and regulatory/compliance agencies. Demonstrations for or against something are usually peaceful but can transform to unruly quickly under certain circumstances. Celebrations are generally associated with some special accomplishment that joins people together. Normally celebrations are peaceful and fun for the participants but can get out of hand - particularly if the partying involves alcohol consumption.

Vulnerability: While no such incidents are found in the historical record, a single highly emotional issue can quickly trigger a disturbance. The population base of the county is relatively stable; it is also aging rapidly. In the unlikely event that such a disturbance was to occur, crowd control capacities could be challenged. Casualties and property damage would be limited to a specific area of the county and a small percentage of the population. Extent, impact, and probability are all low for this hazard.

Terrorism, Sabotage, WMD

Hazard description: Intentional, unlawful and subversive action(s) against persons and property to further political, social or religious objectives through intimidation and coercion.

RISK: LOW

RANKING: 30TH

Until the attacks of September 11, 2001, acts of terrorism were associated almost exclusively with other parts of the world. Besides injuring and killing people and destroying property, such acts are intended to instill fear and uncertainty on the targeted population. Places that attract large numbers of people might be the targets of choice for terrorists. Traditional terrorist targets are schools, universities, public buildings, public infrastructure, controversial businesses, media locations, and large gatherings. The introduction of contaminants to food and water sources is another means of affecting large numbers of people. Weapons could be nuclear, chemical, biological, or informational. Motives could be racial, ethnic, religious, environmental, policy, or anarchical. Weapons and motives vary but the themes of fear and hate always apply.

A major terrorist action in an urbanized area could trigger an influx of people into the county in search of safety and quiet. A large and rapid population convergence on the county could strain local resources, possibly to a dangerous level.

The regionalized Rapid Response Team Network (RRTN) and can be activated by either a call from the Michigan State Police or the Federal Bureau of Investigation and can respond to specialized events in this nature. The Upper Peninsula region headquarters is in Ironwood, three hours west of Escanaba.

Vulnerability: Aside from prank bomb threats at local schools, there is no record of terrorist acts in the county.

Places where large numbers of people congregate or are housed such as schools, churches, nursing homes and the hospital would be most affected by an act of terrorism although the means and location of an action could impact any area of the county. Though acts of terrorism propose a low probability of future occurrence in Delta County, they are possible and carry the potential for significant harm to humans and property. Impact and extent would depend on structures targeted and weapons used.

Bioterrorism

Hazard Description: Terrorism involving the release of toxic agents.

RISK: LOW

RANKING: 29TH

Bioterrorism can be overt or covert and involve the dispersion of disease pathogens. Germ warfare is very difficult to defend against and places new and demanding responsibilities on the public health system and primary healthcare providers. Anthrax (*Bacillus anthracis*), botulism (*Clostridium botulinum*), plague (*Yersinia pestis*), smallpox (*Variola major*), tularemia (*Francisella tularensis*), and viral hemorrhagic fevers (ebola and others) are the highest priority agents (Category A).

Category A diseases/agents have the following characteristics:

- easily transmitted from person to person
- high mortality rates and potential for major impact
- potential to incite public panic
- require special preparedness measures

Category B diseases/agents are less easily spread and less likely to cause illness or death. These include the poison ricin, bacterial food and water safety threats, and many others.

Third highest priority diseases/agents (Category C) include emerging infectious threats from pathogens such as hantavirus. Category C agents are considered easy to produce and introduce, as well as highly effective in terms of causing illness and death.

In 1993, a local building code inspector was intentionally exposed to ricin (Category B). A rental unit owner who had been cited for building safety violations perpetrated the exposure. The person was identified, convicted and sentenced to a prison term.

An awareness of bioterrorism has grown with anthrax and sarin threats.

Vulnerability: While not thought of as a widespread possibility, one bioterrorist event, involving ricin exposure to one person, did occur in the county. Probability of future occurrence is low. A large percentage of the population could be affected if an agent was introduced where large numbers of people congregate or through public water supplies. High casualties and elevated community anxiety would be likely.

Public Assembly Events

Hazard description: Publicized congregations of people, admitted with or without fee, and held for entertainment, enrichment, socialization or education purposes.

RISK: LOW

RANKING: 31st

Public gatherings are important for all sorts of reasons. The movement of people to, from and within such events can temporarily overload ingress, egress and control capacities and create a hazardous situation. Large congregations that involve alcohol consumption or illegal drug use are more likely to experience property damage and personal injuries. The history of public events in the county suggests a low-level risk to humans and property.

Large assembly events occur year-round and include those in Table 3-8.

Table 3-8
Annual Large Assembly Events, Delta County

Name of Event and Description	Location	Month
Caring for Our Elders Traditional Pow-Wow	Escanaba	March
Holy Name School Carnival	Escanaba	April
Memorial Day parade and festivities	Rapid River	May
Krusin Klassics Fun Run	Escanaba	June
Fourth of July celebrations	Gladstone, Escanaba, Bark River, Nahma	July
Upper Peninsula State Fair	Escanaba	August
U.P. Off-Road Rumble	Bark River	August
Waterfront Arts Festival	Escanaba	August
Labor Day parade and festivities	Rock	September
Labor Day festivities	Nahma	September

Table 3-8
Annual Large Assembly Events, Delta County

Name of Event and Description	Location	Month
Steam and Gas Engine Show	Escanaba	September
Fayette Fall Fest	Fayette State Park	October
Christmas Parade	Escanaba	December
Christmas in the Village	Escanaba	December
Wells Sports Complex (Ice arena/indoor turf)	Wells Twp.	various
School functions (sports events, music and theatrical presentations, other extra-curricular)	various	various
Other functions (summer concerts, charity events, fishing tournaments, RV rallies, motorcycle rallies, Logging Congress, etc.)	various	various

Vulnerability: Numerous large public gatherings are held throughout the year. Most are family-type events that attract people of all ages. Events are held throughout the county but are most often held in Escanaba. Law enforcement activity is at a level ordinarily expected with such events. Vulnerability is present in any such situation with large crowds and heavy traffic. Attendees, assembly site and adjoining properties could be harmed. Effective crowd and traffic control capacity is limited.

School Violence

Hazard description: Rowdy, threatening, unlawful, or otherwise aberrant behavior within educational facilities.

RISK: MODERATE

RANKING: 15TH

The reported incidents of serious school violence over the past decade have increased. Multiple shooting incidents at various school locations around the nation have resulted in the implementation of new security and preventative measures. According to studies, students who feel they have been bullied, threatened, injured, or otherwise treated badly are the most likely to carry out serious acts of violence.

As required by Public Act 102 of 1999 schools are to report certain incidents which occur on school property, on school sponsored transportation, or at a school sponsored activity. This categorical listing of crimes is intended to help schools and communities to develop appropriate prevention programs.

Bomb threats have occurred in local schools and have required law enforcement resources to investigate. All of the local bomb threats to date have been hoaxes. Early and day-long closures were necessary as buildings were swept by law enforcement personnel and specially trained dogs when available.

Vulnerability: All Delta County schools have recorded incidents of crime as defined by PA 102. Some incidents have resulted in referrals to court. No known weapon offenses have resulted, but elevated concern exists in view of tragic events and cultural changes across the nation.

School violence events could affect one or several persons. Property damage would generally be limited to school structures and equipment. Depending on the severity, school violence could have extensive effects in the community causing fear and anxiety. The county Emergency Management Coordinator meets with local school administration at least twice a year to discuss school security and response; schools also perform drills related to hazards including violent events throughout the year.

Workplace Violence

Hazard description: Rowdy, threatening, unlawful, or otherwise aberrant behavior within places of employment.

RISK: MODERATE

RANKING: 14TH

Workplace violence is a serious and deadly hazard. Incidents of assaults or threats to employees or supervisory personnel by discharged, disgruntled, or otherwise emotionally unbalanced employees seem to be on the rise. Incidents can be triggered by many things including racial differences, lifestyle preferences and romantic involvements. Tragic incidents of workplace violence have spawned a variety of resources aimed at early interdiction to underlying causes.

A workplace connection was involved with a July 2003 murder-suicide in the county. Incidents of workplace violence in the county consist mainly of threats and harassment, but much of the information is anecdotal only. There have been no recent instances of workplace violence.

Vulnerability: The 2003 murder-suicide and anecdotal evidence of threats and harassment with workplace connections suggest this hazard should be monitored. However, for the most part, citizens seem to interact with one another in acceptable manners and know their co-workers and neighbors. An incident would typically affect the victim(s) and have little impact on property. Incidents of workplace violence heavily impact the community in terms of mental well-being.

Active Shooter

Hazard description: An individual actively engaged in killing or attempting to kill people in confined and/or populated areas.

RISK: Moderate
RANKING: 13th

Active shooter events are largely unpredictable and are usually perpetrated by individual actors using firearms or other weapons. Active shooters tend to target areas that have either large gatherings of people, such as schools, festivals, or churches, or that they have some personal connection to, like a workplace, school, or agency. The randomness of attacks and targets make active shooter events difficult to predict or mitigate.

Vulnerability: Incidents of active shooter events are absent from the public record in Delta County. The county does have large events and schools that could possibly be targets for such an attack. Law enforcement personnel should have training related to these events, and local schools have implemented response plans.

Mass Casualities

Hazard description: An event that overwhelms the local healthcare system, where the number of casualties exceeds the local resources and capabilities in a short period of time.

RISK: Moderate
RANKING: 19th

Mass casualty incidents can occur in the wake of any disaster listed in this document and can be concurrent to disaster response. Incidents can involve the quick triage, treatment, and transport of a large number of injured persons, and require the collaboration and coordination of local entities. The local Medical Control Authority for emergency medical services assumes responsibility for communication and response measures.

Vulnerability: OSF-St. Francis Hospital maintains the Delta County Medical Control Authority and the response plans for mass casualty incidents. In the event of an incident, a process is in place to notify local stakeholders and coordinate response. This process is updated regularly in coordination with the Michigan Department of Health and Human Services. A mass casualty incident is rare, however, their unpredictability and occurrence with other disasters makes preparation most important.

Public Health Emergencies

Hazard description: Incidents of contamination or epidemic that present a clear danger to the general health and well-being of the public.

RISK: HIGH

RANKING: 5TH

Disease epidemics, contaminated water supplies, instances of food poisoning, and chemical, biological or radiological exposures are among the many potential causes of a public health emergency. Public health emergencies can occur as the result of a primary disaster such as a severe storm, flooding, or release of hazardous material. Normally such occurrences are confined within a locality. However, widespread impact is possible with contagious diseases.

Food processing provides multiple opportunities for contamination through accidental or intentional action. Food service workers are required to report specific illnesses and are required to not work if afflicted with certain contagious diseases. To safeguard diners, licensed kitchens must designate a "person-in-charge" to oversee food preparation. High employee turnover in the food service industry makes it difficult to insure that proper training has been completed in all cases. Sanitary conditions at food establishments are inspected regularly by public health officials.

Exposure to certain types of hazardous material may require special decontamination measures before transporting the victim to a medical clinic or hospital. Identification of the contaminant is necessary. Typically, first responders - many of whom are volunteers - need extensive training in how to identify hazardous materials and appropriately respond to hazardous material releases. Transportation capacity is limited to the number of rescue vehicles within the coverage area.

The West Nile virus (discussed in Environmental section) is spread by mosquito bites and can cause encephalitis or meningitis. An incubation period is from 3 to 15 days, and many people exhibit no symptoms before fully recovering. Of the people who become ill from the virus, infection case-fatality rates range from 3% to 15% and are highest among the elderly.

Public water supplies are monitored by state health officials. Private wells are sampled when new, to comply with loan requirements, or as deemed necessary by the owner. Wells not properly encased and grouted are more susceptible to contamination - especially in areas where limestone bedrock and little overburden are present.

New and emerging public health issues place a tremendous burden on local health agencies.

Vulnerability: Virtually the entire county population is susceptible to disease or epidemic. A greater concern exists for elderly and very young children. A major outbreak would stress existing medical capacities and have a negative impact on the community as a whole. The concern about property would be with contamination that might result in special decontamination measures, if possible, or destruction if decontamination measures are not possible. The COVID-19 pandemic strained county resources through mitigation and response efforts from different agencies. Through the pandemic, local agencies learned to coordinate response and tracking, and may be better prepared for a future occurrence.

Economic Recession/Adversity

Hazard description: A situation characterized by business downturns and closings and severe labor force reductions.

RISK: LOW

RANKING: 27TH

Employment base losses due to closure or relocation and serious business downturns - especially if prolonged - can cause tremendous hardship and pressure on a community and its people. Desperation can lead to uncharacteristic and destructive behavior. An area is likely to experience population losses during hard times as people move to areas with better employment prospects. As disposable personal income dwindles, local businesses will find it more difficult to remain in operation. Moreover, as private and public investments wane, the physical condition of structures and infrastructure will likely degrade.

In 2008 an economic bubble in the value of housing burst, leading to a large recession, from which it took several years to recover. Economic losses due to the Coronavirus Pandemic have yet to be fully realized.

The last severe and prolonged economic period was the Great Depression that began in the late 1920s. With lifestyle changes, technology, and a plethora of assistance programs, it is unlikely that those extreme difficulties will be repeated. In addition to the 13.3 percent of county residents whose incomes fall below government poverty levels, there are many individuals and families that are perilously close to the poverty level.

Businesses can be destroyed by most any type of disaster. Unfortunately, most businesses store vital records on-site. Anecdotal information indicates that if a business is forced to close due to a disaster, there is a 50 percent chance that it will not reopen.

Vulnerability: Economic issues have a far-reaching effect. A prolonged economic slump, closure of a major employer, or a collapse of the financial market would impact nearly all persons living in the county. A decrease in property values, business, employment and

investment would occur commensurate with the severity of the economic situation. A corresponding increase in the need for services could be expected that would exceed local capacities. Economic hardship is likely to continue to be an issue.

Transportation Accidents

Hazard description: Unintended events associated with any mode of transportation that brings harm to people and/or property.

RISK: MODERATE

RANKING: 12TH

Trunklines pass along and near population concentrations. Development continues to occur along corridors, a situation that creates more access points and traffic flow disruptions. Michigan statistics indicate that the highest incidence of vehicle crashes and fatal vehicle crashes occurs between noon and 6:00 p.m. Further, the crash, injury, and death rate is highest along county and city roads. A 5-year ranking (2015-2019) of Michigan's 83 counties by the number of injuries causing death or incapacitation puts Delta at 65th overall. Although traffic accidents occur frequently, they have a low impact on the community as a whole. The extent of damage depends on the severity of the accident, number of individuals involved, numbers of vehicles, and the value of vehicles and property involved.

Manifestations of anger on the nation's roadways in recent years have been widely reported. Incidents of "road rage" have resulted in injuries and fatalities. Behavior of this sort reflects a lack of consideration for the safety of others, plus an unwillingness or inability to control personal emotions. This behavior may also reflect frustration with a more difficult transportation environment. Anecdotal information indicates that this behavior is less common with older drivers. Statistically, drivers between the ages of 25-34 are involved in the most fatal accidents.

Recreational transportation by means such as boats (paddle, power, and sail), snowmobile, off-road vehicle, and road and mountain bikes results in injuries and deaths each year. Most serious injuries and fatalities involve snowmobile and off-road vehicles. Generally, the consequences of these accidents are limited to the user(s) and the recreational apparatus.

The Federal Railroad Administration (FRA) reported there were on average 2.59 accidents per million train miles in the United States over the past 10 years. Derailments accounted for 57 percent of the accidents. The most common accident cause is attributable to human action (46%); 34 percent of the accidents resulted from track defects. 3 percent of the accidents were caused by signal defects.

Statistics from the FRA report almost 19,656 incidents at highway-rail crossings between 2012-2021. These incidents resulted in 2,300 fatalities. The FRA reports that highway-rail and trespassing incidents account for 95% of all fatalities.

Canadian National Railroad lines shadow the routes of trunklines US-2 from the east to Gladstone, US-41 from the west to the Pine Ridge area, and M-35 from the north to Escanaba. The line from the north is most important because it connects Marquette County iron ore mines to the Escanaba ore dock on Little Bay de Noc. In addition, some pelletized ore is shipped directly by rail to a steel mill in Sault Ste. Marie, Canada. The largest customer for Canadian products is the U.S. which makes the linkage at Sault Ste. Marie through Delta County and onto major markets a vital trade route.

The Escanaba and Lake Superior Railroad is headquartered in Wells. Its trackage that follows the route of CR426 from the Marquette County line to the Billerud Escanaba paper mill is not active. Some track, however, is used for car storage. The railroad provides local service to Billerud.

The ports of Escanaba and Gladstone handle a variety of bulk materials including iron ore, limestone and other aggregate, coal, salt and bituminous. A fuel storage facility remains active at the Gladstone port.

Commercial air service is available at the Delta County Airport. Commercial passenger boardings in 2019 totaled 19,063; due to COVID-19 travel restrictions, enplanements in 2020 numbered 8,204, a 56% difference. Delta County Airport also handled over 1 million pounds of air cargo in 2019 and 2020. The airport property is designated as a business renaissance zone, and has several businesses in its surrounding industrial park.

Vulnerability: There were 1,087 vehicle accidents in Delta County during 2020, with 77% involving a passenger car. The second most predominate type of vehicle was the pickup truck (30%). Trucks were involved in less than three percent of the crashes. The traffic crashes in 2020 resulted in one fatality and 141 persons injured. There were 945 crashes that resulted in property damage only. The total costs of injury, death, property damage, and response personnel to the scene are an unknown dollar amount.

The Michigan Office of Highway Safety Planning database shows that slightly more than a quarter of the crashes occurred within the City of Escanaba. Twelve percent of the crashes in 2020 occurred within Wells Township. A significant number of accidents occur within the Escanaba-Wells Township corridor; this area also has a higher concentration of intersections, access points and population. The Average Daily Traffic volume for the US-2/ US-41/ M-35 segment along north Lincoln Road and Wells Township averages nearly 20,000 vehicles per day.

As traffic volume, access points (development), and driver impatience increase, so does the probability of serious accidents.

Railroad routes in the county follow alongside US-2 and M-35 North. The Federal Railroad Administration data states there were 12 train accidents in Delta County between 2004 and 2012, of those eleven were derailments. From 2013-2020, there was only a single train accident involving a vehicle at a crossing in 2019.

The probability of accidents involving air and commercial and pleasure watercraft are extremely low. Accidents involving personal watercraft, snowmobiles, and all-terrain vehicles are numerous and typically involve only the operator with little collateral impact.

3.4 Identified Hazards with Affected/Vulnerable Facilities

Throughout Delta County there are a number of critical services/facilities that are potentially vulnerable or at risk to be affected by identified hazards. Table 3-9 presented below identifies both the number of such facilities and the names of the facilities. Table 3-10 shows which facilities/services are potentially at risk or would be affected by identified hazard for the county.

Table 3-9 Identified Facilities		
Delta County Critical Facilities		
Type and Number of Facilities	**Name**	**Location**
1 Hospital	OSF St. Francis Hospital	3401 Ludington St., Escanaba (city)
1 Health Department	Public Health, Delta & Menominee Counties	2920 College Ave., Escanaba (city)
16 Police/Fire Departments	Delta County Sheriff Department	111 N. 3rd St., Escanaba (city)
	Escanaba Public Safety	1900 3rd Ave. N., Escanaba (city)
	Gladstone Public Safety	144 4th Ave. NE., Gladstone (city)
	Michigan State Police	922 Lake Shore Dr., Gladstone (city)
	Baldwin Twp. VFD	5901 Perkins 30.5 Rd., Perkins
	Bark River Twp. VFD	4309 D Rd., Bark River
	Brampton Twp. VFD	9019 Bay Shore Dr., Gladstone
	Cornell Twp. VFD	9794 Boney Falls H Rd., Cornell
	Ensign Twp. VFD	24th Rd., Rapid River
	Escanaba Twp. VFD	4618 Co 416 20th Rd., Flat Rock
	Ford River Twp. VFD	3845 K Rd., Bark River
	Garden Twp. VFD	243 Gardens Ave., Garden
	Masonville Twp. VFD	10584 N. Main St., Rapid River
	Nahma Twp. VFD	9661 GG Rd., Rapid River
	Tri-Township VFD	4042 E. Maple Ridge, Rock (Maple Ridge Twp.)
5 Emergency Medical Services	Rampart EMS	828 Sheridan Rd., Escanaba (city)
	Masonville Twp. VFD	10584 N. Main St., Rapid River
	Rock Community EMS	14376 Hwy M-35, Rock (Maple Ridge Twp.)
	Tri-Star EMS	9425 00.25 Rd., Cooks (Garden Twp.)
	Guardian Flight	3401 Ludington St, Escanaba (city)
2 Solid Waste Facilities	Delta County Landfill	5701 19th Ave., Escanaba (city)
	Escanaba Paper Co. Landfill	7100 Co Rd 426, Escanaba (Escanaba Twp.)
1 Prison/Jail Facility	Delta County Sheriff Department	111 N. 3rd St., Escanaba (city)
Delta County Public Infrastructure		

6 Municipal Water Systems	Escanaba	1 Water Plant Rd., Escanaba (city)
	Gladstone	22 Delta Ave., Gladstone (city)
	Garden	243 Garden Avenue, Garden (village)
	Nahma	Located at off of County Road 499 in the NE ¼, SW ¼, SE ¼, Sec 24, T40N, R23W (Nahma Twp.)
	Maple Ridge/Rock	14639 Chapel Lane, Rock (Maple Ridge Twp.)
	Ford River	Located off of L.15 Lane in the NW ¼, SE ¼ SW ¼ Sec. 15, T38N, R23W (Ford River Twp.)
	Riverside Manor	10570 N. Main St., Rapid River (Masonville Twp.)
4 Municipal Wastewater Systems	Escanaba	1900 Willow Creek Rd., Escanaba (city)
	Gladstone	41 Minneapolis Ave., Gladstone (city)
	Bark River	1445 12th Rd., Bark River (Bark River Twp.)
	Rapid River	10574 N. Main Street, Rapid River (Masonville Twp.)
5 Electrical Service Providers	Cloverland Electric Cooperative	2916 W. M-28, Dafter (Chippewa Co.)
	Alger-Delta Cooperative Electric Association	426 N. 9th St., Gladstone (city)
	City of Escanaba	1711 Sheridan Rd., Escanaba (city)
	UPPCO	600 E. Lakeshore Dr., Ste. 206, Houghton (Houghton Co.)
	Wisconsin Energies	231 W. Michigan St., Milwaukee, WI
1 Natural Gas Provider	DTE Energy	1 Energy Plaza, Detroit, MI
1 Commercial Airport	Delta County Airport	3300 Airport Rd., Escanaba (city)
2 Rail Service Providers	Lake Superior & Escanaba Railroad	1 Larkin Plaza, P.O. Box 217, Wells Twp.
	Canadian National Railway	935 de la Gauchetiere St. W., Montreal, Quebec, Canada
1 Port	Port of Escanaba	P.O. Box 948, Escanaba (city)
4 Telephone (landline) Service Providers	AT&T	1034 N. Lincoln Rd., Escanaba (city)
	Spectrum	401 N. 30th St., Escanaba (city)

	Hiawatha Telephone	108 W. Superior St., Munising (Alger Co.)
	Century Link	116 S. Maple St., Manistique (Schoolcraft Co.)
4 Cell Phone Service Providers	Cellcom	2354 10th Street, Menominee (Menominee Co.)
	Verizon	314 N. Lincoln Rd., Escanaba (city)
	AT&T	1034 N. Lincoln Rd., Escanaba (city)
	Spectrum	401 N. 30th St., Escanaba (city)
5 Internet Service Providers	DS Tech	1431 N. 26th St., #101, Escanaba (city)
	Spectrum	401 N. 30th St., Escanaba (city)
	AT&T	1034 N. Lincoln Rd., Escanaba (city)
	UPLOGON	1801 7th Ave. N., Escanaba (city)
Delta County Educational Facilities		
14 Public School Buildings	Escanaba Area Schools	Lemmer Elementary, 700 S. 20th St., Escanaba (city)
		Webster Elementary, 1213 N. 19th St., Escanaba (city)
		Escanaba Upper Elementary School, 1500 Ludington St., Escanaba (city)
		Escanaba Jr. High School, 500 S. Lincoln Rd., Escanaba (city)
		Escanaba Sr. High School, 500 S. Lincoln Rd., Escanaba (city)
	Gladstone Area Schools	Cameron Elementary, 803 29th St., Gladstone (city)
		J. T. Jones Elementary, 400 S. 10th St., Gladstone (city)
		Gladstone Middle School, 300 S. 10th St., Gladstone (city)
		Gladstone Area High School, 2100 M-35, Gladstone (city)
	Bark River-Harris Schools	Elementary, Jr. and Sr. High School, US-2, Harris (Menominee Co.)
	Mid-Peninsula Schools	K-12 School, 5055 St. Nicholas 31st Rd., Rock (Baldwin Twp.)
	Rapid River Public Schools	K-12 School, 10070 US-2, Rapid River (Masonville Twp.)

	Big Bay de Noc School	K-12 School, 8928 00.25 Rd., Cooks (Garden Twp.)
2 Private Schools	Escanaba SDA Christian School	210 S. Lincoln Rd., Escanaba (city)
	Holy Name Catholic School	409 S. 22nd St., Escanaba (city)
1 Alternative Education	Bay Middle College	2001 N. Lincoln Rd., Escanaba (city)
3 Head Start Centers	Escanaba	507 1st Ave. N. Escanaba (city)
	Gladstone	207 S. 12th St., Gladstone (city)
	Rapid River	10070 US-2, Rapid River (Masonville Twp.)
1 Vocational Education	Delta-Schoolcraft ISD	2525 3RD Ave, Escanaba (city)
	Delta-Schoolcraft ISD	Soo Hill, 5219 18th Rd., Escanaba (Wells Twp.)
1 Post-Secondary Education	Bay de Noc Community College	2001 N. Lincoln Rd., Escanaba (city)
Extremely Hazardous Materials (302 Sites)		
11 Hazardous Materials Sites	AT&T	11503 M-35, Gladstone (Baldwin Twp.)
	Escanaba Co.	1005 1st Ave. S., Escanaba (city)
	Escanaba Wastewater Plant	1900 Willow Creek Rd, Escanaba (city)
	Escanaba Water Plant	1 Water Plant Rd, Escanaba (city)
	Gladstone Generating Station	21 Delta Ave, Gladstone (city)
	Charter Communications	401 N 30TH St, Escanaba (city)
	New Cingular Wireless	9248 EE 25 Rd, Rapid River (Masonville Twp.)
	Nutrien Ag Solutions	5053 County 420 21 Rd, Gladstone (Escanaba Twp.)
	Omya PCC	7100 County Rd 426 M.5 Rd, Escanaba (Wells Twp.)
	Rapid River CDO	10483 Wisconsin Ave, Rapid River (Masonville Twp.)
	Billerud (previously Verso) Escanaba LLC	7100 County Rd 426 M.5 Rd, Escanaba (Wells Twp.)

Table 3-10 Affected Facilities	
Identified Hazard	**Affected/Vulnerable Facilities & Infrastructures**
Ice & Sleet Storms	Electrical service providers, telephone service providers
Snowstorms	Electrical service providers, telephone service providers
Severe Wind	Electrical service providers, telephone service providers
Lightning & Thunderstorms	Electrical service providers, telephone service providers
Tornadoes	All facilities and infrastructures
Temperature Extremes	Water systems, wastewater systems
School Violence	Educational facilities
Wildfires	Rapid River School, Governmental buildings
Infrastructure Failures	Water systems, wastewater systems, electrical service providers, telephone service providers
Drought	Water systems
Public Assembly Events, Civil disturbances	Educational facilities, government buildings
Structural Fires	Governmental buildings, Educational facilities
Hail	All buildings and facilities
Transportation Accidents	Roadways
Flooding	Water systems, Wastewater systems, Governmental buildings, Bridges, Roadways, and Railroads
Pipeline failures	Water systems
Earthquakes	All facilities and infrastructure
Nuclear power plant accidents	All buildings and facilities with human population
Subsidence	All facilities and infrastructure
Economic recession/adversity	All facilities and infrastructure
Public health emergencies, bioterrorism	All facilities and infrastructure
Cyber security	All facilities and infrastructure

3.5 Declared Disasters in Delta County

There have been five declared disasters in Delta County as shown in Table 3-11.

Table 3-11
Declared Disasters in Delta County

Disaster Number	Declaration Date	Incident Type	Description
3035	3/2/1977	Drought	Drought
3057	1/27/1978	Snow	Blizzards & Snowstorms
1028	5/10/1994	Snow	Severe Deep Freeze
3225	9/7/2005	Hurricane	Hurricane Katrina Evacuation*
4494	3/27/2020	Biological	COVID-19 Pandemic (ongoing)

*Refers to the federal disaster aid that was made available to Michigan to supplement its efforts to assist evacuees from areas struck by Hurricane Katrina. Source: FEMA Declared Disasters, https://www.fema.gov/disaster/declarations

4.0 IDENTIFY AND PRIORITIZE STRATEGIES

The Hazard Analysis results outlined in Chapter 3 helped guide meetings with the Local Emergency Planning Committee (LEPC) in Delta County that produced the specific issues, goals, and strategies in this chapter. Using the Hazard Analysis results as guidance and qualitative analysis, the LEPC selected the issues and complementary mitigation strategies in 4.1 as priorities for Delta County.

Since the previous Hazard Mitigation Plan update, Delta County has identified new hazards and re-prioritized existing hazards in order to create mitigation strategies that meet the needs of the present and future. The hazards outlined in this chapter continue to be those identified as the highest-risk in this and previous plan editions. Severe weather, hazardous materials transportation and fixed-site storage, structural fire, public health, infrastructure, and cybersecurity have all been identified has local hazards to address. Since the previous plan, mitigation strategies related to flooding have decreased in priority, while infrastructure and cybersecurity have increased due to frequency of occurrences nationally. These hazards have contributed to the identification of possible mitigation strategies, which are described below, and an action plan detailed in Chapter 5.

4.1 Issues, Goals, and Strategies

4.1.1 Severe Weather

Issues: Severe winter weather (snowstorms, ice and sleet) and weather associated with thunderstorms (high winds, lightning) are seasonal hazards in Delta County. Winter whiteout driving conditions have occurred along US-2 near Garden Corners. Ice and sleet storms may pose a risk to property, but can also result in dangerous driving conditions and impact utility services. Overhead power lines are subject to weather and other events that may disrupt service.

Goal: Improve the capacity of Delta County to respond to and prepare for severe weather-related incidents by investing in equipment, education, and infrastructure that can mitigate the effects of severe weather in all seasons.

Strategies:

- Maintain coverage of the NOAA Weather radio tower.
- Increase use of NOAA Weather Radios through community awareness and education programs. Purchase and distribute additional NOAA radios.
- Explore the possibility of instituting and the practical use of a countywide emergency notification system through smartphone applications.
- Institute a public education program regarding emergency warning systems.

- Bury/protect power and utility lines in critical locations.

- Identify existing shelter locations, strengths, and weaknesses. Correct shelter weaknesses by updating equipment, providing adequate generators, and establishing shelters for vulnerable populations.

- Update and/or expand public education efforts for emergency preparedness through the County website, newsletters and press releases.

- Maintain adequate road and debris clearing capabilities.

- Explore the establishment and implementation of a "reverse 911" calling system in Delta County.

- Have a system in place to facilitate the immediate response to ice jams on rivers.

- Provide portable pumps for use at municipal fuel pumping facilities and designated gas stations throughout the County.

- Provide emergency generators for use at all school facilities and the county airport.

- Coordinate the lease of large construction equipment from local companies during their off-season to provide additional capacity for snow removal.

- Ensure that local first responders and Delta County Search and Rescue have appropriate equipment to respond to emergencies that occur during inclement weather.

- Coordinate with county road commission, MDOT, and utility providers to create an aggressive tree and brush removal strategy along trunkline roads to prevent blockages from debris.

- Purchase mobile signage to warn drivers of hazardous roadway conditions when present.

4.1.2 Hazardous Material Release and General Transportation Accidents

Issues: Heaviest traffic volumes in the County are found in the Escanaba-Gladstone urban area, which is a route for transport of hazardous materials. The US-2/41 corridor has a high concentration of intersections, access points and population. The top five accident locations within the county are located in the city of Escanaba. A past tanker truck accident on M-35 resulted in the spill of diesel fuel and pollution to adjacent Lake Michigan. Railroad routes roughly follow alongside US-2 and M-35 north near to residences. Hazardous materials in transit can be accidentally released anywhere along these routes.

Goal: Minimize the possibility of a Hazardous Material accident and general transportation accidents in Delta County. Institute measures to increase the County's ability to deal with such incidents.

Strategies:

- Institute training, planning and preparedness for hazmat and general transportation incidents on roadways and railways.
- Ensure fire departments and other first responders have adequate training and equipment to respond to hazmat accidents.
- MDOT, road commissions and local governments should continually examine and identify problem roadways and intersections. Improve the design of such locations to alleviate the situation and/or install appropriate traffic controls.
- Develop/update evacuation plans of facilities and of the communities. Confirm that first responder, fire departments and law enforcement agencies are aware of such plans.
- Continue to train and equip local hazardous materials emergency response teams.
- Construct connector roads to reduce congestion of arterial roads.
- Explore the establishment and implementation of a "reverse 911" calling system in Delta County.
- Ensure first responders, county road commission, and local public works personnel have adequate training and equipment for spill control at hazardous materials accidents.
- Utilize a geographic information system to map storm sewers, spillways and residential wells throughout the county.
- Install signs to denote the actual speed of vehicles traveling on a roadway.
- Develop a system of alternative routes to detour traffic away from hazardous material spills while maintaining a reasonable traffic flow.
- Identify possible roadway pinch points and alternative traffic routes along rural areas of US-2.

4.1.3 Fixed Site Hazardous Material Release

Issues: There are 11 facilities in the county with extremely hazardous substances subject to the SARA Title III reporting requirements. There are other sites with lesser quantities of other hazardous substances. A leak of liquid chlorine dioxide at the Billerud (previously Verso) paper mill in 2005 resulted in evacuation of employees and nearby residences.

Goal: Reduce the potential for hazardous materials fixed site incidents in the County and increase the County's ability to deal with such incidents. Create and maintain an inventory of hazardous sites that could create potential response issues.

Strategies:

- Develop/update site emergency plans for SARA Title III sites.
- Inventory exempt SARA Title III sites.
- Regularly conduct exercises of site emergency plans and community response plans.
- Ensure fire departments and other first responders have adequate training and equipment to respond to hazmat accidents.
- Continue to train and equip local hazardous materials emergency response teams.
- Explore the establishment and implementation of a "reverse 911" calling system in Delta County.
- Utilize a geographic information system to map storm sewers, spillways and residential wells throughout the county.
- Ensure fire departments complete the requirements under the SARA Title III "Right-to-Know" program.
- Invite Department of Homeland Security, other emergency agency personnel, to participate in local exercises with hazardous material release components.

4.1.4 Structural Fires

Issue(s): There are 19,786 housing units in the county, with just under half (44**%**) constructed before 1960; fire stops are not common to pre-1960 homes. Building codes generally require public buildings and businesses over 12,000 square feet to have sprinkler system. Wood is a primary heating source for about 9.8% of the homes in Delta County.

Goal: Reduce the County's losses from structural fires by seeking updated equipment and training for local fire departments, implementing and inspection of fire-related infrastructure, and continuing fire education opportunities

Strategies:

- Install or upgrade sprinkler systems in commercial or high-density residential use buildings, schools, churches, and other buildings where large masses of people congregate.

- Continue to implement a countywide fire training program.

- Continue mutual aid agreements among the various fire departments.

- Ensure fire departments and other responders have adequate equipment and training to respond to structural and commercial fires.

- Train personnel in facilities where large numbers of people congregate in the use of fire extinguishers and other fire safety procedures.

- Update site emergency plans for schools, factories, office buildings and other appropriate sites.

- Institute regular inspections of commercial, industrial, multi-family residential use buildings, day care facilities, churches, and other buildings where large groups of people congregate.

- Support recruitment, equipment procurement, and training of volunteer firefighters to ensure that departments have adequate personnel to respond to incidents.

4.1.5 Public Health

Issues: A public health emergency event in Delta County would affect large portions of the population. Medical, public health, and other agencies may not be fully prepared and/or capable of handling this type of event. Public Health, Delta & Menominee Counties are continually updating their plans and monitoring public health issues.

Goal: Increase the County's capability to prepare and respond to public health emergencies. Build on and maintain lessons learned from the COVID-19 pandemic to mitigate the impact of potential future events.

Strategies:

- Implement and continue to provide countywide training and equipment to respond to a public health emergency.

- Develop a database and keep current a listing of volunteers that can assist during a major public health event.

- Provide back-up generators for water and wastewater treatment facilities, the county airport, and the county jail to maintain acceptable operating levels during power failures.

- Increase public awareness of the causes, symptoms, and protective actions for disease outbreaks and other potential public health emergencies.

- Develop and continue to update existing plans to cover possible public health emergency events.

- Develop a communication strategy that analyzes what information, best practices, and possible improvements can be taken from response to the COVID-19 Pandemic and implement these into revised plans and practices.

- Purchase storage space to create a local inventory of personal protective equipment (PPE) and other response materials for immediate use when emergencies occur.

4.1.6 Infrastructure Failures

Issues: Infrastructure in the form of electrical, gas, water and wastewater services, and telecommunications equipment are vulnerable to failures often related to severe weather. The cities of Escanaba and Gladstone have both water and wastewater systems, and Rapid River and Bark River have connections to larger systems in Gladstone and the Hannahville Indian Community, respectively. Electrical power is provided through five service providers through high-voltage lines traveling across the county. Natural gas service is provided in the Escanaba-Gladstone area and natural gas pipelines roughly parallel US-2 through the county. Telecommunications are supplied through a number of providers. An interruption of service to any of these vectors would cause inconvenience or endanger residents, particularly in winter months.

Goal: Identify vulnerabilities related to the interconnected infrastructure network and seek to mitigate the impact of prolonged interruption of services upon the population.

Strategies:

- Ensure public works departments and county road commission are prepared to respond to water main breaks.

- Collaborate with utility providers to communicate and coordinate outage response plans, identify vulnerabilities, and help mitigate issues.

- Purchase portable generators to provide temporary power to critical facilities.

- Promote redundancy in the construction or remodeling of critical facilities.

- Train first responders to anticipate failures of interdependent systems and develop response plans accordingly.

- Include dam failures in local exercises and in related emergency action plans.

4.1.7 Cyber Security

Issues: The increasing reliance of internet-connected devices and services has led to vulnerabilities in a number of critical services and applications that rely on uninterrupted internet connections. Training and the implementation of software and hardware are important to thwart attacks from malicious actors. Small local governments and agencies are particularly vulnerable to these attacks without mitigation.

Goal: Establish an education campaign and develop training opportunities for local units of government and agencies to mitigate the possibility of service interruptions created by cybersecurity vulnerabilities.

Strategies:

- Provide training and resources to local governments, agencies, and businesses for cybersecurity.

- Develop a communications strategy to promote the need for cybersecurity training for local businesses and critical agencies and infrastructure.

- Add cybersecurity elements to local exercises and emergency action plans.

- Build an incident response and recovery plan for cybersecurity attacks to local systems or reaction to cybersecurity attacks to critical facilities.

- Send periodic test emails to government employees to determine vulnerabilities and address weaknesses.

- Establish an off-site backup and security plan for to support recovery and reconstitution of systems and data.

4.2 Evaluation Criteria

Criteria were developed which utilize a system of points for strategies that affect large or small portions of the county, recurring hazards, property damage, cost effectiveness, and natural resources. Larger point values were given to strategies that: affect large groups of people, mitigate recurring hazards, attempt to reduce property damage countywide, are cost-effective to implement, and use local resources. The results of this process are described in Section 4.3 Mitigation Strategies.

Table 4-1 Evaluation Criteria	Points
The project/alternative protects the health, safety, and general welfare of the greatest number of residents (countywide, at least half the population, less than half the population).	25 - 15 - 5
The project/alternative mitigates a recurring problem.	20
The project/alternative is intended to reduce property damage to structures community-wide.	15
The project/alternative is intended to reduce property damage to selected areas of a community.	10
The project/alternative is cost effective for the community.	20
The project/alternative can be implemented using only local resources (100% local resources, less than 100%)	10 - 5
The cost of the project/alternative does not exceed the anticipated cost of probable damage (if an event occurs).	5
The project/alternative is intended to protect the area's natural resources. (forests, surface water, etc.)	5

4.3 Mitigation Strategies - Ranking

Below are the results of using the evaluation criteria in 4.2 to weight the hazard mitigation strategies discussed in Section 4.1- Issues, Goals, and Strategies.

Table 4-2 Strategies by Rank Score (2007)	Points
Develop/update site emergency plans for SARA Title III sites.	95
Regularly conduct exercises of site emergency plans and community response plans.	95
Maintain adequate road and debris clearing capabilities.	90
Institute training, planning and preparedness for hazmat and general transportation incidents on roadways and railways.	90
Insure fire departments and other first responders have adequate training and equipment to respond to hazmat accidents.	90
MDOT, road commissions and local governments should continually examine and identify problem roadways and intersections. Improve the design of such	90

Table 4-2 Strategies by Rank Score (2007)	Points
locations to alleviate the situation and/or install appropriate traffic controls.	
Continue to train and equip local hazardous materials emergency response teams.	90
Maintain facility and community training and exercise programs.	90
Institute an emergency warning system with a distinct, unique sound to be associated with a specific accident or disaster.	90
Ensure county road commission and local public works personnel have adequate training and equipment for spill control at hazardous materials accidents.	90
Explore the establishment and implementation of a "reverse 911" calling system in Delta County.	90
Maintain and continue use of NOAA Weather Radio weather tower coverage.	90
Increase use of NOAA Weather Radio through community awareness and education programs.	90
Institute a public education program regarding emergency warning systems.	90
Seek funding from public and private sources to maintain and improve/expand emergency warning systems in communities throughout the County.	90
Ensure fire departments and other responders have adequate equipment and training to respond to structural and commercial fires.	90
Continue mutual aid agreements among the various fire departments.	90
Develop/update evacuation plans of facilities and of communities. Confirm that first responder, fire departments and law enforcement agencies are aware of such evacuation plans.	85
Construct connector roads to reduce congestion of arterial roads.	85
Utilize a geographic information system to map storm sewers, spillways and residential wells throughout the county.	85
Purchase and distribute NOAA radios.	85
Maintain and improve/expand emergency warning systems in communities across the County. (Ex. sirens)	85
Continue to implement a county-wide fire training program.	85
Update site emergency plans for schools, factories, office buildings and other appropriate sites.	85
Install lightning protection devices on communities' communication and utility infrastructure.	80
Install signs to denote the actual speed of vehicles traveling on a roadway.	80
Continue with training of and provide for the increased use of weather spotters.	70
Bury/ protect power and utility lines	70
Install or upgrade sprinkler systems in commercial or high density residential use buildings, schools, churches, and other buildings where large masses of people congregate.	65
Inventory exempt SARA Title III sites.	65
Use snow fences or living snow fences to limit blowing and drifting snow over	60

Table 4-2 Strategies by Rank Score (2007)	Points
critical roadway segments.	
Update and/or expand public education efforts for emergency preparedness through the county website.	55
Correct shelter weaknesses by updating equipment, providing adequate generators, and establishing shelters for vulnerable populations.	50
Identify existing shelter locations, strengths, and weaknesses.	45
Have a system in place to facilitate the immediate response to ice jams on rivers.	10

Based on information provided in the hazard mitigation plan and discussions at the local committee meetings, the following new strategies are added to the 2014 update of the Plan.

Table 4-3 Strategies To Be Included in the 2014 Update Hazard Mitigation Plan	*Points*
Increase public awareness of the need for permits (EGLE Part 31) for building in flood plain areas.	105
Enforce basic building code requirements related to flood mitigation.	105
Encourage local governments to participate in the National Flood Insurance Program.	105
Lake Michigan shoreline communities (Ford River, Wells, Brampton, Masonville, Ensign and Bay de Noc townships, and cities of Escanaba and Gladstone) and Delta County should continue to be active partners with FEMA as the agency proceeds to complete the Risk MAP (Mapping, Assessment and Planning) study.	105
Utilize flood risks products developed by FEMA to become more informed of mitigation actions to reduce identified flood risks.	105
Develop a system of alternative routes to detour traffic away from hazardous maternal spills while maintaining a reasonable traffic flow.	100
Ensure that fire departments have adequate equipment and training to respond to wildfires.	100
Implement and continue to provide countywide training and equipment to respond to a public health emergency.	100
Provide back-up generators for water and wastewater treatment facilities to maintain acceptable operating levels during power failures.	100
Use check valves, sump pumps, and backflow preventers in homes and buildings.	95
Develop a database, and keep current a listing of volunteers that can assist during a major public health event.	95
Develop and continue to update existing plans to cover possible public health emergency events.	95
Identify escape and entry routes in areas with high wildland fire risk.	90
Identify natural fire breaks where wildland fires might be intercepted and contained.	90
Increase public awareness of the causes, symptoms, and protective actions for disease outbreaks and other potential public health emergencies.	90
Provide local training to officials on flood mitigation measures, flood plain management, flood proofing, etc.	85

Table 4-3 Strategies To Be Included in the 2014 Update Hazard Mitigation Plan	*Points*
Construct elevated or alternative roads that are unaffected by flooding, or making roads more flood-resistant through better drainage and/or stabilization/armoring of vulnerable shoulders and embankments.	85
Provide emergency generators for use at all school facilities and the county airport.	70
Institute public education of flood warning systems.	70
Provide portable pumps for use at municipal fuel pumping facilities and designated gas stations through the county.	65
Acquire drainage easements in order to allow for the planned and regulated public use of privately owned land for temporary water retention and drainage.	70
Ensure that fire departments have adequate equipment and training to respond to flood conditions.	70
Institute a public education program regarding emergency flood warning systems.	60
Improve/update accurate flood plain mapping of communities.	55

Based on conversations with the Emergency Management Coordinator and the results of exercises with the LEPC and input from local units of government, the following strategies were included for the 2021 plan update.

Priority	Table 4-4 Strategies for the 2021 Hazard Mitigation Plan Update	Points
1	Support recruitment, equipment procurement, and training of volunteer firefighters to ensure that departments have adequate personnel to respond to incidents. (Structural Fire)	100
2	Develop a communications strategy to promote the need for cybersecurity training for local businesses and critical agencies and infrastructure. (Cyber Security)	100
3	Collaborate with utility providers to communicate and coordinate outage response plans, identify vulnerabilities, and help mitigate issues. (Infrastructure Failure)	95
4	Train first responders to anticipate failures of interdependent systems and develop response plans accordingly. (Infrastructure Failure)	95
5	Purchase mobile signage to warn drivers of hazardous roadway conditions when present. (Severe Weather)	90
6	Purchase storage space to create a local inventory of personal protective equipment (PPE) and other response materials for immediate use when emergencies occur. (Public Health)	90
7	Coordinate with county road commission, MDOT, and utility providers to create an aggressive tree and brush removal strategy along trunkline roads to prevent blockages from debris. (Severe Weather)	80
8	Develop a communication strategy that analyzes what information, best practices, and possible improvements can be taken from response to	80

	the COVID-19 Pandemic and implement these into revised plans and practices. (Public Health)	
9	Explore the possibility of instituting and the practical use of a countywide emergency notification system through smartphone applications. (Severe Weather)	70
10	Invite Department of Homeland Security, other emergency agency personnel, to participate in local exercises with hazardous material release components. (Hazardous Materials)	70
11	Ensure that local first responders and Delta County Search and Rescue have appropriate equipment to respond to emergencies that occur during inclement weather. (Severe Weather)	65
12	Identify possible roadway pinch points and alternative traffic routes along rural areas of US-2. (Hazardous Materials/General Transportation)	65
13	Build an incident response and recovery plan for cybersecurity attacks to local systems or reaction to cybersecurity attacks to critical facilities. (Cyber Security)	65
14	Add cybersecurity elements to local exercises and emergency action plans. (Cyber Security)	55
15	Coordinate the lease of large construction equipment from local companies during their off-season to provide additional capacity for snow removal. (Severe Weather)	45

4.4 Administrative Means to Accomplish Mitigation

As part of the planning process, mitigation strategies were developed to reduce potential losses of natural hazards identified in the risk assessment. The strategies present methods for local jurisdictions to improve upon existing tools.

Local mitigation capabilities are existing authorities, policies, programs and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities.

Planning and regulatory capabilities are plans, policies, codes and ordinances that prevent and reduce the impacts of natural hazards. These preventive measures are designed to protect new development from hazards and ensure that potential loss is not increased. A number of preventive measures can be implemented at the local level, including:

- Building codes
- Planning and Zoning
- Subdivision regulations
- Open space preservation
- Storm water management

Building Codes are an effective way to address many of the natural hazards identified in the plan. Through building code enforcement all new and improved building are to be built or rehabilitated to withstand the impacts of certain hazards, such as snow loads, high winds, extreme temperatures and flooding. Under the State Construction Code Act (Act 230 of 1972), as amended in 1999, municipalities are required to administer and enforce the statewide building, plumbing, mechanical and electrical code. Local communities are not permitted to modify the state codes. In Delta County, the County Building and Zoning Department is responsible for building code enforcement for the county, with the exception of the City of Gladstone; Gladstone city has their own building inspector. The County Building Department handles all of the mechanical and plumbing permits within the County. Electrical code enforcement is handled through the State of Michigan.

Planning and Zoning guides appropriate development based on suitability and compatibility, keeping development away from sensitive areas such as floodplains, and wetlands and protecting property from certain types of natural hazards. Master plans are utilized by local governments to guide future development within their community. A community's future development is accomplished through the local planning process that reviews a community's background, current land use, and projected needs. The master plan is to serve as the basis for regulating land use. Zoning regulations are the primary tool to implement the master plan recommendations. Zoning places restrictions on lot size, use, setback, etc. Through the different zoning districts, the community can effectively guide development. The townships of Baldwin, Bay de Noc, Brampton, Cornell, Ensign, Fairbanks, Garden, Maple Ridge, Nahma and Wells are under the provisions of the Delta County zoning ordinance. The townships of Bark River, Escanaba, Ford River, and Masonville and the cities of Gladstone and Escanaba have enacted their respective zoning ordinances. The village of Garden is currently unzoned. Within the county, master plans have been adopted by the jurisdictions with zoning provisions.

Land Division (Subdivision) Regulations stipulate that all divisions of property be approved by the local unit of government. The act regulates the division of land in order to promote the public health, safety and general welfare. Review of property to assure the orderly layout, use of the land, and require the land be suitable for building sites and public improvements, etc. A number of communities in the county, including cities of Escanaba and Gladstone and the townships of Brampton, Ensign, Fairbanks, Bay de Noc, Ford River, Garden, Masonville, Nahma and Wells have enacted individual subdivision control ordinances.

Open Space Preservation methods are used to keep hazardous areas from development and is especially useful in flood prone areas. Prohibiting new development in hazard-prone areas is the best way to mitigate future problems. An additional benefit to open space preservation is the maintenance of agricultural and green space/park areas. The planning process can assist in identifying suitable areas to preserve.

Storm Water Management is a method to control both urban and riverine flooding. Natural groundwater serves to absorb water, urban development attributes such as paving and

sidewalks tend to increase runoff and cause flooding, overloaded drainage systems, erosion, and impaired water quality. Participating NFIP communities have minimum requirements in the floodplain to mitigate future losses.

Administrative and technical capability of the jurisdiction is the community's staff and skills used in mitigation planning and to implement specific mitigation actions. The larger jurisdictions employ engineers, planners, building inspectors, and grant writers to implement mitigation activities in the community. The smaller, more rural communities typically do not have those resources available and must rely on the expertise and technical expertise of the county for emergency managers, floodplain management and building inspectors.

Local emergency services authorities, resources and facilities throughout Delta County are identified in Chapter 2 of the plan. All the authorities are effective in conducting and responding to incidents. Several agencies are deficient in terms of having the necessary equipment to maintain and expand their responsibilities. The same shortfall of resources is found in municipal public work agencies and planning departments. Continued inadequate funding sources will compound the problem.

Suggested ways to improve and expand upon hazard mitigation efforts are:

Building Codes:

- An expanded method of communication between code enforcement agencies and local contractors and property owners will ensure that builders are incorporating all of the current standards and requirements.

Planning and Zoning:

- Communities with master plans should review the document and take appropriate steps to update the plan in accordance with state law. Several localities are in the process of updating their respective master plans. Communities should review their plans and incorporate hazard mitigation discussion and techniques in the plans.

Land Division (Subdivision) Regulations:

- A majority of jurisdictions in the county have enacted a subdivision control ordinances. Most jurisdictions have land division ordinances. Communities should examine whether enactment of a subdivision control ordinance is appropriate for their jurisdiction.

Open Space Preservation:

- Open space preservation can be achieved through a number of means including acquisition, donation by developer's easement or regulated setback buffers or through provisions contained in the community zoning ordinance. Communities

are encouraged to review these techniques and adopt provisions that are suitable for their situation.

Storm Water Management:

- Existing storm water management programs could be expanded to require storm water does not leave a new development at a higher rate than pre-development conditions. In addition, the storm water regulations can utilize natural vegetation, buffers, and retention basins to minimize impacts within the watershed. A coordinated effort amongst affected municipalities is the most effective way to address the larger problem.

Staff Capabilities:

- The opportunity exists for jurisdictions with limited resources to utilize the regional planning agency to support mitigation planning efforts.

Emergency Services:

- The opportunity exists for the agencies to further educate the public on techniques and methods to mitigate natural hazards, such as preventing wildfires and flooding, as well as suitable locations in the event of a tornado or other severe weather event.

- Seeking grant funds to acquire needed equipment is paramount to maintain and expand the level of service to respond to hazards. Joint or pooled purchasing arrangements can result in savings through bulk purchase and negotiated rates. A regional entity could offer pooled purchasing to interested local agencies.

5.0 ACTION PLAN

The overall purpose of this plan is to identify strategies to mitigate the hazards identified to reduce threats to public safety and property. These strategies strive to mitigate the higher risk hazards of severe weather, disruption of municipal infrastructure, loss of property and lives from structural and wildfires, and public health emergencies,

5.1 Mitigation Actions

This section describes the action to be taken, the agency responsible, and available funding source if known. The main federal funding sources for hazard mitigation are:

HMGP: Hazard Mitigation Grant Program
PFG: HMGP Post Fire Grants
FMA: Flood Mitigation Assistance Program
BRIC: Building Resilient Infrastructure and Communities
PDM: Pre-Disaster Mitigation Program

Other funding sources noted in this chapter are:

EMPG: Emergency Management Performance Grants
HMG: PHMSA Hazardous Materials Grant Program
HMEP: PHMSA Hazardous Materials Emergency Preparedness Grant
HSGP: Homeland Security Grant Program
AFG: Assistance to Firefighters Grant Program
USDA-RD: USDA Rural Development Programs

A summary of available grant programs is included as Appendix H. Possible funding sources were listed under each action. The listed funding source is not an inclusive listing of available resources nor guarantees the project would be funded through that particular source. Funding of projects listed with "local resources" may be accomplished through local funds or through other grant funds obtained by an agency. Additional information on available hazard mitigation funding can be found in FEMA's Hazard Mitigation Assistance Unified Guidance document (2013) and FEMA's website.

The following "Hazard Related Actions" are listed in order of priority as explained in Table 4-2, 4-3, and 4-4 Strategies. At the end of this section, Table 5-1 summarizes the actions and agencies/personnel that would be responsible for undertaking the actions listed. The responsible local government agency to carry out an action is stated generally as Local Governments. Table 5-2 indicates the specific jurisdiction responsible in each location.

At the time of the Plan's pending approval, an additional strategy was added at the request of Delta County Administration, Emergency Management, and the LEPC. Delta County has recognized that past practices in addressing new properties were inconsistent with state

procedures for 911 geolocation and conflicting reporting between agencies. In an effort to rectify this, Delta County Central Dispatch and the County Administration would pursue funding to re-address properties in the rural townships en masse. This project is expected to encompass significant time and manpower. Please see Appendix I for more information on this additional action.

Budget concerns dictate that project implementation would depend largely on securing grant funding. Therefore, agencies and organizations would undertake the following strategies provided there is adequate funding and resources to accomplish the project. Completion of the projects should be directed towards those projects that have the highest priority. Estimated project completion dates are identified.

5.1.1 Hazard Related Actions from the Initial Plan

***Action*:** Develop/update site emergency plans for SARA Title III sites.
***Lead Agency*:** County Emergency Management
***Funding Source*:** Local Resources, EMPG, LEPC
Time Frame: Ongoing
Status: Several of the site plans are updated each year on a rotating schedule and maintained by the County Emergency Manager.

***Action*:** Regularly conduct exercises of site emergency plans and community response plans.
***Lead Agency*:** County Emergency Management
***Funding Source*:** Local Resources, EMPG
Time Frame: Ongoing
Status: Exercises conducted at least two times per year and coordinated by the County Emergency Manager.

***Action*:** Maintain adequate road and debris clearing capabilities.
***Lead Agency*:** County Road Commission
Supporting Agency: MDOT, Cities of Escanaba and Gladstone, and Village of Garden
***Funding Source*:** HMGP, MDOT
Time Frame: Ongoing
Status: County Road Commission and municipal departments of public works regularly clear streets after weather events.

***Action*:** Institute training, planning and preparedness for hazardous materials and general transportation incidents on roadways and railways.
***Lead Agency*:** County Emergency Management
***Funding Source*:** HMGP, Local Resources, EMPG, Fire
Time Frame: Ongoing
Status: Agencies regularly conduct training sessions and hazardous material components are incorporated into exercises.

Action**:** Ensure fire departments and other first responders have adequate training and equipment to respond to hazardous materials accidents.
Lead Agency**:** County Emergency Management
Funding Source**:** HMGP, EMPG
Time Frame: Ongoing
Status: Region 8 Homeland Security Planning Board is discussing the possibility of forming a regional hazardous materials response team.

Action**:** MDOT, road commissions and local governments should continually examine and identify problem roadways and intersections. Improve the design of such locations to alleviate the situation and/or install appropriate traffic controls.
Lead Agency**:** MDOT
Supporting Agency: Cities of Escanaba and Gladstone
Funding Source**:** MDOT, HMGP, EMPG
Time Frame: FY2015
Status: Road commissions do regularly examine, identify, and improve problem roadways and intersections. The City of Escanaba maintains a Traffic Safety Committee that identifies issues and suggests solutions.

Action**:** Maintain facility and community training and exercise programs.
Lead Agency**:** County Emergency Management
Funding Source**:** Local Resources, EMPG
Time Frame: Ongoing
Status: Facility training programs have been implemented. Unknown to what extent these programs have been maintained since previous plan update.

Action**:** Institute an emergency warning system with a distinct, unique sound to be associated with a specific accident or disaster.
Lead Agency**:** County Emergency Management
Funding Source**:** PDMP, HMGP, EMPG
Time Frame*:* FY2012
Status: No warning system has been developed. With widely-distributed pockets of population in a mostly rural area, the purchase of multiple warning systems has not been economically feasible.

Action**:** Ensure county road commission and local public works personnel have adequate training and equipment for spill control at HAZMAT accidents.
Lead Agency**:** Road Commission
Supporting Agency: Cities of Escanaba and Gladstone and village of Garden
Funding Source**:** HMGP
Time Frame: Ongoing
Status: Region 8 Homeland Security Planning Board is in discussing the possibility of forming a regional hazardous materials response team.

Action**:** Explore the establishment and implementation of a "reverse 911" calling system in Delta County.
Lead Agency**:** County Emergency Management
Funding Source**:** HMGP, EMPG
Time Frame: In planning stage
Status: System only in place near natural gas storage center in Rapid River.

Action**:** Continue use of NOAA Weather Radio weather tower coverage.
Lead Agency**:** County Emergency Management
Funding Source**:** PDMP, HMGP, EMPG
Time Frame: Ongoing
Status: Delta County has NOAA Weather Radio coverage.

Action**:** Increase use of NOAA Weather Radio through community awareness and education programs.
Lead Agency**:** County Emergency Management
Supporting Agency: LEPC
Funding Source**:** PDMP, HMGP, EMPG
Time Frame: O-going
Status: The NOAA Marquette office holds regular education events.

Action: Institute a public education program regarding emergency warning systems.
Lead Agency**:** County Emergency Management
Supporting Agency: LEPC
Funding Source**:** Local Resources, EMPG
Time Frame: Ongoing
Status: There are no emergency warning systems in place. With widely-distributed pockets of population in a mostly rural area, the purchase of multiple warning systems has not been economically feasible.

Action: Seek funding from public and private sources to maintain and improve/expand emergency warning systems in communities throughout the County.
Lead Agency: County Emergency Management
Supporting Agency: LEPC
Funding Source: Local resources, EMPG
Time Frame: Ongoing
Status: Planning was done, but no action taken.

Action: Ensure fire departments and other responders have adequate equipment and training to respond to structural and commercial fires.
Lead Agency: *Responsible Agency*: Fire Departments
Supporting Agency: County Emergency Management, Emergency Medical Services

***Funding Source*:** Local Resources, HMGP, and Assistance to Firefighters Grant Program
***Time Frame**:* Ongoing
Status: Fire departments and first responders must attend regular training sessions. These organizations also assess their equipment needs on a regular basis.

***Action*:** Continue mutual aid agreements among the various fire departments.
***Lead Agency*:** Fire Departments
Supporting Agency: County Emergency Management, Local Units of Government
***Funding Source*:** Local Resources
Time Frame: Ongoing
Status: Mutual aid agreement in place in Delta County.

***Action*:** Develop/update evacuation plans of facilities and of communities. Confirm that first responder, fire departments and law enforcement agencies are aware of such plans.
***Lead Agency*:** County Emergency Management
Supporting Agency: Fire Departments, Emergency Medical Services, LEPC
***Funding Source*:** Local Resources, EMPG
Time Frame: Ongoing
Status: The plans for some facilities have been prepared. Unknown to the extent that these have been maintained.

***Action*:** Construct connector roads to reduce congestion of arterial roads.
***Lead Agency*:** MDOT
Supporting Agency: Cities of Escanaba and Gladstone
***Funding Source*:** HMGP
Time Frame: FY2015
Status: Connector roads have been improved in Escanaba, particularly N 30th Street.

***Action*:** Utilize a geographic information system to map storm sewers, spillways and residential wells throughout the county.
***Lead Agency*:** Drain Commission, Public Health Department
Supporting Agency: Local Units of Government
Funding Source: PDMP, HMGP, EMPG
***Time Frame**:* FY2010
Status: Health department has mapped residential wells in the county. Cities maintain GIS mapping of municipal infrastructure.

***Action*:** Purchase and distribute NOAA radios.
Lead Agency: County Emergency Management
***Funding Source*:** HMGP
Time Frame: Ongoing
Status: Unknown if action has been undertaken.

Action**:** Maintain and improve/expand emergency warning systems in communities across the County.
Lead Agency**:** County Emergency Management
Funding Source**:** PDMP, EMPG
Time Frame: FY2012
Status: No warning systems are in place.

Action**:** Continue to implement a countywide fire-training program.
Lead Agency**:** Fire Departments
Supporting Agency*:* County Emergency Management
Funding Source**:** Local Resources, Assistance to Firefighters Grant Program
Time Frame: Ongoing
Status: Firefighters must attend regular training sessions.

Action**:** Update site emergency plans for schools, factories, office buildings, and other appropriate sites.
Lead Agency**:** County Emergency Management
Supporting Agency*:* Fire Departments
Funding Source**:** Local Resources
Time Frame*:* Ongoing
Status: Site emergency plans are continuously updated for schools and other sites.

Action: Install lightning protection devices on communities' communication and utility infrastructure.
Lead Agency: Local Units of Government
Funding Source: HMGP, EMPG
Time Frame: FY2012
Status: Devices have been installed where it has been feasible.

Action**:** Install signs along the highway to denote the actual speed of vehicles traveling on the roadway.
Lead Agency**:** MDOT
Supporting Agency: Local units of government
Funding Source: PDMP, HMGP
Time Frame*:* FY2012
Status: Local traffic control agency has a movable radar sign that is periodically installed at busy roadways.

Action**:** Continue with training of and provide for the increased use of weather spotters.
Lead Agency**:** NOAA
Supporting Agency: County Emergency Management
Funding Source**:** NOAA

***Time Frame**:* Ongoing
Status: There is weather spotter training held yearly in Delta County.

Action**:** Bury/ protect power and utility lines.
Lead Agency: Utility Companies
***Supporting Agency**:* County Emergency Management
Funding Source: HMGP
Time Frame: Ongoing
Status: Utility company tree trimmers ensure power line safety and reliability. Burying of power lines has only been done where it has been feasible to do so.

Action: Install or upgrade sprinkler systems in commercial or high-density residential use buildings, schools, churches, and other buildings where large masses of people congregate.
Lead Agency**:** Fire Departments
***Supporting Agency**:* County Emergency Management, Local Units of Government
Funding Source**:** Local Resources
Time Frame: FY 2015
Status: New and renovated buildings must comply with building codes that mandate sprinkler systems.

Action**:** Inventory exempt SARA Title III sites.
Lead Agency**:** LEPC
***Supporting Agency**:* County Emergency Management
Funding Source**:** Local Resources, EMPG
***Time Frame**: FY2010*
Status: Emergency manager maintains an informal inventory of known sites.

Action**:** Use snow fences or living snow fences to limit blowing and drifting snow over critical roadway segments.
Lead Agency**:** County Road Commission
Supporting Agency: County Emergency Management, MDOT, Local Units of Government
Funding Source**:** HMGP, Local Resources
Time Frame: *FY2010*
Status: Snow fences are utilized where conditions warrant.

Action**:** Update and/or expand public education efforts for emergency preparedness.
Lead Agency: County Emergency Management
***Supporting Agency**:* LEPC, Fire Departments, Law Enforcement, NOAA
Funding Source: Local Resources, EMPG
Time Frame: Ongoing
Status: Several programs conducted. Programs have not been maintained in several years.

Action: Correct shelter weaknesses by updating equipment, providing adequate generators, and establishing shelters for vulnerable populations.
Lead Agency: County Emergency Management
Supporting Agency*:* Red Cross
Funding Source**:** HMGP, EMPG
Time Frame*:* Ongoing
Status: Shelter attributes are continuously reviewed.

Action**:** Identify existing shelter locations, strengths, and weaknesses.
Lead Agency: Red Cross
Supporting Agency: County Emergency Management
Funding Source: Local Resources, EMPG
Time Frame: Ongoing
Status: Shelter attributes are continuously reviewed.

Action: Have a system in place to facilitate the immediate response to ice jams on rivers.
Lead Agency**:** MDEQ
Funding Source: Local Resources
Time Frame: *FY2015*
Status: MDEQ (EGLE) was consulted about developing a response system.

Actions from the 2015 Update

Action: Increase public awareness of the need for permits (EGLE Part 31) for building in flood plain areas.
Responsible Agency: County Board, Local Units of Government
Funding Source: Local Resources
Time Frame: Ongoing
Status: Recent high-water levels on Lake Michigan necessitated increasing public awareness.

Action: Enforce basic building code requirements related to flood mitigation.
Responsible Agency: County Board, Local Units of Government
Funding Source: HMG, (post-disaster only), Local Resources
Time Frame: Ongoing
Status: Local Building and Zoning officials enforce requirements.

Action: Encourage local governments to participate in the National Flood Insurance Program.
Responsible Agency: Local Units of Government
Funding Source: Local Resources
Time Frame*:* On-going
Status: The majority of local governments participate in the NFIP. Maple Ridge, Baldwin, and Bark River Townships are non-participating at this time.

***Action*:** Lake Michigan shoreline communities (Ford River, Wells, Brampton, Masonville, Ensign and Bay de Noc Townships, and cities of Escanaba and Gladstone) and Delta County should continue to be active partners with FEMA as the agency proceeds to complete the Risk MAP (Mapping, Assessment and Planning) study.
Responsible Agency: Local Units of Government
Funding Source: Local Resources
Time Frame: Ongoing
Status: Communities have participated with FEMA and updated mapping for Delta County is being finalized.

Action: Utilize flood risks products developed by FEMA to become more informed of mitigation actions to reduce identified flood risks.
Responsible Agency: County Emergency Management
Funding Source: Local Resources
Time Frame: Ongoing
Status: Communities reference flood products and updated maps are being finalized.

Action: Develop a system of alternative routes to detour traffic away from hazardous material spills while maintaining a reasonable traffic flow.
Responsible Agency*:* County Road Commission, MDOT
Funding Source: Local Resources, HMG, PDM
Time Frame*:* Ongoing
Status: Public Safety and Road Commissions analyze alternative routes regularly.

Action: Ensure that fire departments have adequate equipment and training to respond to wildland fires.
Responsible Agency: County Emergency Management, Fire Departments
Funding Source: Local Resources
Time Frame: Ongoing
Status: Regular training exercises occur with collaboration between departments.

Action: Implement and continue to provide countywide training and equipment to respond to a public health emergency.
Responsible Agency: Public Health Department
Funding Source: Local Resources
Time Frame: Ongoing
Status: Some training was in place before the COVID-19 pandemic; lessons learned will be implemented in new plans and training.

Action: Provide back-up generators for water and wastewater treatment facilities, the county airport, and the county jail to maintain acceptable operating levels during power failures.
Responsible Agency: County Emergency Management
Funding Source: HMG, PDM

***Time Frame**:* Ongoing
Status: Several critical facilities have back-up generators.

Action: Use check valves, sump pumps, and backflow preventers in homes and buildings.
Responsible Agency: County Emergency Management, Public Health Department
Funding Source: HMG, PDM, FMA
Time Frame: Ongoing
Status: Unknown to what extent this has been implemented in private structures.

Action: Develop a database and keep current a listing of volunteers that can assist during a major public health event.
Responsible Agency: Public Health Department
Funding Source: Local Resources
Time Frame: Ongoing
Status: Volunteers and partner agencies were utilized during the COVID-19 pandemic.

Action: Develop and continue to update existing plans to cover possible public health emergency events.
Responsible Agency: Public Health Department
Funding Source: Local Resources
Time Frame: On-going
Status: Some training was in place before the COVID-19 pandemic; lessons learned will be implemented in new plans and training.

Action: Identify escape and entry routes in areas with high wildfire risk.
Responsible Agency: US Forest Service, Michigan DNR, County Sheriff Department, Fire Departments.
Funding Source: Local Resources
Time Frame: Ongoing
Status: Forest Service and DNR regularly identify areas of high risk.

Action: Identify natural fire breaks where wildland fires might be intercepted and contained.
Responsible Agency: US Forest Service, Michigan DNR, County Sheriff Department, all fire departments.
Funding Source: Local Resources
Time Frame: Ongoing
Status: Forest Service and DNR regularly maintain fire breaks.

Action: Increase public awareness of the causes, symptoms, and protective actions for disease outbreaks and other potential public health emergencies.
Responsible Agency: Public Health Department
Funding Source: Local Resources
Time Frame: Ongoing

Status: The Health Department has regularly provided information and guidance during the COVID-19 pandemic.

Action: Provide local training to officials on flood mitigation measures, flood plain management, flood proofing, etc.
Responsible Agency: County Emergency Management
Funding Source: Local Resources
Time Frame*:* Ongoing
Status: FEMA held an open house for flood mitigation information in 2021.

Action: Construct elevated or alternative roads that are unaffected by flooding, or making roads more flood-resistant through better drainage and/or stabilization/armoring of vulnerable shoulders and embankments.
Responsible Agency: County Road Commission, MDOT
Funding Source: HMG, PDM, FMA
Time Frame: Ongoing
Status: Ongoing where funding is available.

Action: Provide emergency generators for use at all school facilities and the county airport.
Responsible Agency: County Emergency Management
Funding Source: HMG, PDM
Time Frame: Ongoing
Status: Some facilities have emergency generators.

Action: Institute public education of flood warning systems.
Responsible Agency: County Emergency Management
Funding Source: Local Resources
Time Frame: Ongoing
Status: There are no flood warning systems in place. Local education on NWS flooding severity terms could be expanded.

Action: Provide portable pumps for use at municipal fuel pumping facilities and designated gas stations through the county.
Responsible Agency: County Emergency Management
Funding Source: Local Resources, PDM
Time Frame: Ongoing
Status: Ongoing. Unknown to what extent private gas stations have portable pumps for emergencies.

Action*:* Acquire drainage easements in order to allow for the planned and regulated public use of privately owned land for temporary water retention and drainage.
Responsible Agency: Local Units of Government
Funding Source: HMG, PDM, FMA

Time Frame: Ongoing
Status: Ongoing. Uknown to the extent that local units of government that have easements or agreements in place.

Action: Ensure that fire departments have adequate equipment and training to respond to flood conditions.
Responsible Agency: Fire Departments
Funding Source: Local Resources
Time Frame*:* Ongoing
Status: Regular training and exercises are conducted. Additional funding is sought to upgrade equipment as needed.

Action: Institute a public education program regarding emergency flood warning systems.
Responsible Agency: County Emergency Management
Funding Source: Local Resources
Time Frame: Ongoing
Status: There are no flood warning systems in place.

Action: Improve/update accurate flood plain mapping of communities.
Responsible Agency: Local Units of Government
Funding Source: Local Resources
Time Frame: On-going
Status: FEMA is finalizing new flood plain maps for Delta County.

Actions for the 2022 Plan Update

1) ***Action:*** Support recruitment, equipment procurement, and training of volunteer firefighters to ensure that departments have adequate personnel to respond to incidents.
Responsible Agency: Local Fire Departments
Supporting Agencies: County Emergency Management, Local Governments
Funding Source: Local Resources, HMGP, EMPG, AFG
Time Frame: Ongoing

2) Action: Develop a communications strategy to promote the need for cybersecurity training for local businesses and critical agencies and infrastructure.
Responsible Agency: County Emergency Management, Local Governments
Funding Source: Local Resources, BRIC
Time Frame: FY2024

3) Action: Collaborate with utility providers to communicate and coordinate outage response plans, identify vulnerabilities, and help mitigate issues.
Responsible Agency: County Emergency Management, LEPC
Funding Source: Local Resources, EMPG, BRIC
Time Frame: Ongoing

4) Action: Train first responders to anticipate failures of interdependent systems and develop response plans accordingly.
Responsible Agency: County Emergency Management
Supporting Agencies: 911 Dispatch, Law Enforcement, Fire Departments, Emergency Medical Services
Funding Source: Local Resources, HMGP
Time Frame: FY2024

5) Action: Purchase mobile signage to warn drivers of hazardous roadway conditions when present.
Responsible Agency: County Road Commission, MDOT
Supporting Agencies: Local Governments, Law Enforcement
Funding Source: Local Resources
Time Frame: FY2024

6) Action: Purchase storage space to create a local inventory of personal protective equipment (PPE) and other response materials for immediate use when emergencies occur.
Responsible Agency: County Emergency Management
Supporting Agencies: Public Health Department, Emergency Medical Services
Funding Source: Local Resources
Time Frame: Ongoing

7) Action: Coordinate with county road commission, MDOT, and utility providers to create an aggressive tree and brush removal strategy along trunkline roads to prevent blockages from debris
Responsible Agency: County Road Commission, MDOT
Supporting Agencies: Local Governments, Utility Providers
Funding Source: Local Resources
Time Frame: Ongoing

8) Action: Develop a communication strategy that analyzes what information, best practices, and possible improvements can be taken from response to the COVID-19 Pandemic and implement these into revised plans and practices.
Responsible Agency: County Emergency Management, LEPC
Supporting Agencies: Local Governments, Public Health Department, First Responders
Funding Source: Local Resources
Time Frame: Ongoing

9) Action: Explore the possibility of instituting and the practical use of a countywide emergency notification system through smartphone applications.
Responsible Agency: County Board, County Emergency Management, LEPC
***Supporting Agencies*:** 911 Dispatch, Law Enforcement

Funding Source: Local Resources
Time Frame: FY2023

10) Action: Invite Department of Homeland Security, other emergency agency personnel, to participate in local exercises with hazardous material release components.
Responsible Agency: County Emergency Management, LEPC
Funding Source: Local Resources
Time Frame: Ongoing

11) Action: Ensure that local first responders and Delta County Search and Rescue have appropriate equipment to respond to emergencies that occur during inclement weather.
Responsible Agency: First Responders
***Supporting Agencies*:** County Emergency Management, LEPC
Funding Source: Local Resources, HMGP, AFG
Time Frame: Ongoing

12) Action: Identify possible roadway pinch points and alternative traffic routes along rural areas of US-2.
Responsible Agency: County Emergency Management
Supporting Agencies: County Road Commission, MDOT, MSP, Law Enforcement
Funding Source: Local Resources, MDOT, MSP
Time Frame: Ongoing

13) Action: Build an incident response and recovery plan for cybersecurity attacks to local systems or reaction to cybersecurity attacks to critical facilities.
Responsible Agency: Local Governments
Supporting Agencies: County Emergency Management
Funding Source: Local Resources
Time Frame: Ongoing

14) Action: Add cybersecurity elements to local exercises and emergency action plans.
Responsible Agency: County Emergency Management
Funding Source: Local Resources
Time Frame: Ongoing

15) Action: Coordinate the lease of large construction equipment from local companies during their off-season to provide additional capacity for snow removal
Responsible Agency: County Government
Supporting Agencies: County Road Commission, Public Works Departments
Funding Source: Local Resources
Time Frame: Ongoing

16) Action: Purchase an emergency standby generator and secure emergency shelter status for Ford River Township Hall
Responsible Agency: Ford River Township
Supporting Agencies: County Emergency Management, County Board, Red Cross
Funding Source: Local Resources, HMGP, PDM
Time Frame: Ongoing

17) Action: Revised County addressing system and fire signs to streamline public safety response, reporting, and administrative processes. (See Appendix I)
Responsible Agency: Delta County Central Dispatch
Supporting Agencies: County Emergency Management, County Board, Townships
Funding Source: BRIC, HMGP, Local Resources
Time Frame: Ongoing

5.1.2 Administrative Actions Related to Hazard Mitigation

Action: **Adopt the Delta County Hazard Mitigation Plan.**
***Responsible Agency*:** Delta County Board of Commissioners
***Supporting Agency**:* Townships, Village and Cities within Delta County
Funding Source: Local Resources
Status: The original Plan was adopted by the county and local units. The County has adopted the 2014 Update. Other municipalities in the county will have the opportunity to adopt the Plan.

Action: **Utilize Hazard Mitigation in local planning and zoning documents.**
***Responsible Agency**:* Delta County Board of Commissioners
***Supporting Agency*:** Townships of Bark River, Ford River, Escanaba, Garden, and Masonville and cities of Escanaba and Gladstone, the village of Garden, and the Delta County Building and Zoning Department, and CUPPAD Regional Commission.
Funding Source: Local Resources
***Time Frame**:* On-going
Status: Information contained in the Plan has been utilized in planning documents.

Action: **Continue to participate in the NFIP program and work with non-participating jurisdictions to help them join.**
Participating Jurisdictions: Bay de Noc, Brampton, Cornell, Ensign, Escanaba, Fairbanks, Ford River, Garden, Masonville, Nahma, and Wells Townships; City of Escanaba and Gladstone; Village of Garden
Non-participating Jurisdictions: Maple Ridge, Baldwin, and Bark River Townships.

Table 5-1
Summary of Actions and Responsible Parties

	Support recruitment, equipment, training, for VFDs	Communication strategy for cybersecurity education	Coordinate utility outage response	Train first responders to be aware of infrastructure issues	Mobile Signage	PPE storage	Tree/brush removal along trunklines	Revised communication strategy	Countywide emergency notification system	Hazardous materials exercises	Delta County SAR equipment	Identify route alternatives along rural US-2	Cybersecurity response plans	Cybersecurity exercises	Lease large equipment for winter weather mitigation	Emergency generator and shelter status for Ford River Township Hall	Revise County Addressing for Public Safety	Adopt Plan and consider hazard mitigation in local planning/zoning	Continued participation in the NFIP
County Board	X	X				X	X	X	X				X		X	X	X	X	
County Emergency Management	X	X	X	X		X		X	X	X	X	X	X	X		X	X		
Local Emergency Planning			X	X				X	X	X	X								
Law Enforcement			X	X				X	X		X	X							
Fire Services	X		X	X				X			X								
Emergency Medical Services			X	X		X		X			X								
Public Health						X		X											
County Road Commission			X		X		X					X			X				
MDOT					X		X					X							
Central Dispatch																	X		
Township/City/Village																			
Baldwin Twp.	X	X					X	X									X	X	
Bark River Twp.	X	X					X	X									X	X	
Bay de Noc Twp.	X	X					X	X									X	X	X
Brampton Twp.	X	X					X	X									X	X	X
Cornell Twp.	X	X					X	X									X	X	X
Ensign Twp.	X	X					X	X									X	X	X
Escanaba City	X	X					X	X										X	X

Table 5-1
Summary of Actions and Responsible Parties

	Support recruitment, equipment, training, for VFDs	Communication strategy for cybersecurity education	Coordinate utility outage response	Train first responders to be aware of infrastructure issues	Mobile Signage	PPE storage	Tree/brush removal along trunklines	Revised communication strategy	Countywide emergency notification system	Hazardous materials exercises	Delta County SAR equipment	Identify route alternatives along rural US-2	Cybersecurity response plans	Cybersecurity exercises	Lease large equipment for winter weather mitigation	Emergency generator and shelter status for Ford River Township Hall	Revise County Addressing for Public Safety	Adopt Plan and consider hazard mitigation in local planning/zoning	Continued participation in the NFIP
Escanaba Twp.	X	X					X	X									X	X	X
Fairbanks Twp.	X	X					X	X									X	X	X
Ford River Twp.	X	X					X	X								X	X	X	X
Garden Twp.	X	X					X	X									X	X	X
Garden Village	X	X					X	X										X	X
Gladstone city	X	X					X	X										X	X
Maple Ridge Twp.	X	X					X	X									X	X	
Masonville Twp.	X	X					X	X									X	X	X
Nahma Twp.	X	X					X	X									X	X	X
Wells Twp.	X	X					X	X									X	X	X

5.2 Plan Maintenance

Maintenance of the plan consists of the responsible agencies performing the following:

- Reviewing and evaluating the original plan for changes due to new circumstances, information, or projects.
- Updating the plan on an annual or 5-year basis.
- Continued public participation in the hazard mitigation plan.

5.2.1 Reviewing, Evaluating, Monitoring, and Updating the Plan

The Delta County Emergency Management Coordinator is responsible for reviewing and updating the plan. A review of the plan is recommended annually. If Delta County is unable to examine the plan annually, the plan is required to be reviewed every five years and updated if necessary. The 5-year mandatory review and update of the hazard mitigation plan is needed due to ever changing circumstances in communities. The original hazard mitigation plan was reviewed and updated in 2014 and 2022. The next mandatory update of this hazard mitigation plan will be scheduled in five years from the date of FEMA plan approval for this update.

Reviewing and evaluating the hazard mitigation plan is crucial since changes in the type, extent, and total numbers of hazards are likely to occur over time. For instance, the risks and hazards identified in the plans may increase or decrease, new hazards may be brought forward due to new development patterns, or strategies may be implemented and new ones proposed.

The County Emergency Management Coordinator is responsible for meeting with the Local Emergency Planning Committee (LEPC) each year to evaluate the plan's performance during the past calendar year. The LEPC may, if it chooses, monitor the community's land use planning to ensure that mitigation goals and objectives are being considered in the day-to-day land use decisions. The LEPC meetings are posted and open to the public. Local units of government are invited to attend meetings that are scheduled to review and evaluate the plan.

Measures used to evaluate and update the plan are: changes in the number, type and/or extent of risk in the county or local jurisdiction; number of mitigation strategies accomplished; implementation problems; and recommendations on new projects or revision of current action items. The plan evaluation results will be summarized into a report. The need for plan amendments or updates is determined at this time.

Based on recommendations from the LEPC, the County Board of Commissioners approves recommendations for any appropriate changes. Local governments that have adopted the County Hazard Mitigation Plan are requested to adopt the new amendments or a new updated plan. Communities that have local land use control, i.e. locally adopted zoning ordinance are requested to consider and adopt the amendments or a new updated plan.

It is recommended that the mitigating actions described in the County Hazard Mitigation Plan be incorporated into planning documents prepared and adopted by either the Delta County

Board of Commissioners or local units of government within the county. Information contained in the mitigation plan would be useful to communities as they prepare or develop various planning documents. One suggested planning document is the master plan; the procedures for amending or adopting a plan are outlined in the in the Michigan Planning Enabling Act. The planning act requires communities with an adopted plan to review the plan every five years to determine if any necessary changes should be made to the plan. At the five-year review stage, the community should consult the Hazard Mitigation Plan to determine what findings and actions included in the Plan are appropriate for inclusion into the local plan. It is recommended that the community not wait for the five-year interval, but undertake an amendment to the plan with actions or other findings from the plan. Local officials will consider incorporating the mitigating actions as goals and objectives into their comprehensive plans.

No master plan in Delta County currently cites the County's Hazard Mitigation Plan directly. The master plans of the Village of Garden, Masonville Township, Escanaba Township, and Ford River Township identify certain natural and manmade hazards.

Another program specific plan that may be prepared is a "Community Development Plan," a required plan when a community applies for a federal Community Development Block Grant. The Community Development Plan includes an assessment of problems and needs of the community, a brief community profile and possible short term and long-term activities to address identified needs and problems of the area. The Hazard Mitigation Plan can be utilized in presenting the community profile, identification of community needs and problems, along with activities to address the identified hazard needs and problems.

5.2.2 Public Participation

The County Emergency Management Coordinator or other appointed agency achieves on-going public participation. The Emergency Management Coordinator or a designee attends meetings at least annually to update local officials and residents on hazard mitigation and inquire on potential projects. The Emergency Management Coordinator meets with organizations such as the Local Emergency Planning Committee, Township Association, local planning and zoning boards, Fire Chiefs, and the County Board of Commissioners. Ongoing public review of the Delta County Hazard Mitigation Plan will be achieved through the following; similar to the public engagement outlined in Chapter 1:

- LEPC meetings will continue to be advertised and open to the public. The public is encouraged to attend these meetings to learn about hazard mitigation efforts.

- A letter will be sent notifying Delta County local governments, neighboring counties, and members of the LEPC that the County Board has adopted the plan and encouraging local review and adoption.

- A copy of the plan will be available for public review at the Escanaba Public Library and the Delta County Courthouse.

- A notice will be placed in the local newspaper informing the public on where they can review the plan relevant to plan updates.

- The County Emergency Management Coordinator may arrange to have hazard mitigation information displayed on websites serving Alger County, the CUPPAD Regional Commission website, and on social media. Local officials and residents alike could easily access this type of media.

APPENDIX A

GENERAL INFORMATION AND STATISTICS FOR:

Delta County

Baldwin Township

Bark River Township

Bay de Noc Township

Brampton Township

Cornell Township

Ensign Township

City of Escanaba

Escanaba Township

Fairbanks Township

Ford River Township

Garden Township

Village of Garden

City of Gladstone

Maple Ridge Township

Masonville Township

Nahma Township

Wells Township

Delta County

Office Location	Courthouse 310 Ludington Street Escanaba, MI 49829
Phone	906.789.5100
Total Area	1,991.58 square miles (1,170.03 land) 1,274,291.2 acres (748,819.2 land)
2020 Population	36,026
Housing Units	19, 786(3,496 for seasonal, recreational or occasional use)
Total Households	16,234
Average Household Size	2.18 persons
2020 State Equalized Valuation (residential)	$1,079,777,368

Source: U.S. Census Bureau and Michigan Department of Treasury, 2020

County History

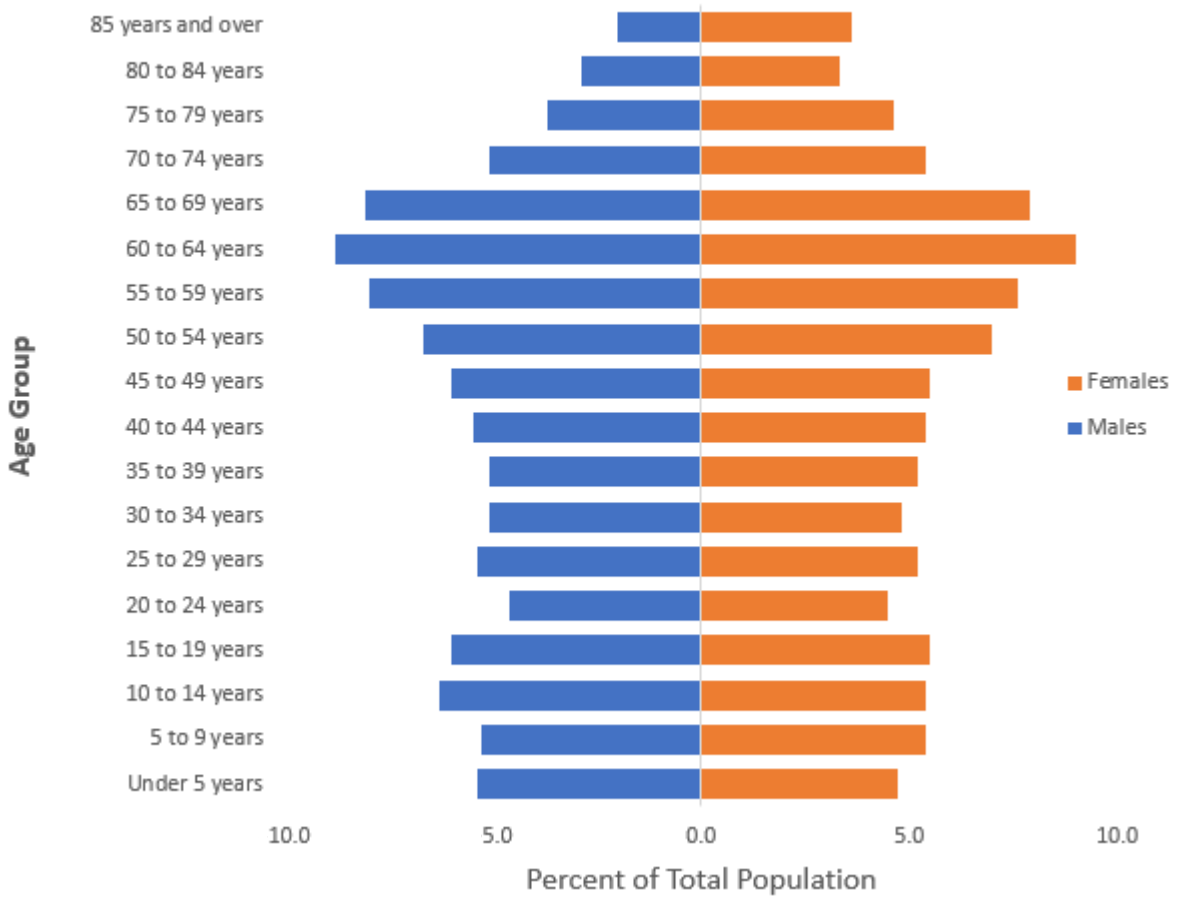
French missionaries arrived in the area in the mid-1600s marking perhaps the earliest exchange between indigenous inhabitants (Noquet Indians) and Europeans. The first settler of European descent was a fur trader on the Escanaba River. Lumbering activity attracted many others to the area as sawmills were built and settlements grew.

Delta County split from Mackinac County in 1843 and formally organized in 1861. It originally included all of what is now Menominee County and parts of present-day Dickinson, Iron and Marquette counties. Because of the triangular shape of the county, it was given the name Delta after the Greek letter.

Masonville (originally known as Gena) was the first organized "village" in the county and the first county seat. The county seat was moved to Escanaba in 1864. Escanaba was incorporated as a village in 1866 and became a city in 1883. Gladstone was settled in 1877, incorporated as a village in 1887, and became a city in 1889.

Lumbering fueled the local economy as multiple sawmills were built near river mouths and navigable natural harbors. As timber resources dwindled, the economy diversified. Agricultural settlements were encouraged by an abundance of inexpensive land. Manufacturing and shipping industries were established which furthered the diversification. Through it all though, the forest products industry has remained vital to the county economy.

Delta County Population by Age and Sex (2019 est.)



2019 Median Age: 47.4
2010 Median Age: 45.6
2000 Median Age: 40.4

Source: U.S. Census Bureau, 2019 and 2020. Compiled by CUPPAD Regional Commission, 2021.

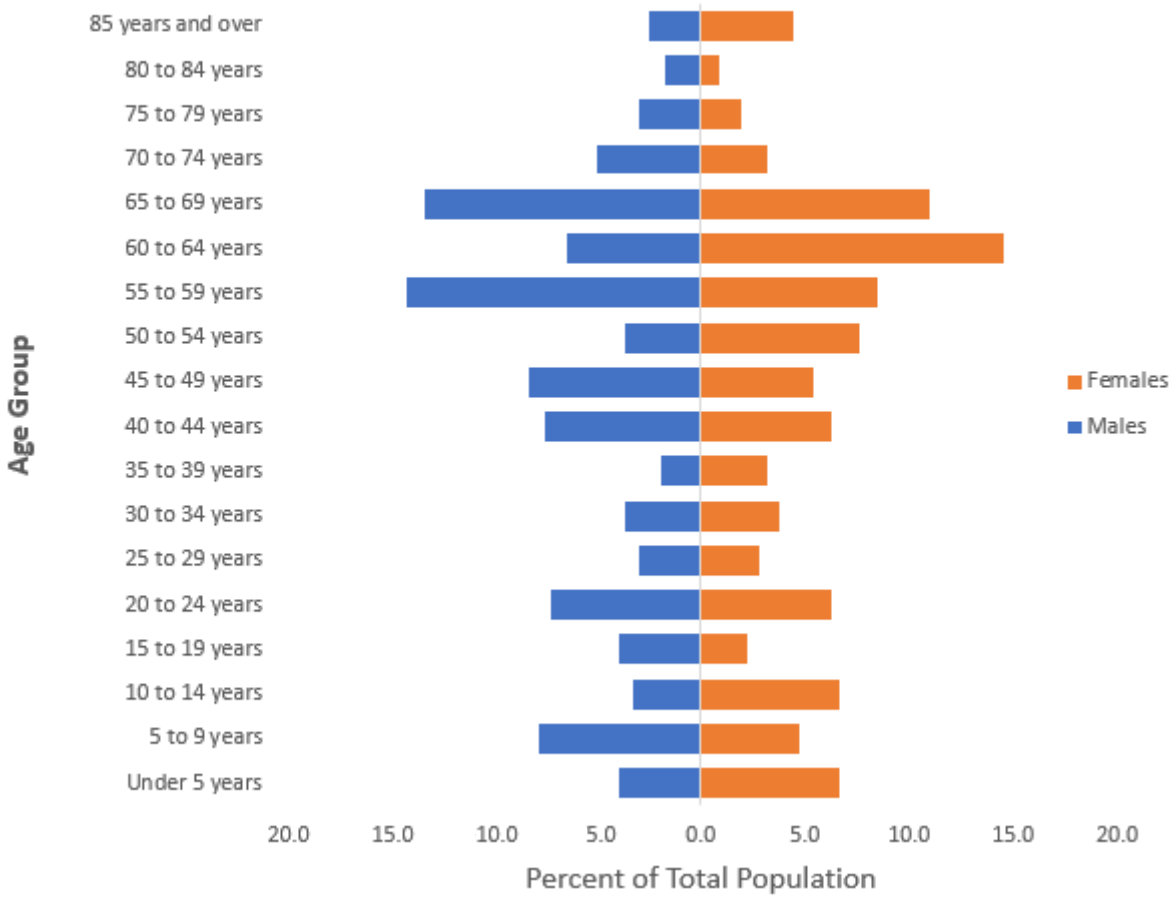
Baldwin Township: T41N & 42N - R22W, 23W & 24W

Office Location	Township Hall 5901 Perkins 30.5 Road Perkins, MI 49878
Mailing Address	P.O. Box 173 Perkins, MI 49872
Phone	906.359.4228
Total Area	84.2 square miles (83.77 land) 53,888.0 acres (53,612.8 land)
Population (2019*)	678
Housing Units (2010)	520 (166 for seasonal, recreational or occasional use)
Total Households (2010)	324
Average Household Size (2010)	2.34 persons
Primary Fire Department	Baldwin Township Volunteer Fire Dept.
Primary Police Department	Delta County Sheriff
School District(s)	Mid Peninsula School District
2020 State Equalized Valuation	$36,015,000

Source: U.S. Census Bureau and Michigan Department of Treasury, 2021. *2019 estimates

Baldwin Township is just over 13 miles at its widest point. The Escanaba River forms its southwestern boundary. Approximately 7,500 acres within the township are in state ownership. Predominate land cover is forest (80 percent) and agriculture (10 percent). Township offices and fire hall, along with several commercial and a furniture/cabinet manufacturer, are found in the community of Perkins. A small number of homes are found in Perkins, but mostly residences are scattered. About a quarter of the housing units are for seasonal or recreational use. State trunkline M-35 and CR428 are the most significant roadways in the township. Large diameter petroleum transmission pipelines, the Canadian National Railroad, and electric power transmission lines all pass through the township.

Baldwin Township Population by Age and Sex (2019 est.)



2019 Median Age: 51.6
2010 Median Age: 48.6
2000 Median Age: 41.3

Source: U.S. Census Bureau, 2019 and 2020. Compiled by CUPPAD Regional Commission, 2021.

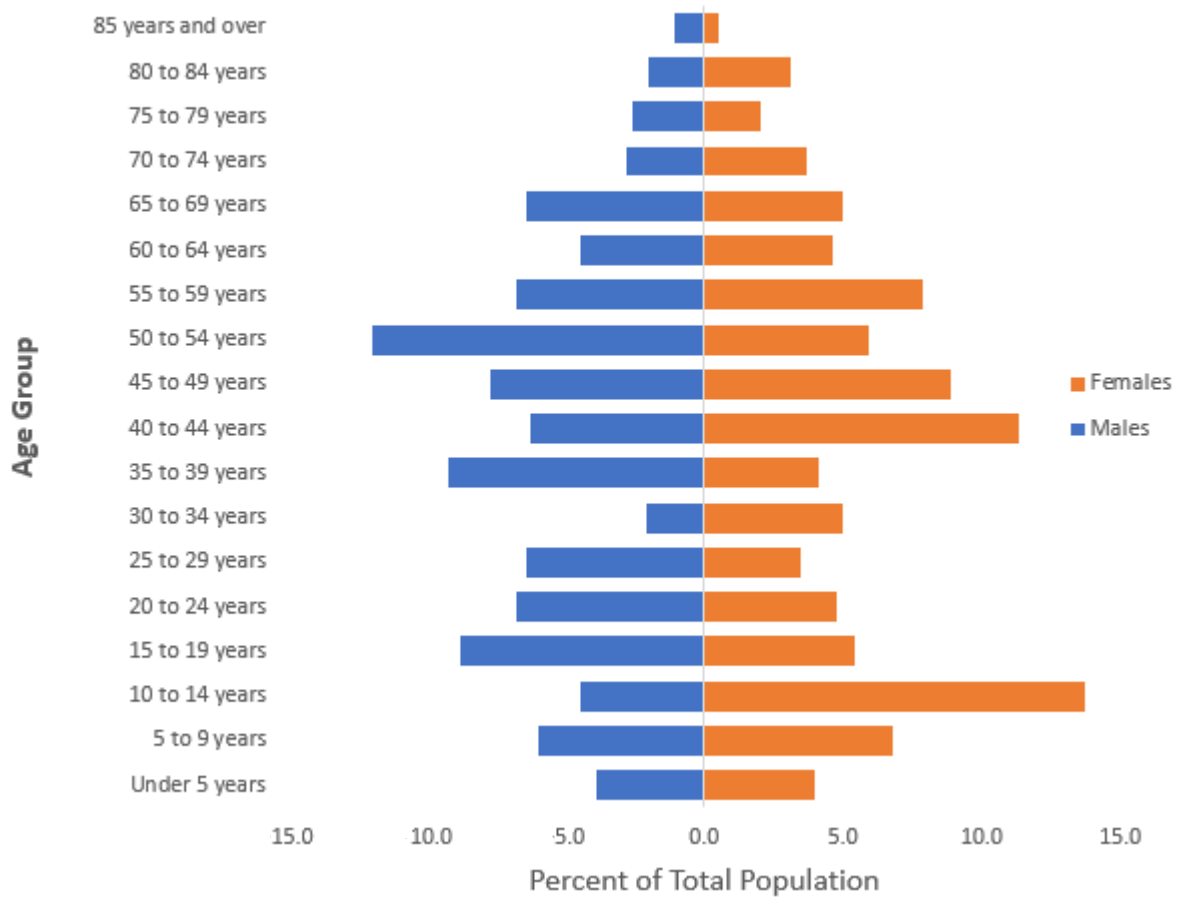
Bark River Township: T37N, 38N & 39N - R23W & 24W

Office location	Bark River Senior Center 4283 D Road Bark River, MI 49807
Mailing address	same as above
Phone	906.466.2331
Total Area	45.64 square miles (45.59 land) 29,209.6 acres (29,177.6 land)
Population (2019*)	1,649
Housing Units (2019*)	751 (87 for seasonal, recreational or occasional use)
Total Households (2019*)	654
Average Household Size (2019*)	2.51 persons
Primary Fire Department	Bark River Volunteer Fire Dept.
Primary Police Department	Delta County Sheriff
School District(s)	Bark River-Harris Schools
2020 State Equalized Valuation (residential)	$42,767,000

Source: U.S. Census Bureau and Michigan Department of Treasury, 2021. *2019 estimates

Bark River Township extends for 13 miles north-south and 4 miles at its widest point. About half the township area is forest covered, about a third is agricultural. All except approximately 2,000 acres is privately-owned, most of it in parcels of at least 40 acres. Highways US-2/41 and M-69 are the major transportation routes and the Canadian National Railroad runs through the township's center. The community of Bark River is the commercial and residential center of the township. A large feed mill and concrete products manufacturer are within the community. A modern township complex includes a fire hall and senior citizen/community center. A community wastewater system collects wastewater at a common point and pumps it to the Hannahville Indian Community Wastewater Treatment Plant.

Bark River Township Population by Age and Sex (2019 est.)



2019 Median Age: 40.8
2010 Median Age: 41.4
2000 Median Age: 36.3

Source: U.S. Census Bureau, 2019 and 2020. Compiled by CUPPAD Regional Commission, 2021.

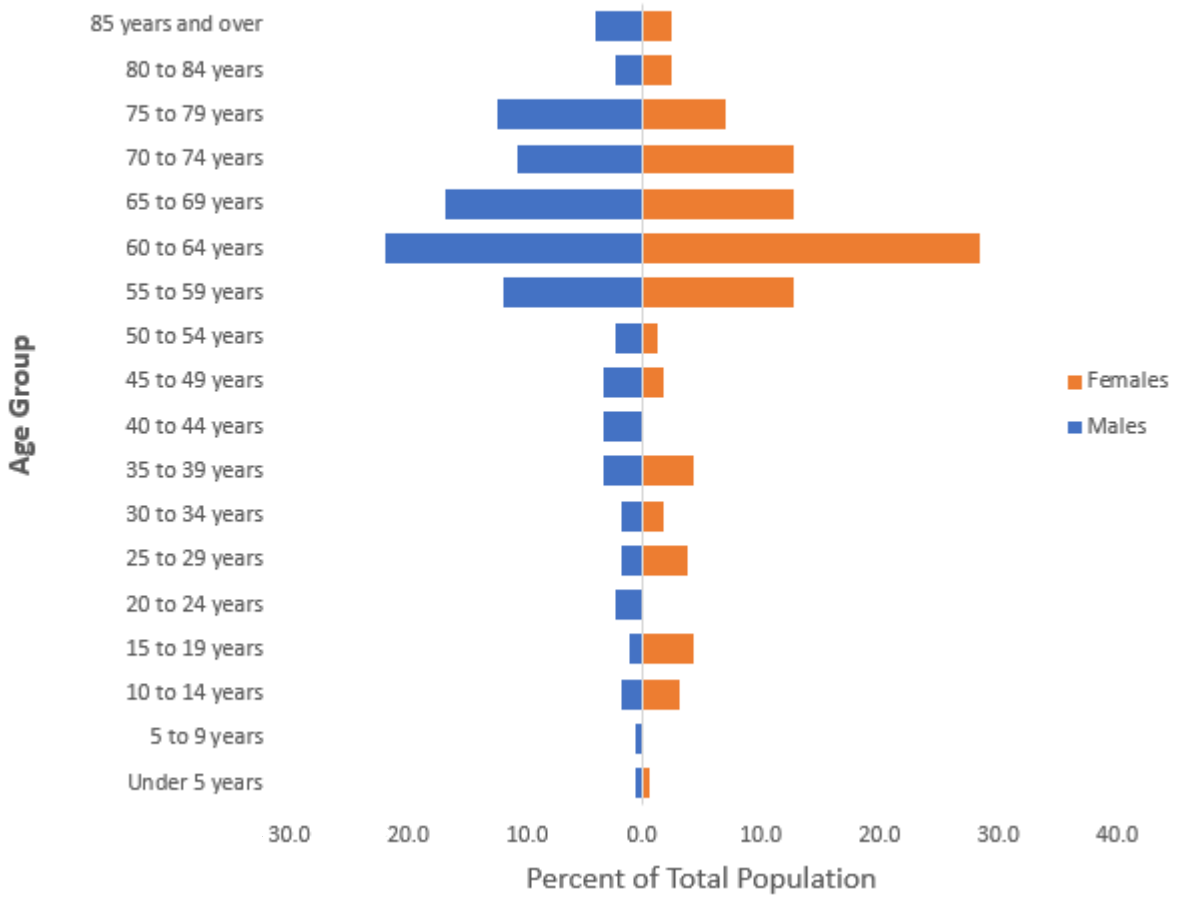
Bay de Noc Township: T39N, 39N & 40N - R20W, 21W & 22W

Office location	Township Hall 5870 County Road 513T Rapid River, MI 49878
Mailing address	(send to supervisor or clerk)
Phone	906.474.6286
Total Area	91.06 square miles (67.48 land) 58,278.4 acres (43,187.2 land)
Population (2019*)	339
Housing Units (2019*)	456 (309 for seasonal, recreational or occasional use)
Total Households (2019*)	189
Average Household Size (2019*)	1.79 persons
Primary Fire Department	Masonville Township Volunteer Fire Dept. (contracted)
Primary Police Department	Delta County Sheriff
School District(s)	Rapid River Public Schools
2020 State Equalized Valuation (residential)	$37,327,300

Source: U.S. Census Bureau and Michigan Department of Treasury, 2021. *2019 estimates

Bay de Noc Township encompasses the end of the Stonington Peninsula. It is over 80 percent forested with about 30 percent of the land area within the Hiawatha National Forest. Round and St. Vitals islands are within township boundaries. CR 513 is the busiest transportation route with county roads 511 and 503 being the most significant of the other roadways. Housing is scattered and two-thirds of the housing units do not serve as primary residences. Commercial development is limited to a small grocery and a few arts and crafts-type establishments. The township has no fire department. Fire protection services are provided through a contract with Masonville Township.

Bay de Noc Township Population by Age and Sex (2019 est.)



2019 Median Age: 63.0
2010 Median Age: 58.7
2000 Median Age: 51.1

Source: U.S. Census Bureau, 2019 and 2020. Compiled by CUPPAD Regional Commission, 2021.

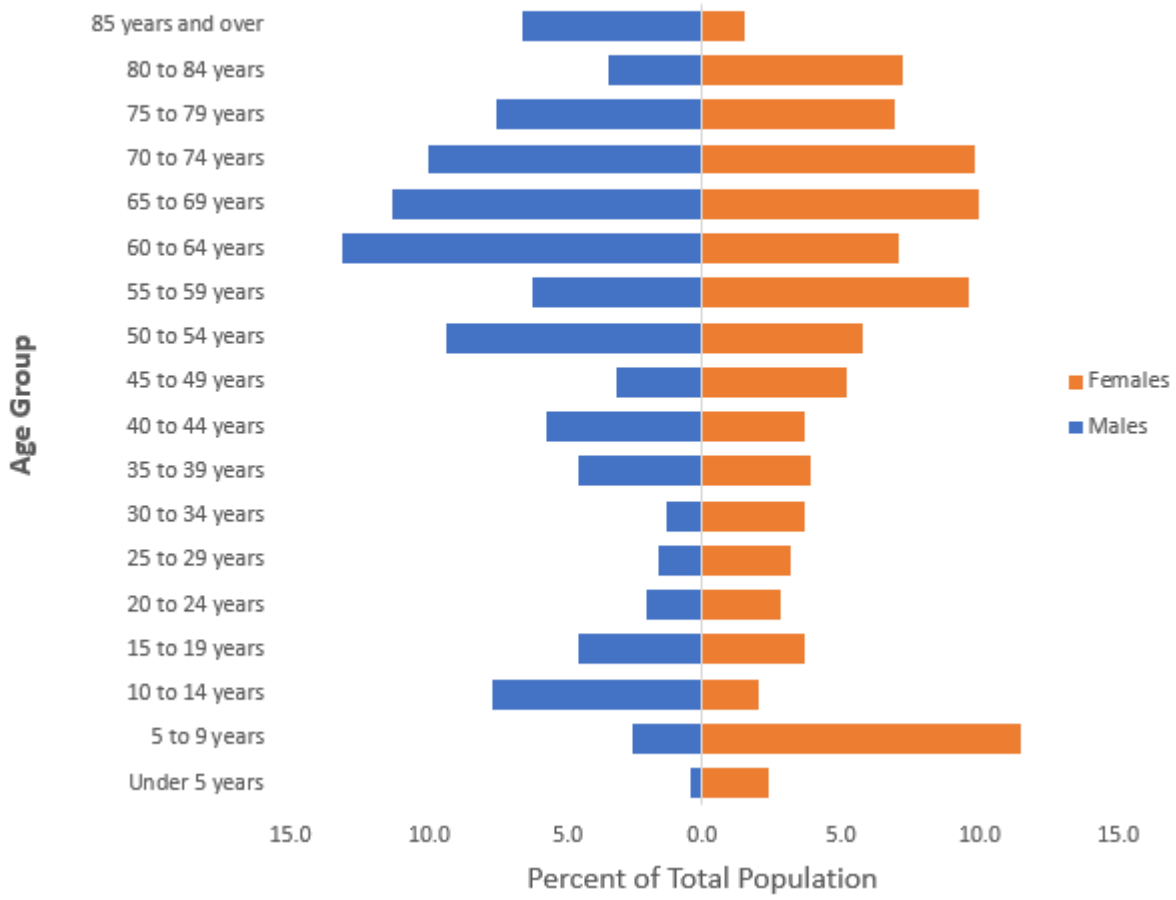
Brampton Township: T40N & 41N - R22W

Office location	Township Hall 9019 Bay Shore Drive Gladstone, MI 49837
Mailing address	(send to supervisor or clerk)
Phone	906.428.4790
Total Area	25.59 square miles (23.72 land) 16,377.6 acres (15,180.8 land)
Population (2019*)	984
Housing Units (2019*)	552 (101 for seasonal, recreational or occasional use)
Total Households (2019*)	441
Average Household Size (2019*)	2.22 persons
Primary Fire Department	Brampton Township Volunteer Fire Dept.
Primary Police Department	Delta County Sheriff
School District(s)	Gladstone Area Schools
2020 State Equalized Valuation (residential)	$37,893,200

Source: U.S. Census Bureau and Michigan Department of Treasury, 2021. *2019 estimates

Brampton Township borders Gladstone on the south and Little Bay de Noc on the southeast. About 80 percent of the township is forest covered. State ownership totals about 4,000 acres and more than 10 percent of the land area is wetland. Much of the township's development is found along Bayshore Drive (old US-2). Most of the waterfront area has been developed with some tourist business, but mostly residential. The community of Kipling lies just to the north of Gladstone and has a few commercial establishments including the township hall. Significant residential development has occurred in recent years in interior sections of the township. Trunklines US-2 and M-35 pass through the township as does the Canadian National Railroad.

Brampton Township Population by Age and Sex (2019 est.)



2019 Median Age: 58.5
2010 Median Age: 50.5
2000 Median Age: 42.4

Source: U.S. Census Bureau, 2019 and 2020. Compiled by CUPPAD Regional Commission, 2021.

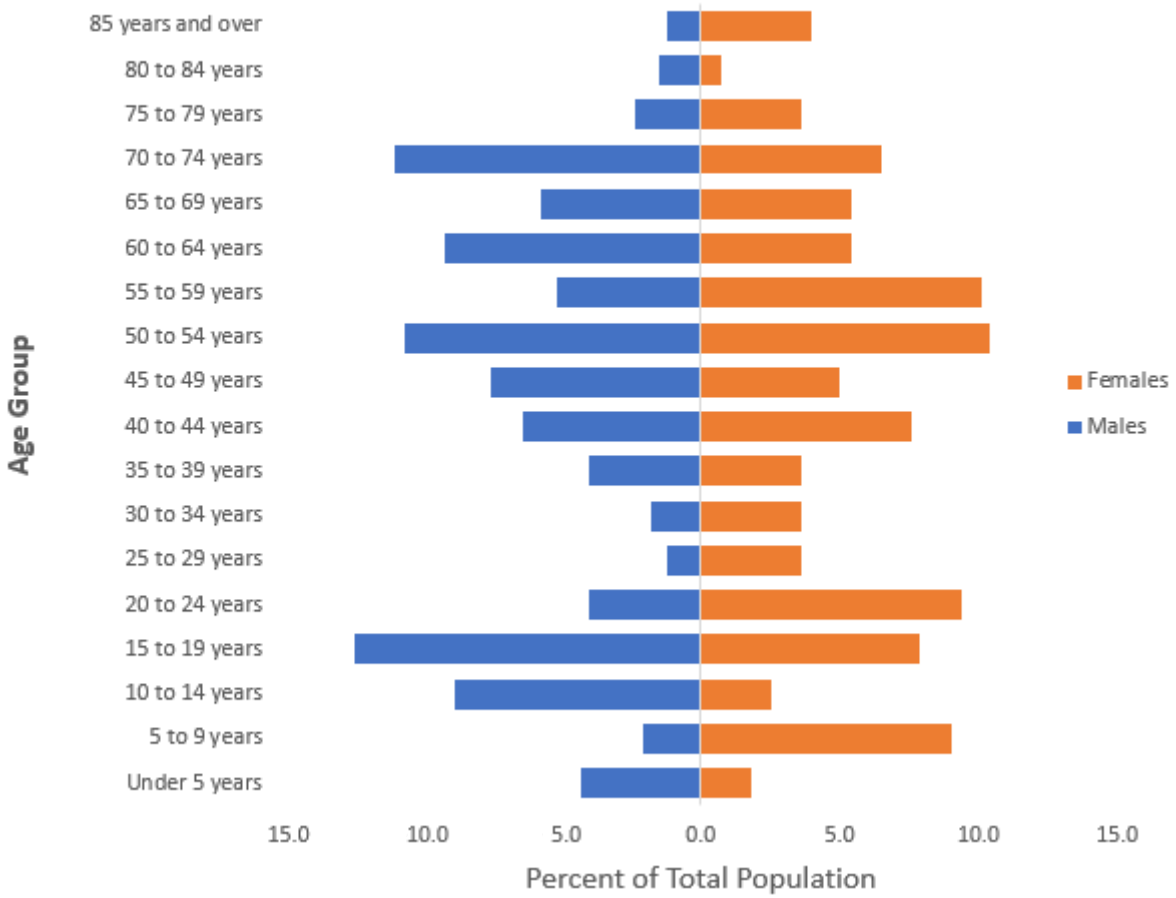
Cornell Township: T40N & 41N - R23W & 24W

Office location	Township Hall 9794 Boney Falls H Road Cornell, MI 49818
Mailing address	(send to supervisor or clerk)
Phone	906.384.6404
Total Area*	60.19 square miles (59.76 land) 38,521.6 acres (38,246.4 land)
Population (2019*)	605
Housing Units (2020)	352 (119 for seasonal, recreation or occasional use)
Total Households (2019*)	250
Average Household Size (2019*)	2.42 persons
Primary Fire Department	Cornell Township Volunteer Fire Dept.
Primary Police Department	Delta County Sheriff
School District(s)	Escanaba Area Public Schools
2020 State Equalized Valuation (residential)	$27,276,818

Source: U.S. Census Bureau and Michigan Department of Treasury, 2021. *2019 estimates

Cornell Township borders are formed by the Escanaba River on the east, Escanaba township on the south, Menominee County on the west, and Marquette County on the north. It is 9 miles across at its widest point and 8 miles at its longest. Over 80 percent is forested and about 10 percent of the land area is used for agriculture. There is a small amount of publicly-owned land, but a large amount of land in Commercial Forest Reserve that is available to the public. A store and post office are found in the community of Cornell. An elementary school and road commission garage in the community have been closed for several years. Residences are scattered and land ownership is mostly in plots of at least 40 acres. More than a third of the housing units are camps or cottages. CR426 is the main transportation route. Dormant train tracks of the Escanaba & Lake Superior Railroad parallels CR426 for its entire route through the township.

Cornell Township Population by Age and Sex (2019 est.)



2019 Median Age: 47.2
2010 Median Age: 47.6
2000 Median Age: 42.4

Source: U.S. Census Bureau, 2019 and 2020. Compiled by CUPPAD Regional Commission, 2021.

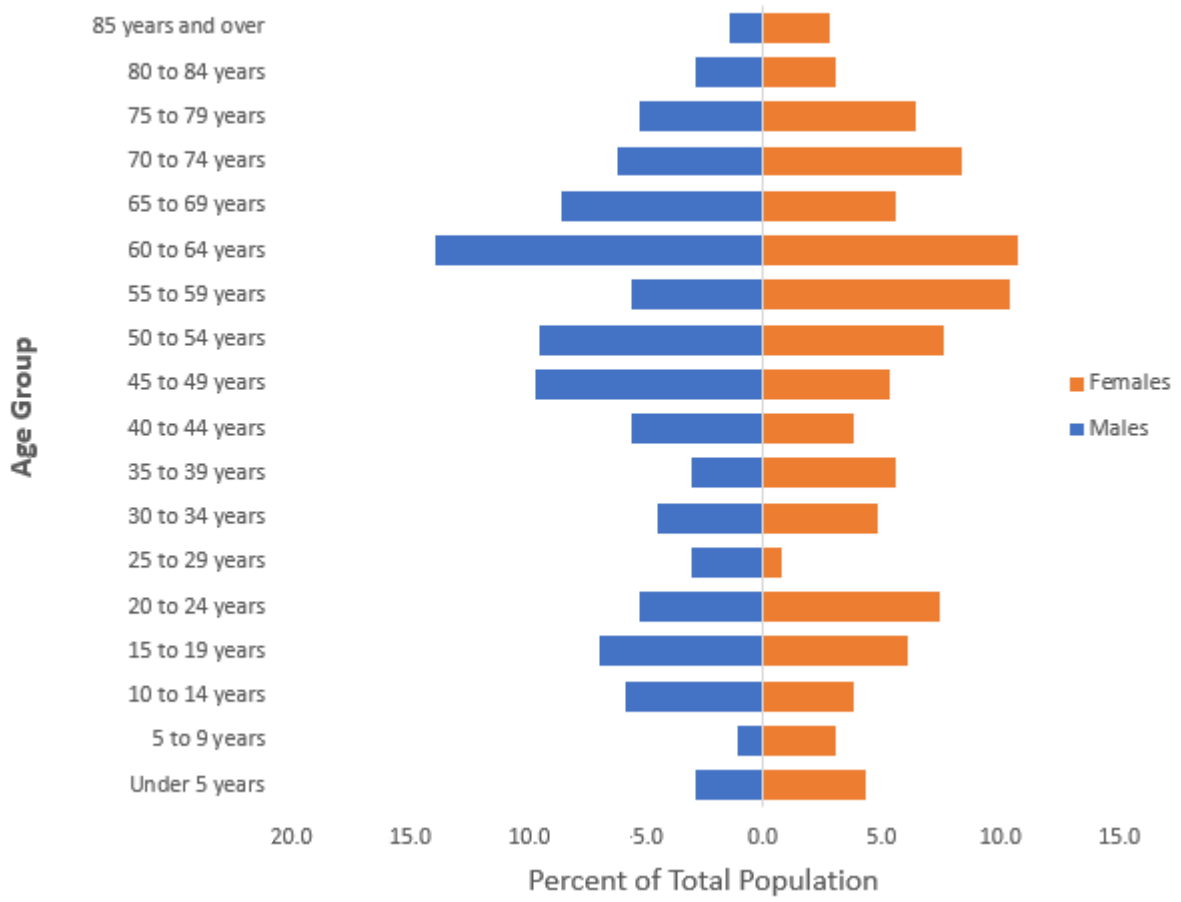
Ensign Township: T40N & 41N - R20W, 21W & 22W

Office location	Township Hall 9498 24th Road Rapid River, MI 49878
Mailing address	(send to supervisor or clerk)
Phone	906.474.9231
Total Area	65.79 square miles (58.97 land) 42,105.6 acres (37,740.8 land)
Population (2019*)	756
Housing Units (2019*)	518 (182 for seasonal, recreational or occasional use)
Total Households (2019*)	345
Average Household Size (2019*)	2.19 persons
Primary Fire Department	Ensign Township Volunteer Fire Dept.
Primary Police Department	Delta County Sheriff
School District(s)	Rapid River Public Schools
2020 State Equalized Valuation (residential)	$37,360,031

Source: U.S. Census Bureau and Michigan Department of Treasury, 2021. *2019 estimates

Ensign Township extends about 11 miles across at its widest point and 7 miles north-south. Approximately 7 miles of Little Bay de Noc forms most of the western boundary. On the east, Nahma township and over 3 miles of Big Bay de Noc shoreline define the boundaries. The township adjoins Masonville and Bay de Noc on the north and south respectively. Over 80 percent of the land area is forested and more than a third is within the Hiawatha National Forest. Development consists almost entirely of scattered residential and seasonal or recreational use dwellings that make up 34 percent of all housing units. Highway US-2 traverses the township with the Canadian National Railroad running parallel a short distance to the north. Besides US-2, county roads 513, 511 and 503 are the most important transportation routes.

Ensign Township Population by Age and Sex (2019 est.)



2019 Median Age: 51.9
2010 Median Age: 53.1
2000 Median Age: 43.8

Source: U.S. Census Bureau, 2019 and 2020. Compiled by CUPPAD Regional Commission, 2021.

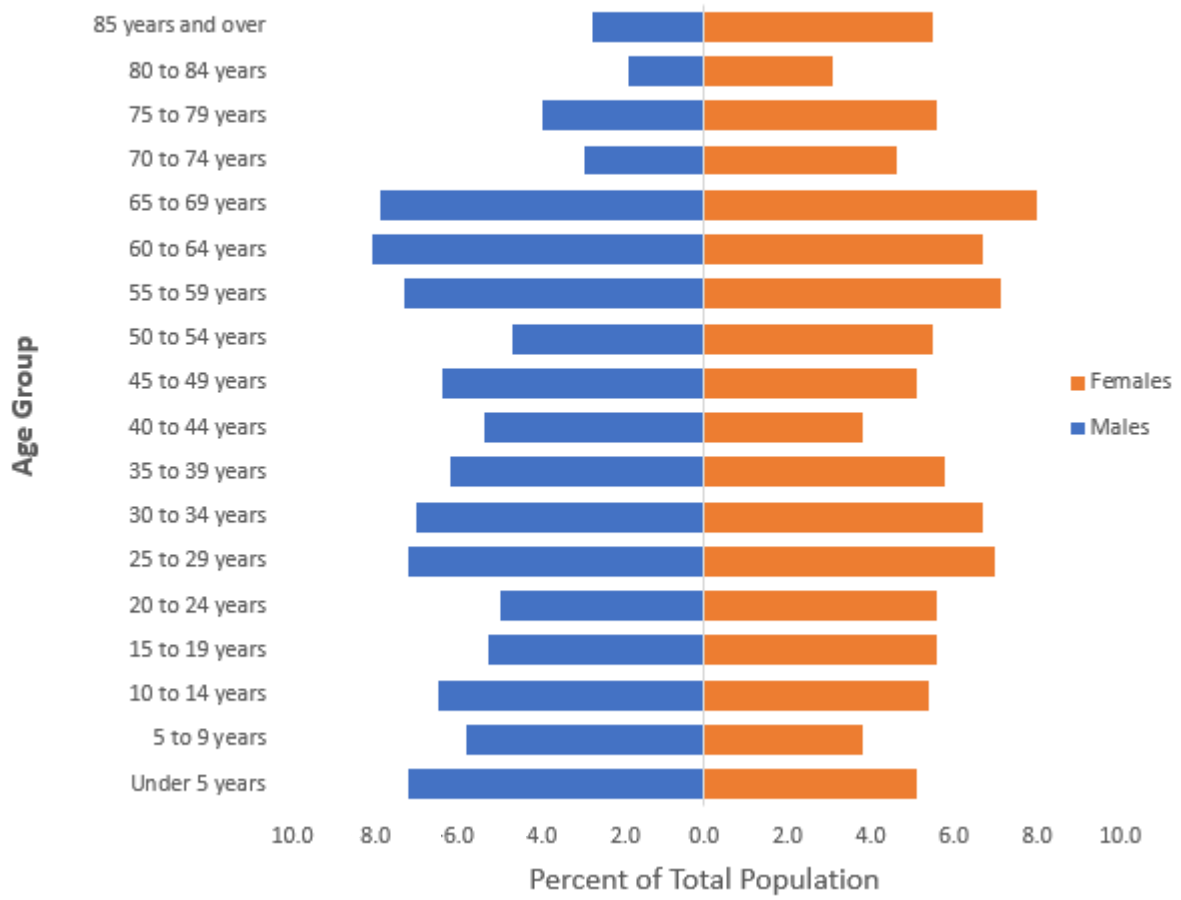
City of Escanaba: T38N & 39N - R22W & 23W

Office location	City Hall 410 Ludington Street Escanaba, MI 49829
Mailing address	same as above
Phone	906.786.9402
E-mail	customerservice@escanaba.org
Total Area	16.51 square miles (12.66 land) 10,566.4 acres (8,102.4 land)
Population (2019*)	12,251
Housing Units (2019*)	6,341 (620 for seasonal, recreational or occasional use)
Total Households (2019*)	5,893
Average Household Size (2019*)	2.60 persons
Primary Fire Department	Escanaba Public Safety Dept.
Primary Police Department	Escanaba Public Safety Dept.
School District(s)	Escanaba Area Public Schools
2020 State Equalized Valuation (residential)	$201,013,950

Source: U.S. Census Bureau and Michigan Department of Treasury, 2021. *2019 estimates

Escanaba (city) is the county's seat of government and service, employment and population center. OSF St. Francis Hospital, Delta County Airport, Bay de Noc Community College and a State Office Building are all located within the city. The extensive lakeshore includes a major iron ore shipping facility, modern marina and large public park areas. Municipal water (surface) and wastewater serve the residents and businesses. Trunklines US-2/41 and M-35 converge in the city. Escanaba is a destination point for iron ore delivered over the Canadian National Railroad from the Marquette Iron Range. The east-west Canadian National route passes through the northwestern section of the city. The Escanaba and Lake Superior Railroad also provide service within and through the city.

City of Escanaba Population by Age and Sex (2019 est.)



2019 Median Age: 43.4
2010 Median Age: 41.4
2000 Median Age: 40.1

Source: U.S. Census Bureau, 2019 and 2020. Compiled by CUPPAD Regional Commission, 2021.

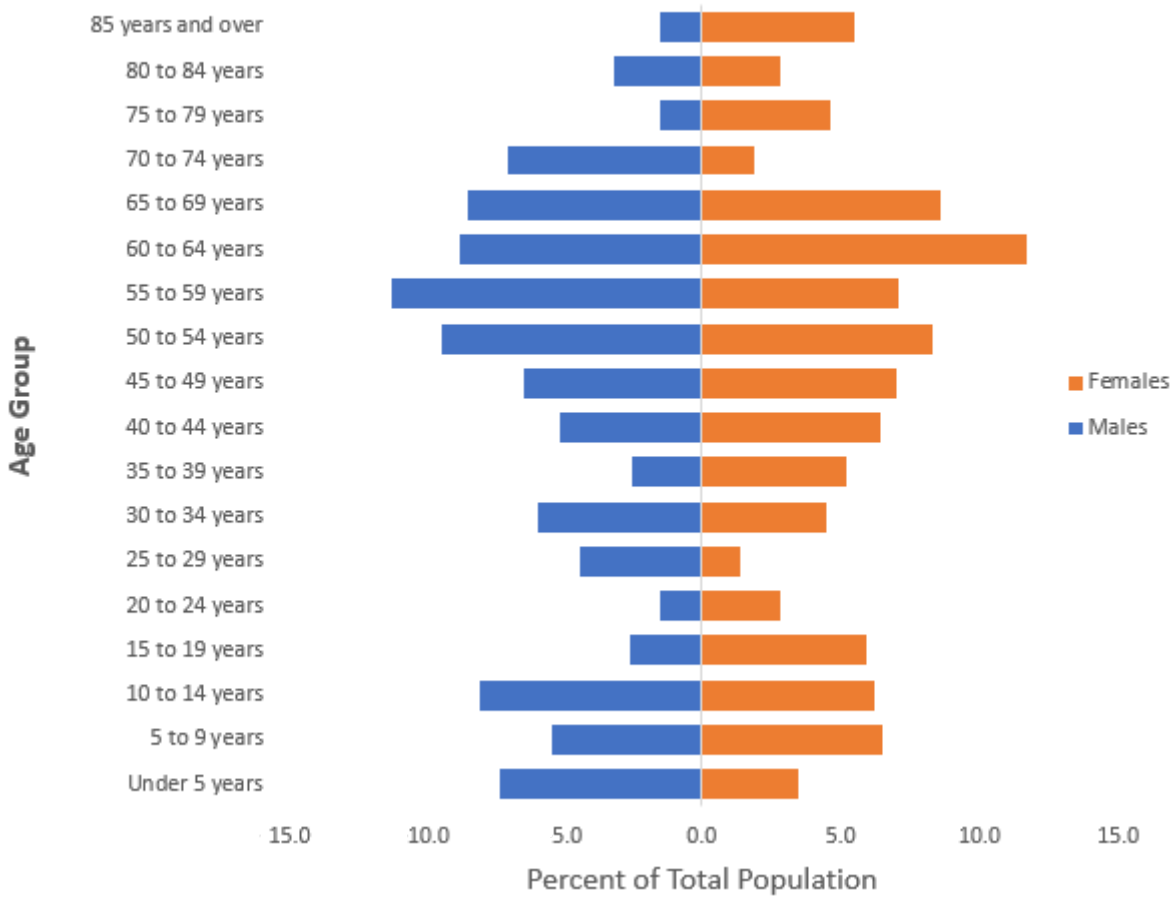
Escanaba Township: T40N - R22W, 23W & 24W

Office location	Township Hall 4618 Co 416 20th Road Gladstone, MI 49837
Mailing address	(send to supervisor or clerk)
Phone	906.786.6200
Total Area	60.32 square miles (59.57 land) 38,604.8 acres (38,124.8 land)
Population (2019*)	3,399
Housing Units (2019*)	1,526 (104 for seasonal, recreational or occasional use)
Total Households (2019*)	1,390
Average Household Size (2019*)	2.43 persons
Primary Fire Department	Escanaba Township Volunteer Fire Dept.
Primary Police Department	Delta County Sheriff
School District(s)	Gladstone Area Schools
2020 State Equalized Valuation (residential)	$118,129,680

Source: U.S. Census Bureau and Michigan Department of Treasury, 2021. *2019 estimates

Escanaba Township is over 13 miles wide stretching from Menominee County on the west to Little Bay de Noc on the east. About 65 percent of the township is forest covered and about 16 percent is used for agricultural purposes. Scattered commercial development is found along trunklines and major county roads (US-2/41, M-35, CR 420 and CR 426). Canadian National and Escanaba and Lake Superior railroads run through the township. Considerable residential development has occurred over the past 20 years - especially in the eastern portion of the township.

Escanaba Township Population by Age and Sex (2019 est.)



2019 Median Age: 50.4
2010 Median Age: 45.7
2000 Median Age: 38.8

Source: U.S. Census Bureau, 2019 and 2020. Compiled by CUPPAD Regional Commission, 2021.

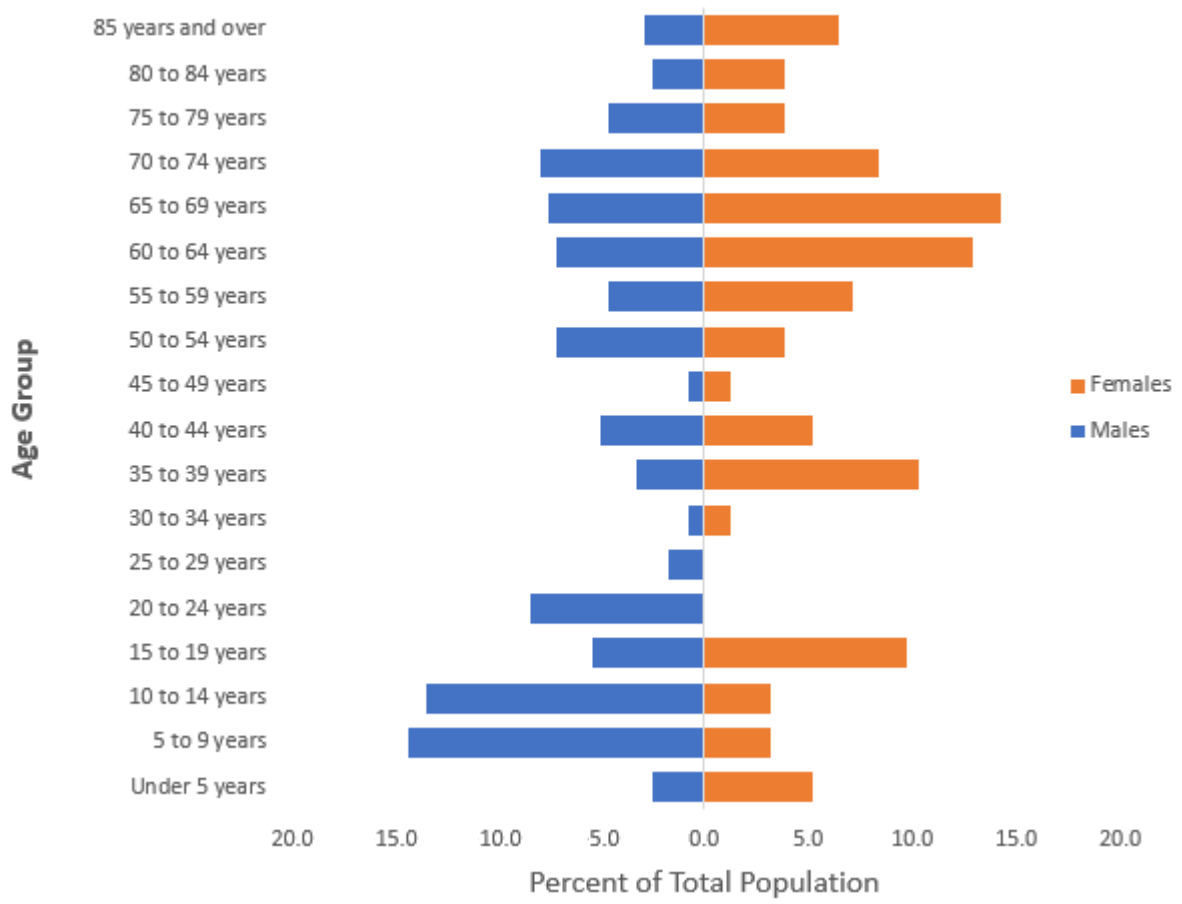
Fairbanks Township: T37N, 38N & 39N - R18W, 19W & 20W

Office location	Township Hall 13717 11th Road Garden, MI 49835
Mailing address	(send to supervisor or clerk)
Phone	906.644.2027
Total Area*	299.23 square miles (47.19 land) 191,507 acres (30,201.6 land)
Population (2019*)	394
Housing Units (2019*)	278 (136 for seasonal, recreational or occasional use)
Total Households (2019*)	166
Average Household Size (2019*)	2.37 persons
Primary Fire Department	Garden Township Volunteer Fire Department (contracted)
Primary Police Department	Delta County Sheriff
School District(s)	Big Bay de Noc School District
2020 State Equalized Valuation (residential)	$27,963,400

Source: U.S. Census Bureau and Michigan Department of Treasury, 2021. *2019 estimates

Fairbanks Township is located at the southern tip of the Garden Peninsula and includes the islands of St. Martins, Summer, Poverty, Little Summer, North Gull, South Gull, and Little Gull. Its only land border is with Garden township. It is about 70 percent forest-covered and about a quarter of the land area is devoted to agricultural use. Historic development was driven by farming and fishing. Approximately half of the housing units are not primary residences. Commercial development is limited. Commercial fishing boats operate from the harbor in the community of Fairport. Sac Bay County Park and Fayette State Park are popular recreational points. Highway M-183 is the principal transportation route.

Fairbanks Township Population by Age and Sex (2019 est.)



2019 Median Age: 52.7
2010 Median Age: 55.2
2000 Median Age: 46.6

Source: U.S. Census Bureau, 2019 and 2020. Compiled by CUPPAD Regional Commission, 2021.

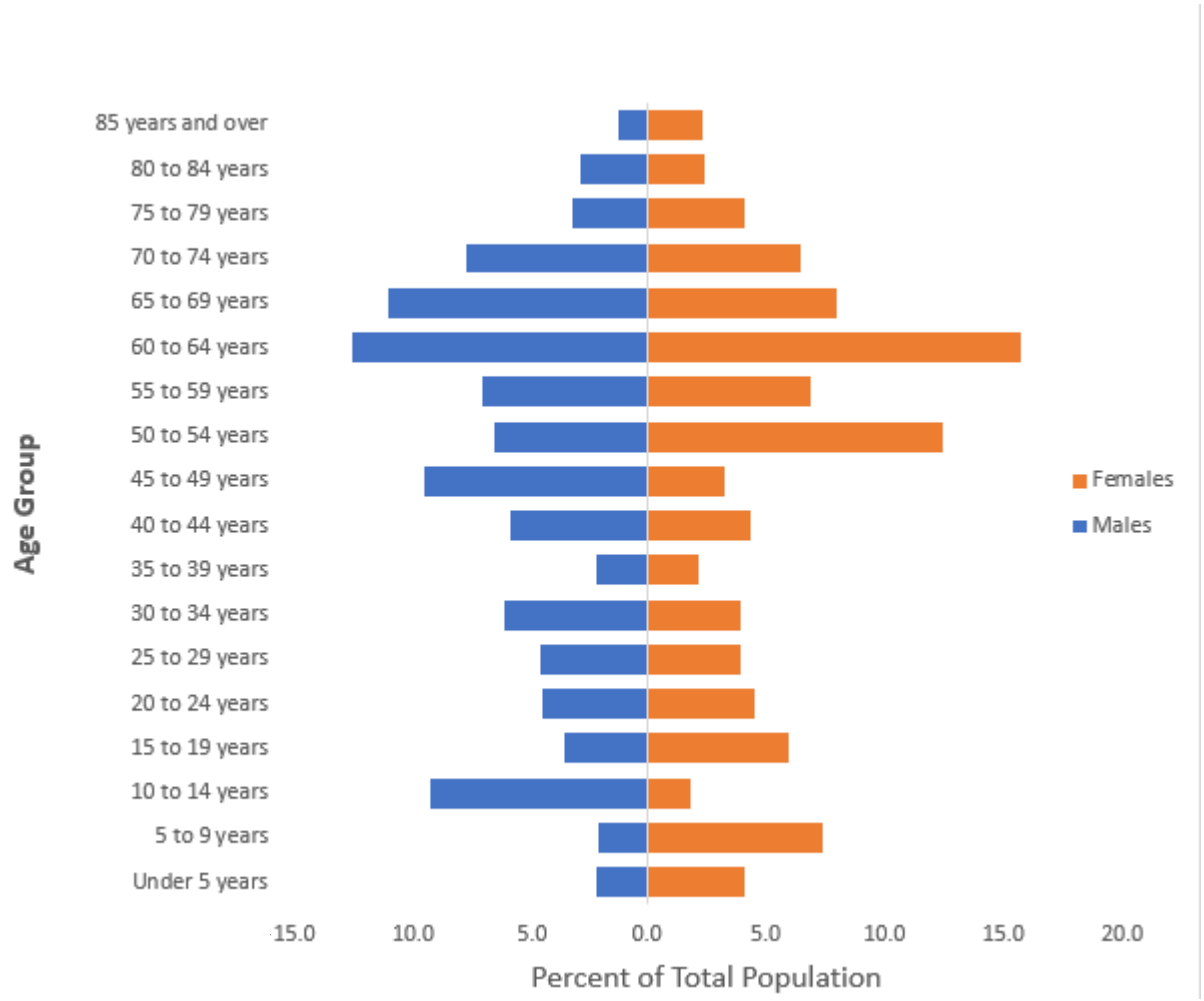
Ford River Township: T37N, 38N & 39N - R 23W & 24W

Office location	Township Hall 3845 K Road Bark River, MI 49807
Mailing address	same as above
Phone	906.786.8532
Total Area	65.27 square miles (64.81 land) 41,772.8 acres (41,478.4 land)
Population (2019*)	2,063
Housing Units (2019*)	1,134 (221 for seasonal, recreational or occasional use)
Total Households (2019*)	1,022
Average Household Size (2019*)	2.02 persons
Primary Fire Department	Ford River Township Volunteer Fire Dept.
Primary Police Department	Delta County Sheriff
School District(s)	Escanaba Area Public Schools
2020 State Equalized Valuation (residential)	$92,707,100

Source: U.S. Census Bureau and Michigan Department of Treasury, 2021. *2019 estimates

Ford River Township extends from Menominee County to the city of Escanaba along Lake Michigan. Much of its interior is in state ownership - in all, about 30 percent. Forests are the predominate land cover - about 80 percent. Wetland areas cover more than 10 percent of the land area. Most development is found along and near highway M-35, the major transportation route. Commercial development is mostly of the hospitality type. Fuller County Park is along the shoreline at the mouth of the Bark River and a public boat launch is at the Ford River mouth. A public water system (wells) serves 192 homes and businesses in the community of Ford River. The system includes elevated storage (capacity just under 50,000 gallons), 22 hydrants and pumping facilities. The township hall, fire hall and elementary school are along CR 521. Highway US-2/41 and Canadian National Railroad pass through the northern part of the township.

Ford River Township Population by Age and Sex (2019 est.)



2019 Median Age: 52.7
2010 Median Age: 49.9
2000 Median Age: 42.1

Source: U.S. Census Bureau, 2019 and 2020. Compiled by CUPPAD Regional Commission, 2021.

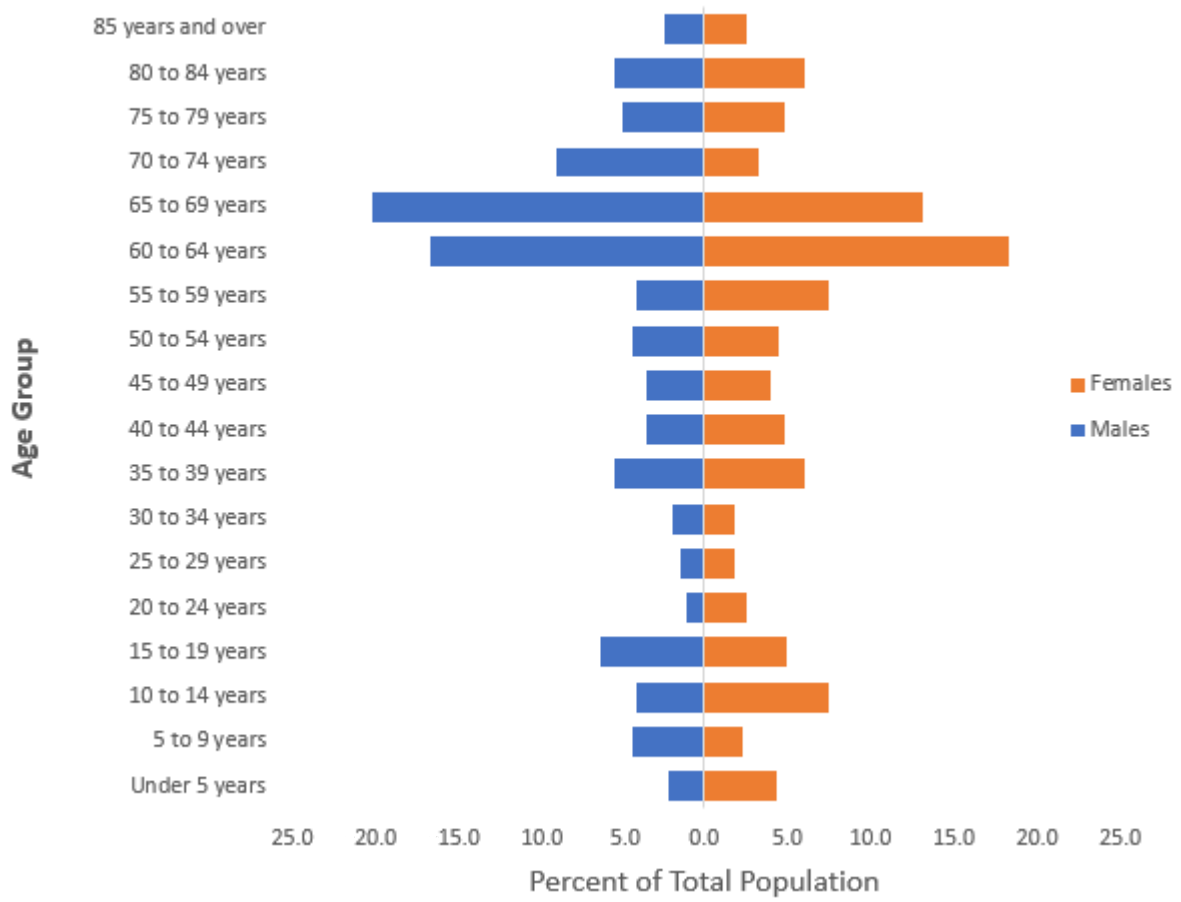
Garden Township: T37N, 38N, 39N, 40N, 41N, 42N & 43N - 18W, 19W & 20W

Office location	Garden Community Building 6316 State Street Garden, MI 49835
Mailing address	P.O. Box 224 Garden, MI 49835
Phone	906.644.7602
Total Area	184.39 square miles (159.92 land) 118,009.6 acres (102,348.8 land)
Population (2019*)	768
Housing Units (2020)	647 (277 for seasonal, recreational or occasional use)
Total Households (2019*)	349
Average Household Size (2019*)	2.19 persons
Primary Fire Department	Garden Township Volunteer Fire Dept.
Primary Police Department	Delta County Sheriff
School District(s)	Big Bay de Noc School District
2020 State Equalized Valuation (residential)	$47,632,600 (includes Village of Garden SEV)

Source: U.S. Census Bureau and Michigan Department of Treasury, 2021. *2019 estimates

Garden Township, from north to south spans 31 miles and is no more than 6 miles wide. Approximately 70 percent of the land area is in state or federal (Hiawatha National Forest) ownership. Forests and wetlands cover about 90 percent of the land. Most residential and commercial development lies along and south of highway US-2. The Big Bay de Noc School is about a mile south of US-2. Forty-two percent of the housing units are not primary residences. The Canadian National Railroad crosses through the center of the township north of US-2. M-183 and county roads 442, 440 and 436 are the principal roadways in addition to US-2.

Garden Township Population by Age and Sex (2019 est.)



2019 Median Age: 61.7
2010 Median Age: 53.8
2000 Median Age: 45.6

Source: U.S. Census Bureau, 2019 and 2020. Compiled by CUPPAD Regional Commission, 2021.

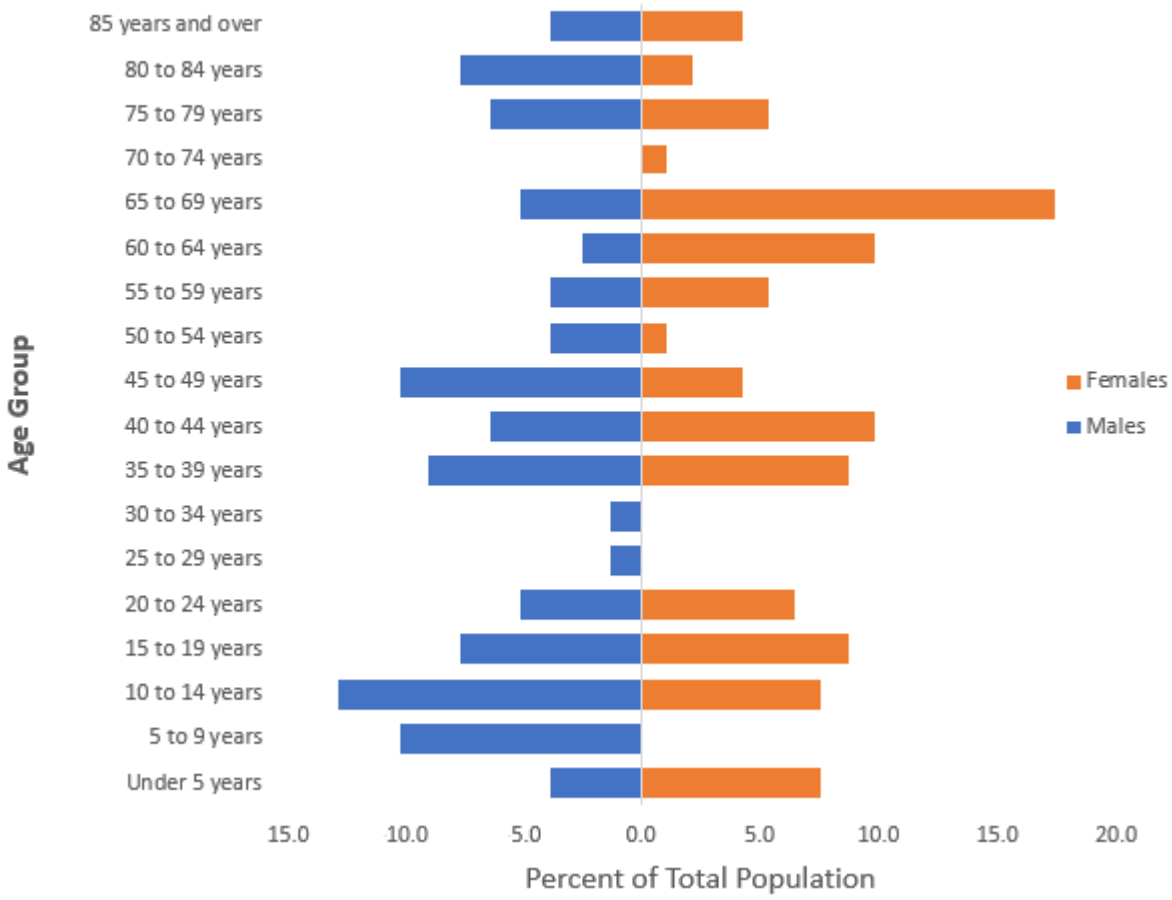
Village of Garden: T39N - R18W

Office location	Village Hall 15951 Garden Avenue Garden, MI 49835
Mailing address	P.O. Box 167 Garden, MI 49835
Phone	906.644.2423
Total Area	1.02 square miles (0.85 land) 652.8 acres (544.0 land)
Population (2019*)	171
Housing Units (2019*)	120 (36 for seasonal, recreational or occasional use)
Total Households (2019*)	70
Average Household Size (2019*)	2.37 persons
Primary Fire Department	Garden Township Volunteer Fire Dept.
Primary Police Department	Delta County Sheriff
School District(s)	Big Bay de Noc School District
2020 State Equalized Valuation (residential)	$ (included with township S.E.V.)

Source: U.S. Census Bureau and Michigan Department of Treasury, 2021. *2019 estimates

Garden (village) envelopes much of Garden Bay. The village takes in a land area of slightly more than one square mile and is the commercial, governmental, and population center of the Garden peninsula. M-183 (State Street) winds through the middle of the village and serves as the main street. A municipal water system (wells) includes service to homes and businesses in the village and township.

Village of Garden Population by Age and Sex (2019 est.)



2019 Median Age: 44.1
2010 Median Age: 49.4
2000 Median Age: 45.0

Source: U.S. Census Bureau, 2019 and 2020. Compiled by CUPPAD Regional Commission, 2021.

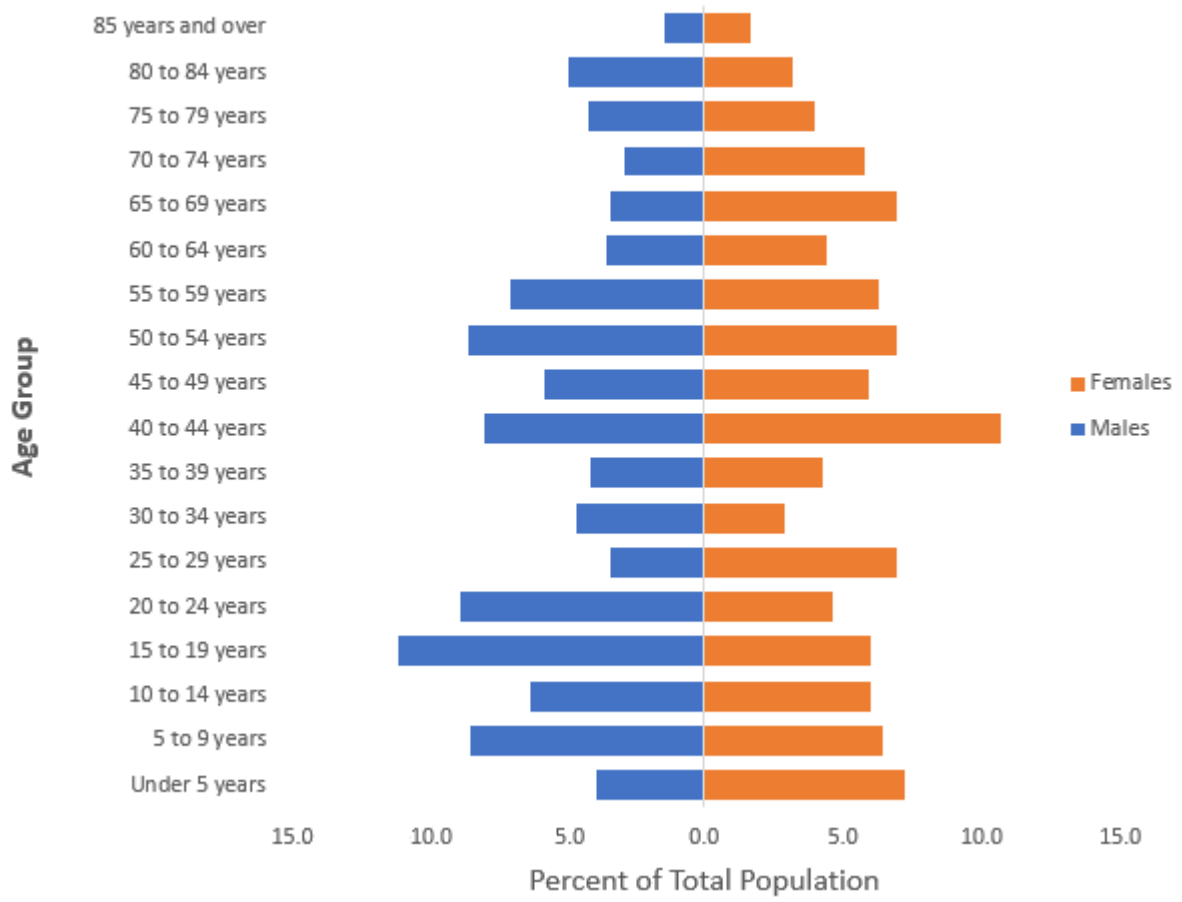
City of Gladstone: T40N - R22W

Office location	City Hall 1100 Delta Avenue Gladstone, MI 49837
Mailing address	same as above
Phone	906.428.2311
Total Area	7.89 square miles (4.96 land) 5,049.6 acres (3,174.4 land)
Population (2019*)	4,753
Housing Units (2019*)	2,546 (249 for seasonal, recreational and occasional use)
Total Households (2019*)	2,005
Average Household Size (2019*)	2.35 persons
Primary Fire Department	Gladstone Public Safety Department
Primary Police Department	Gladstone Public Safety Department
School District(s)	Gladstone Area Schools
2020 State Equalized Valuation (residential)	$96,306,897

Source: U.S. Census Bureau and Michigan Department of Treasury, 2021. *2019 estimates

Gladstone (city) is the second largest population and commercial center in the county. The original settlement is located east of US-2, close to Little Bay de Noc. A deep natural waterway permits large vessels to off-load bulk materials such as salt and bituminous. Over the past 20 years, significant development has taken place at higher elevations (bluff) on the city's west side. In addition to new home construction, an industrial park and high school are situated along M-35 in the bluff area. Municipal water (surface), wastewater, and electrical distribution systems serve most residences and businesses. Canadian National Railroad maintenance, fueling and switching facilities are found along the west side of highway US-2/41. Highway M-35 intersects with US-2/41 near the center of the city.

City of Gladstone Population by Age and Sex (2019 est.)



2019 Median Age: 41.7
2010 Median Age: 43.6
2000 Median Age: 39.9

Source: U.S. Census Bureau, 2019 and 2020. Compiled by CUPPAD Regional Commission, 2021.

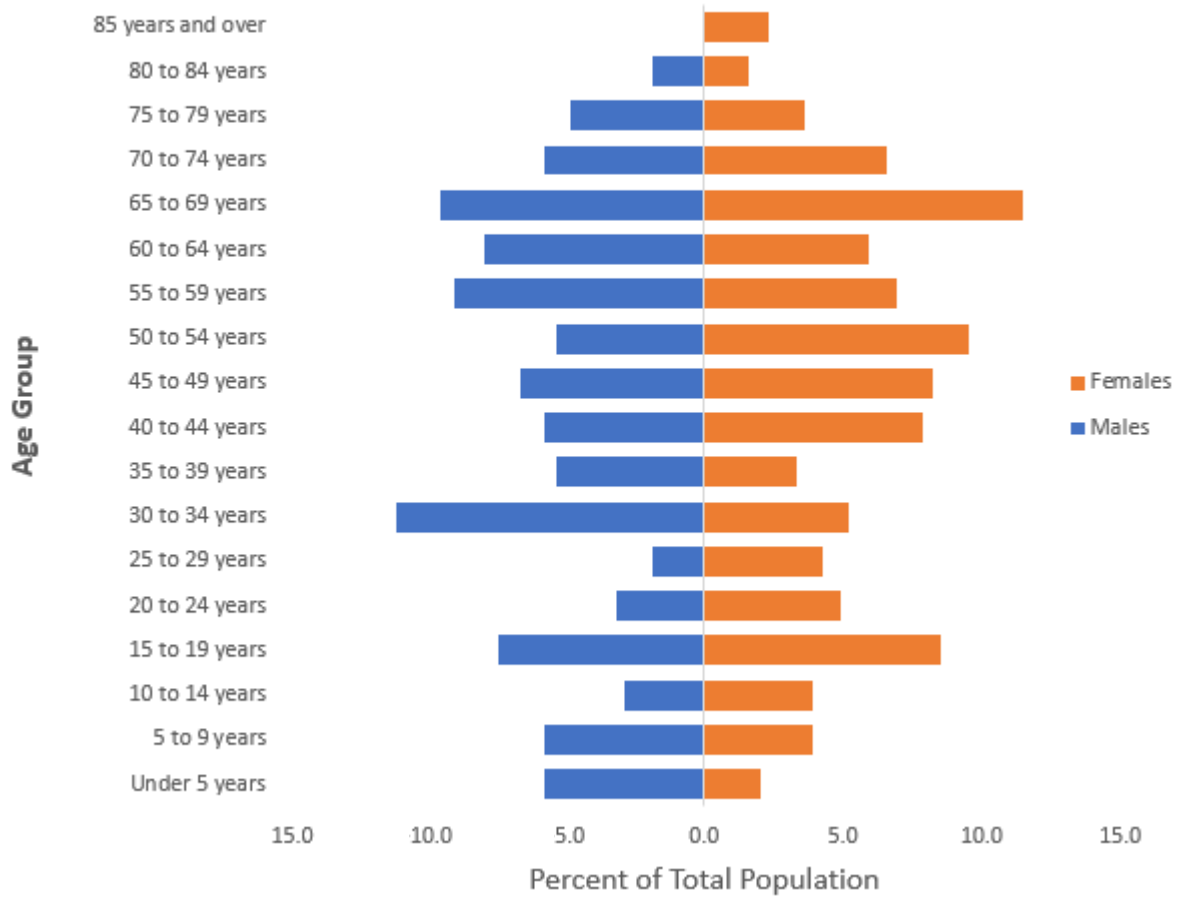
Maple Ridge Township: T42N & 43N - R22W & 23W

Office location	Maple Ridge Community Building 3892 W. Maple Ridge 37th Road Rock, MI 49880
Mailing address	(send to supervisor or clerk)
Phone	906.356.6311
Total Area	108.23 square miles (108.23 land) 69,267.2 acres
Population (2019*)	683
Housing Units (2019*)	476 (143 for seasonal, recreational or occasional use)
Total Households (2019*)	320
Average Household Size (2019*)	2.13 persons
Primary Fire Department	Tri-Township Volunteer Fire Dept.
Primary Police Department	Delta County Sheriff
School District(s)	Mid Peninsula School District
2020 State Equalized Valuation (residential)	$33,089,500

Source: U.S. Census Bureau and Michigan Department of Treasury, 2021. *2019 estimates

Maple Ridge Township is shaped in an "L", extending for 12 miles at its longest and widest points. Forests cover about 80 percent of the land area; wetlands cover about 10 percent. State holdings make up about 20 percent of the total township land area. Highway M-35 angles through the township and is paralleled by the Canadian National Railroad. CR432 and the Saint Nicholas Road are among the most significant local roads. The largest collection of homes and commercial establishments is found in the community of Rock. A municipal water system (wells) was constructed in 1990 and serves about 100 households and businesses. Thirty percent of all township housing units are used as camps or cottages.

Maple Ridge Township Population by Age and Sex (2019 est.)



2019 Median Age: 46.4
2010 Median Age: 47.9
2000 Median Age: 45.0

Source: U.S. Census Bureau, 2019 and 2020. Compiled by CUPPAD Regional Commission, 2021.

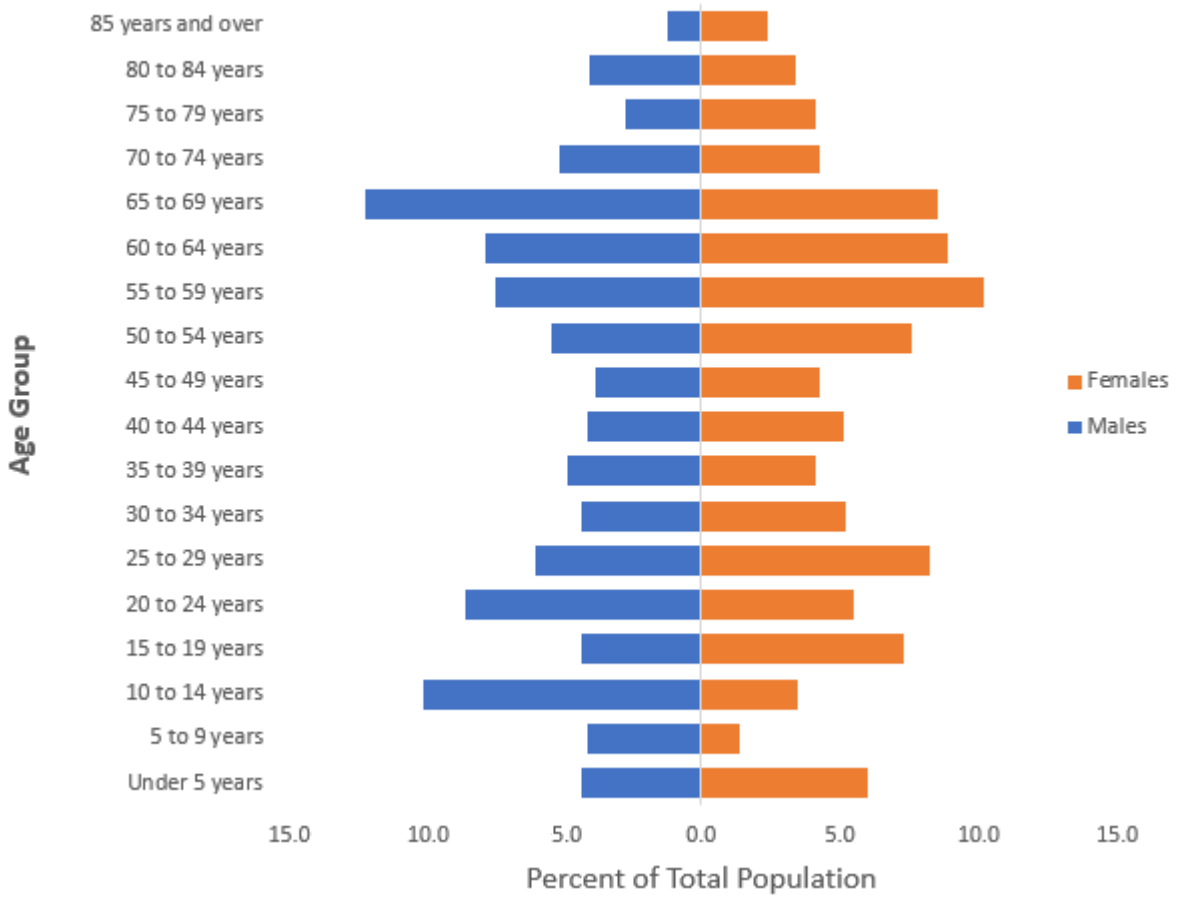
Masonville Township: T41N, 42N, & 43N - R20W & 21W

Office location	Omni Center, 10574 North Main Street Rapid River, MI 49878
Mailing address	P.O. Box 166, Rapid River, MI 49878
Phone	906.474.9505
Total Area*	170.41 square miles (167.67 land) 109,062.4 acres (107,308.8 land)
Population (2019*)	1,493
Housing Units (2019*)	1,023 (296 for seasonal, recreational or occasional use)
Total Households (2019*)	682
Average Household Size (2019*)	2.18 persons
Primary Fire Department	Masonville Township Volunteer Fire Department
Primary Police Department	Delta County Sheriff
School District(s)	Rapid River Public Schools
2020 State Equalized Valuation (residential)	$60,906,900

Source: U.S. Census Bureau and Michigan Department of Treasury, 2021. *2019 estimates

Masonville Township at its widest and longest points extends for 10 miles and 18 miles respectively. In terms of land area, Masonville is the largest governmental unit in the county followed closely by Nahma township. About two-thirds of the land area is within the Hiawatha National Forest; about 80 percent of the township is forest-covered. Wetlands cover over 10 percent of the land area. Most commercial development is found along or near trunklines US-2 and US-41 - mostly near the community of Rapid River. Most of the township's residents live along and south of US-2 near the head of Little Bay de Noc. Twenty-eight percent of township housing units are not used as primary residences. The Canadian National Railroad passes through the township near the lakeshore. In addition to trunklines, Bayshore Drive, CR513, CR509, and CR 428 are the most heavily used roadways in the township. A wastewater collection system in Rapid River pumps to the Gladstone Wastewater Treatment Plant.

Masonville Township Population by Age and Sex (2019 est.)



2019 Median Age: 47.6
2010 Median Age: 49.1
2000 Median Age: 50.8

Source: U.S. Census Bureau, 2019 and 2020. Compiled by CUPPAD Regional Commission, 2021.

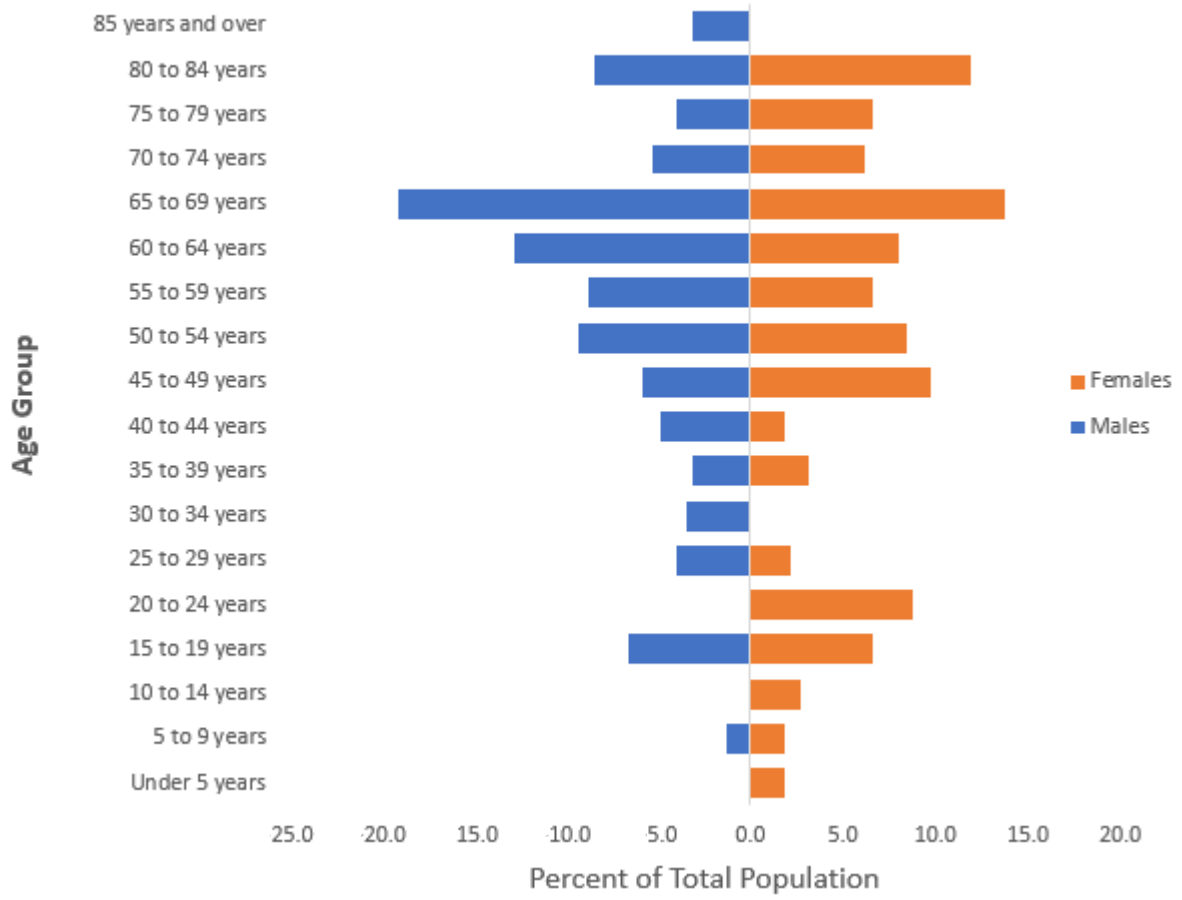
Nahma Township: T40N, 41N, 42N & 43N - R19W & 20W

Office location	Township Hall 13751 Wells Street 21.1 Nahma, MI 49864
Mailing address	(send to supervisor or clerk)
Total Area	188.87 square miles (166.24 land) 120,876.8 acres (106,393.6 land)
Population (2019*)	452
Housing Units (2019*)	619 (391 for seasonal, recreational and occasional use)
Total Households (2019*)	252
Average Household Size (2019*)	1.79 persons
Primary Fire Department	Nahma Township Volunteer Fire Dept.
Primary Police Department	Delta County Sheriff
School District(s)	Big Bay de Noc School District
2020 State Equalized Valuation (residential)	$47,073,992

Source: U.S. Census Bureau and Michigan Department of Treasury, 2021. *2019 estimates

Nahma Township stretches 22 miles north-south from Big Bay de Noc to Alger County. The east-west distance between adjoining Masonville and Garden townships is generally 8 miles. Federal land ownership (Hiawatha National Forest) accounts for two-thirds of the entire township land area. About 80 percent of the land area is forested and wetlands are found over about 15 percent. Trunkline US-2 and the Canadian National Railroad run parallel through the southern end of the township. Sixty-three percent of the housing units are used seasonally or for recreation. Federal Forest Highway 13 and US-2 are the most important transportation routes. County roads 495 and 499 provide access to the most development along the lakeshore and the community of Nahma. A public water (well) system supplies about 50 residences and businesses. Storage is accommodated in a 100,000 gallon elevated tank.

Nahma Township Population by Age and Sex (2019 est.)



2019 Median Age: 59.8
2010 Median Age: 53.9
2000 Median Age: 50.8

Source: U.S. Census Bureau, 2019 and 2020. Compiled by CUPPAD Regional Commission, 2021.

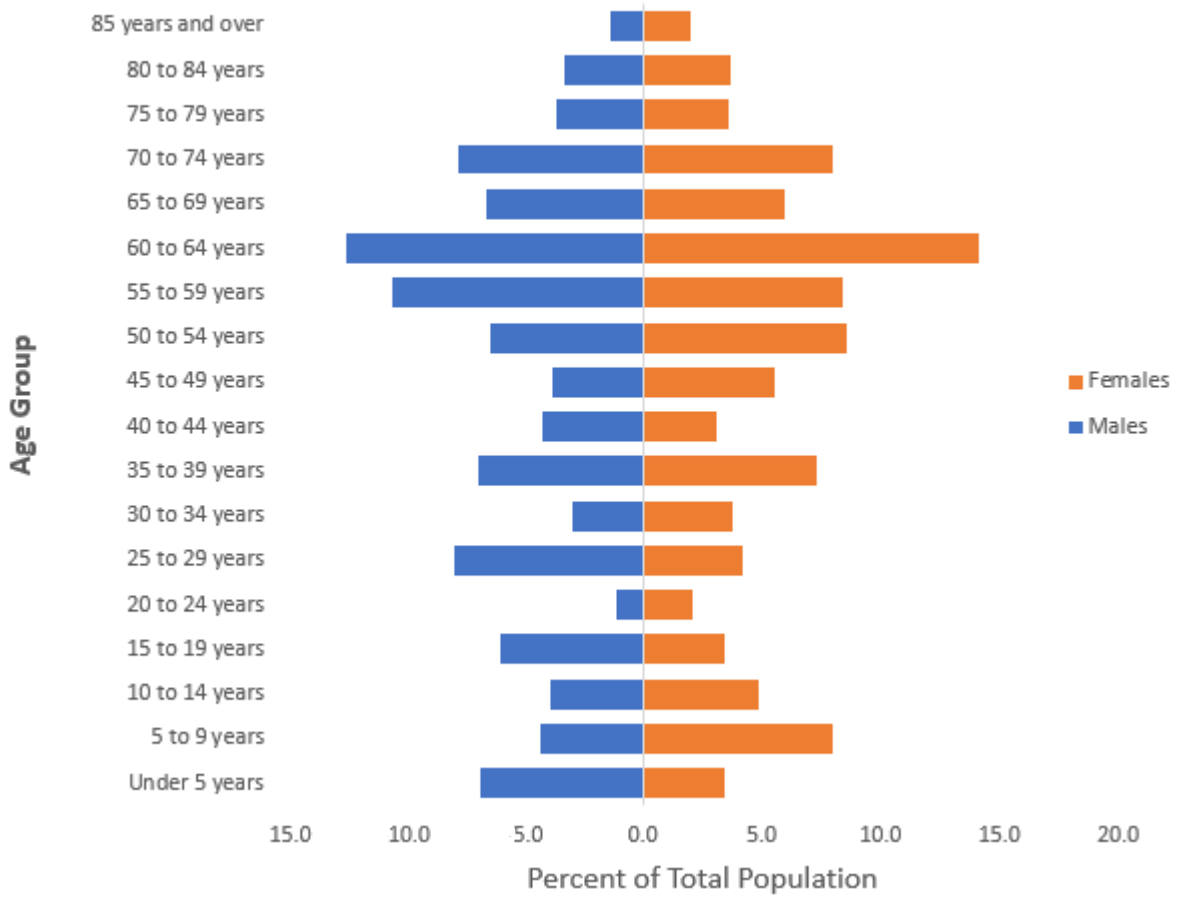
Wells Township: T39N - R22W, 23W & 24W

Office location	Township Hall 6436 North 8th Street Wells, MI 49894
Mailing address	P.O. Box 188 Wells, MI 49894
Phone	906.786.0839
Total Area	39.83 square miles (39.49 land) 25,491.2 acres (25,273.6 land)
Population (2019*)	4,759
Housing Units (2019*)	2,142 (141 for seasonal, recreational or occasional use)
Total Households (2019*)	1,977
Average Household Size (2019*)	2.41 persons
Primary Fire Department	Escanaba Public Safety Department (contracted)
Primary Police Department	Delta County Sheriff
School District(s)	Escanaba Area Public Schools
2020 State Equalized Valuation (residential)	$136,314,000

Source: U.S. Census Bureau and Michigan Department of Treasury, 2021. *2019 estimates

Wells Township lies within the Gladstone-Escanaba urban corridor. It extends for up to 10 miles east-west and 6 miles north-south. Areas along and near US-2 and the northeastern portion of the township are the most intensively developed. The county's largest industrial complex and employer, the Verso Escanaba Paper Mill, is located on the Escanaba River about 2 miles upstream from Little Bay de Noc. In terms of land cover, about 56 percent is forested and about 15 percent is wetland. The township-owned water distribution system supplies the community of Wells east of US-2. The system is supplied and maintained by the city of Escanaba.

Wells Township Population by Age and Sex (2019 est.)



2019 Median Age: 51.9
2010 Median Age: 45.7
2000 Median Age: 38.6

Source: U.S. Census Bureau, 2019 and 2020. Compiled by CUPPAD Regional Commission, 2021.

APPENDIX B

Historic Sites - Delta County

Historic Sites, Delta County		
Name	Location	Historic Significance
Charles Brotherton House	606 Ogden Avenue, Escanaba	Brotherton was a government surveyor who came to the Upper Peninsula in 1852. His survey and mapping work in laying out townships helped facilitate settlement across much of the region. The residential structure was listed on the state historic register in 1990.
Carnegie Public Library	201 South 7th Street, Escanaba	Opened in 1903, this structure is noted for architectural design. It was granted historic designations by the state and federal historic offices in 1976 and 1977 respectively.
Delta Hotel	624 Ludington Street, Escanaba	This brick and masonry 5-story structure opened in 1914 amid boom times in the area. It has been transformed to apartments and restaurant. It was added to the national historic register in 1998.
Samuel Elliot Farm	CR 483, Sac Bay area, Fairbanks township	Constructed in 1880, this frame farmhouse is noted for its design. It was listed as a state historic site in 1974.
Escanaba River Informational Designation	Pioneer Trail Park, Wells township	A marker that notes the relationship of the Escanaba River to its mention in "The Song of Hiawatha" by Henry Wadsworth Longfellow.
Fayette townsite	CR 483, Fairbanks township	The port town of Fayette was a bustling iron ore smelting company town that was settled in the 1860s. It was abandoned as industrial practices changed. It is within the Fayette Historic State Park and has undergone extensive restoration. National historic designation was granted in 1996.
Grand Island Indian Trail Informational Designation	CR 509, Masonville township	A marker was erected at the trailhead to commemorate the importance of this route connecting Lake Michigan and Lake Superior. State and national historic designations were approved in 1966 and 1968 respectively.
Henry Frank Wnuck Homestead	10921 Highway 41, Rapid River	A restored log cabin built in 1880.
Little Bay de Noc Informational Designation	Lake Shore Drive, Escanaba	A marker noting the historic importance of Little Bay de Noc to Noquet Indians and European settlers is found in the Ludington Park area. State historic designation was granted in 1957.
Ludington Hotel	223 Ludington Street, Escanaba	Constructed in 1864, the hotel is inextricably linked with Escanaba's history. The hotel affords a view of Little Bay de Noc and remains in operation. It gained listing on the state historic register in 1981.

Historic Sites, Delta County		
Name	Location	Historic Significance
Maple Ridge Workers Association Hall (Finn Hall)	CR 529, Rock	Finn Hall was built in 1914 and served as a social, intellectual and recreational center for persons of Finnish descent for many years. State historic designation was granted in 1978.
Peninsula Point Light Station	southern terminus of CR 513, Hiawatha National Forest, Bay de Noc township	An attached lighthouse keeper residence was destroyed by fire in 1959. The facility was operational from 1865 until 1936. It gained national historic listing in 1975.
Saint Lawrence Catholic Church	CR 499, Indian Point, Nahma township	This small church was built in 1882 and is associated with missionary work in the area. Designation as a state historic site was approved in 1972.
Saint Martin Island Light Station	St. Martin Island, Fairbanks township	The exoskeletal light tower served as a navigation aid for Lake Michigan ship traffic. It was built in 1905 and added to the national historic register in 1984.
Sand Point Lighthouse	12 Water Plant Road, Escanaba	This facility was completed in 1867 to guide shipping into Little Bay de Noc. It is now being restored by the Delta County Historical Society. State and national historic designations were approved in 1988 and 1997 respectively.
Sawmills Informational Designation	Pioneer Trail Park, Escanaba River, Wells township	A marker at this location relates the story of the area's early lumbering industry. State historic designation was granted in 1966.
Webster School Annex	1219 North 19th Street, Escanaba	Since demolished, this building was built in 1892 as a school and was later used for other public purposes. State historic designation was granted in 1977.

APPENDIX C

Hazard Risk Analysis

HAZARD RISK ANALYSIS

Hazards of all types were evaluated based primarily on the probability of an occurrence and severity of impact. Local residents from business and industry, police and fire agencies, emergency services, education, public health, medical services, transportation, planning and zoning, and local elected officials participated in a series of reviews and discussions. Hazards were ranked according to aspects and values determined by local evaluators. In all, about a dozen residents participated directly in the process during the creation of the original 2007 plan.

The likelihood of a particular hazard occurring is based on Delta County incidents to the extent that such information is available. Regional, state, and national data were used throughout. Injury and death potential was considered based on available county information and state and national sources. The impacted population was rated based known and potential incident locations in relation to current census data. Direct and indirect impacts were considered. Economic and corollary effects were determined by known conditions and anticipated future conditions.

For the 2007 Plan, the Committee utilized a ranking point score method arriving at a rating reflecting an order of importance of the threat within the county. This ranking is useful for planning purposes and is based on the most current information available.

For the 2013 updated plan, the Committee decided to revisit the hazard rankings. Rankings were revised through Local Emergency Preparedness Committee (LEPC) discussions that reflected current community concerns and incidents since approval of the original plan. At numerous meetings in 2013, the Committee discussed the rankings as presented in 2007 along with the data as presented in the Hazard chapter of this Plan. It was the Committee's concurrence that a number of issues warranted the rankings to change:

- Due to recent high-profile school shootings nationwide and local weapons-related incidents, the Committee gave school violence and workplace violence a higher hazard rating than in the 2007 plan.
- The Committee agreed that public health emergencies were more likely to occur and be widespread so this hazard's rating was also increased.
- Petroleum pipeline failures were put into the moderate risk category because pipelines in Delta County cross several rivers, and the spill in Kalamazoo highlighted the massive mitigation cost of river spills.
- The Committee also raised the hazard ranking of wildfires, because of its likelihood to occur in localized areas such as the Stonington Peninsula.

For the 2015 and 2021 updated plans, the Local Emergency Preparedness Committee (LEPC) reviewed the previous plan rankings and participated in re-ranking hazards during discussions at their regular meetings. The 2021 Plan included the addition of three hazards: cyber security, active shooter events, and mass casualty events. These hazards were added based on the

increase of high-profile incidents over recent years and additional guidance from federal agencies. Compared to other planning years, the rankings in 2021 saw some significant changes:

- Public health emergencies have increased in rank due to the experience of the COVID-19 pandemic. The experience revealed the significant nature of risk to the wider public of these events, as well as shortfalls in local, state, and federal planning that led to failures in response.
- A widespread failure of the electrical grid during an extreme temperature event in the State of Texas in early 2021 led to the increase in rank of infrastructure failures.
- Pipeline failures have increased in rank due to several incidents and animosity towards the development of new pipeline projects, including in the U.P.

The county hazard rankings and rating scores for the 2007, 2013, 2015, and 2021 plans are shown in the table below.

The "2013 Hazard Risk Assessment – Delta County" table summarizes if the hazard is identified in State HMP, declared disaster, identified in County HMP, if Hazard occurred since original HMP approval, and ranking

While the ranking is useful for planning purposes and is based on the most current information available and many hours of deliberation, it should not be assumed that lower ranked hazards would not occur. Most hazard events are extremely difficult to predict.

Table 3-1 Delta County Hazard Rankings					
Hazard	**2007 Plan**	**2013**	**2015**	**2021**	
	Ranking	**Ranking**	**Ranking**	**Ranking**	**Risk**
Hazardous Materials – Transportation	1	1	1	1	High
Snowstorms	3	3	3	2	
Ice & Sleet	2	2	2	3	
Structural Fires	12	15	4	4	
Public Health Emergencies	19	10	11	5	
Hazardous Materials – Fixed Site	6	6	21	6	
Infrastructure Failures	17	19	13	7	
Cyber Security	N/A	N/A	N/A	8	
Severe Wind	4	4	4	9	
Wildfires	15	17	10	10	
Lightning and Thunderstorms	5	5	7	11	
Transportation Accidents	18	20	6	12	
Active Shooter	N/A	N/A	N/A	13	**Moderate**
Workplace Violence	21	8	30	14	
School Violence	14	7	26	15	
Tornadoes	7	9	15	16	
Pipeline Failures	26*	27	22	17	
Dam Failures	24	24	25	18	
Mass Casualities	N/A	N/A	N/A	19	
Great Lakes Flooding	26*	26	19	20	
Riverine Flooding	25	25	12	21	
Urban Flooding	22	22	16	22	
Temperature Extremes	10	13	9	23	
Other Environmental (invasive, exotics, diseases,	19*	21	14	24	
Hail	16	18	23	25	**Low**
Drought	23	23	16	26	
Economic Recession/Adversity	13	16	8	27	
Civil Disturbance	28	28	23	28	
Bioterrorism	9	12	20	29	
Terrorism, Sabotage, WMD	8	11	18	30	
Public Assembly Events	11	14	27	31	
Scrap Tire Fires	29	29	31	32	

Subsidence	30*	32	28	33	
Earthquakes	30*	30	29	34	
Nuclear Power Plant Accidents	30*	31	31	35	

2013 HAZARD RISK ASSESSMENT – DELTA COUNTY					
Hazard	**Identified in State HMP?**	**Declared Disaster?**	**Identified in County HMP?**	**Occurred Since Original HMP Approval?**	**Ranking**
1 – Wildfires	Y		Y	Y	11
2 - Riverine Flooding	Y		Y	Y	26
3 - Great Lakes Flooding	Y		Y	N	27
4 - Urban Flooding	Y		Y	Y	23
5 – Tornadoes	Y		Y	Y	9
6 - Severe Wind	Y	2005	Y	Y	4
7 - Lightning & Thunderstorms	Y		Y	Y	5
8 – Hail	Y		Y	Y	17
9 – Snowstorms	Y	1978	Y	Y	3
10- Ice & Sleet Storms	Y		Y	Y	2
11- Temperature Extremes	Y	1999	Y	Y	12
12- Drought	Y	1977	Y	N	24
13- Earthquakes	Y		Y	N	30
14- Other Environmental (invasive exotics, diseases, etc.)	Y		Y	Y	22
15- Infrastructure Failures	Y		Y	Y	18
16- Structural Fires	Y		Y	Y	14
17- Dam Failures	Y		Y	N	25
18- Nuclear Power Plant Accidents	Y		Y	N	31
19- Subsidence	Y		Y	N	32
20- Scrap Tire Fires	Y		Y	N	29
21- Hazardous Materials Accident - Fixed Site	Y		Y	N	6
22- Hazardous Materials Accident - Transportation	Y		Y	Y	1
23- Petroleum Pipeline Failures	Y		Y	N	16
24- Civil Disturbance	Y		Y	N	28

2013 HAZARD RISK ASSESSMENT – DELTA COUNTY					
25- Terrorism, Sabotage, WMD	Y		Y	N	20
26- Bioterrorism	Y		Y	N	21
27- Public Assembly Events			Y	N	13
28- School Violence	Y		Y	Y	7
29- Workplace Violence	Y		Y	N	8
30- Public Health Emergencies	Y		Y	N	10
31- Economic Recession/Adversity	N		Y	N	15
32- Transportation Accidents	Y		Y	Y	19

APPENDIX D

DELTA COUNTY
HIGH RISK EROSION PARCELS FOR:

Ensign Township

Ford River Township

Masonville Township

Wells Township

City of Gladstone

Ensign Township (arranged north to south)			
Sequence Number	Property Number	60-Year Projected Recession Distance	30-Year Projected Recession Distance
1	21-006-106-021-00	90 feet	45 feet
2	21-006-106-022-00	90 feet	45 feet
3	21-006-106-024-00	90 feet	45 feet
4	21-006-106-037-00	90 feet	45 feet
5	21-006-106-039-00	90 feet	45 feet
6	21-006-106-057-00	100 feet	55 feet
6.1	21-006-106-058-00	100 feet	55 feet
7	21-006-106-068-00	100 feet	55 feet
8	21-006-106-069-00	100 feet	55 feet
9	21-006-106-061-10	100 feet	55 feet
10	21-006-106-061-00	100 feet	55 feet
11	21-006-106-065-00	100 feet	55 feet
12	21-006-106-062-00	100 feet	55 feet
13	21-006-106-064-00	100 feet	55 feet
14	21-006-106-063-00	100 feet	55 feet
15	21-006-107-012-00	100 feet	55 feet
16	21-006-107-013-00	100 feet	55 feet
16.1	21-006-107-013-10	100 feet	55 feet

Ensign Township (arranged north to south)			
Sequence Number	Property Number	60-Year Projected Recession Distance	30-Year Projected Recession Distance
16.2	21-006-107-013-20	100 feet	55 feet
16.3	21-006-107-013-30	100 feet	55 feet
17	21-006-107-014-00	100 feet	55 feet
18	21-006-107-015-10	100 feet	55 feet
18.1	21-006-107-015-00	100 feet	55 feet
19	21-006-107-016-00	100 feet	55 feet
20	21-006-107-017-00	100 feet	55 feet
21	21-006-107-018-00	100 feet	55 feet
22	21-006-107-019-00	100 feet	55 feet
23	21-006-107-022-10	100 feet	55 feet
24	21-006-107-023-00	100 feet	55 feet
24.1	21-006-107-029-10	100 feet	55 feet
25	21-006-107-024-00	100 feet	55 feet
26	21-006-107-026-00	100 feet	55 feet
27	21-006-107-029-10	100 feet	55 feet
28	21-006-107-039-10	100 feet	55 feet
29	21-006-107-030-00	100 feet	55 feet
30	21-006-107-035-00	100 feet	55 feet

Ensign Township (arranged north to south)			
Sequence Number	Property Number	60-Year Projected Recession Distance	30-Year Projected Recession Distance
31	21-006-107-035-00	100 feet	55 feet
31.1	21-006-107-036-00	100 feet	55 feet
32	21-006-107-037-00	100 feet	55 feet
33	21-006-107-043-00	100 feet	55 feet
34	21-006-107-044-00	100 feet	55 feet
35	21-006-601-026-00	80 feet	40 feet
36	21-006-601-025-00	80 feet	40 feet
37	21-006-601-024-00	80 feet	40 feet
38	21-006-601-023-00	80 feet	40 feet
38.1	21-006-601-022-00	80 feet	40 feet
39	21-006-601-021-00	80 feet	40 feet
40	21-006-601-019-00	80 feet	40 feet
41	21-006-601-018-00	80 feet	40 feet
42	21-006-601-017-00	80 feet	40 feet
43	21-006-601-016-00	80 feet	40 feet
44	21-006-601-015-00	80 feet	40 feet
45	21-006-601-014-00	80 feet	40 feet
46	21-006-601-013-00	80 feet	40 feet
46.1	21-006-601-012-00	80 feet	40 feet

Ensign Township (arranged north to south)			
Sequence Number	Property Number	60-Year Projected Recession Distance	30-Year Projected Recession Distance
46.11	21-006-601-011-10	80 feet	40 feet
47	21-006-601-011-00	80 feet	40 feet
48	21-006-601-010-00	80 feet	40 feet
64	21-006-223-001-00 USDA-FS	60 feet	30 feet
65	21-006-223-002-00 USDA-FS	105 feet	60 feet

Ford River Township (arranged north to south)			
Sequence Number	Property Number	60-Year Project Recession Distance	30-Year Projected Recession Distance
1	21-009-062-015-00	70 feet	35 feet
2	21-009-062-014-00	70 feet	35 feet
2.1	21-009-062-016-00	70 feet	35 feet
3	21-009-062-050-00	70 feet	35 feet
3.1	21-009-061-050-00	70 feet	35 feet
3.9	21-009-063-003-00 MDOT	85 feet	40 feet
4	21-009-063-001-00	85 feet	40 feet
5	21-009-063-001-20	85 feet	40 feet

Ford River Township (arranged north to south)			
Sequence Number	Property Number	60-Year Project Recession Distance	30-Year Projected Recession Distance
6	21-009-063-001-10	85 feet	40 feet
7	21-009-302-043-00	95 feet	45 feet
8	21-009-302-042-00	95 feet	45 feet
9	21-009-302-041-00	95 feet	45 feet
9.1	21-009-302-040-00	95 feet	45 feet
10	21-009-302-039-00	95 feet	45 feet
10.1	21-009-302-038-00	95 feet	45 feet
11	21-009-302-037-00	95 feet	45 feet
12	21-009-302-036-00	170 feet	90 feet
13	21-009-302-035-00	170 feet	90 feet
13.1	21-009-302-033-00	170 feet	90 feet
13.1	21-009-302-034-00	170 feet	90 feet
14	21-009-302-032-50	170 feet	90 feet
15	21-009-072-001-00	170 feet	90 feet
16	21-009-072-003-20	170 feet	90 feet
17	21-009-072-002-00	170 feet	90 feet

Ford River Township (arranged north to south)			
Sequence Number	Property Number	60-Year Project Recession Distance	30-Year Projected Recession Distance
17.1	21-009-072-003-20	170 feet	90 feet
18	21-009-072-003-30	170 feet	90 feet
19	21-009-072-004-00	170 feet	90 feet
19.1	21-009-072-005-00 Ford River Mouth	170 feet	90 feet
20	21-009-303-002-00	190 feet	95 feet
21	21-009-303-003-00	190 feet	95 feet
22	21-009-303-003-60	190 feet	95 feet
22.1	21-009-303-003-80	105 feet	60 feet
23	21-009-303-003-20	105 feet	60 feet
24	21-009-303-004-00	105 feet	60 feet
25	21-009-303-005-00	105 feet	60 feet
26	21-009-303-006-00	105 feet	60 feet
27	21-009-303-007-00	105 feet	60 feet
27.1	21-009-071-030-00	105 feet	60 feet
27.12	21-009-071-031-10	105 feet	60 feet
27.13	21-009-071-031-20		

Ford River Township (arranged north to south)			
Sequence Number	Property Number	60-Year Project Recession Distance	30-Year Projected Recession Distance
		105 feet	60 feet
27.14	21-009-071-031-40	105 feet	60 feet
27.15	21-009-071-031-00	105 feet	60 feet
27.16	21-009-071-031-30	105 feet	60 feet
27.5	21-009-070-026-00	105 feet	60 feet
27.51	21-009-070-026-10	105 feet	60 feet
27.52	21-009-070-026-20	105 feet	60 feet
27.53	21-009-070-026-40	105 feet	60 feet
27.54	21-009-070-026-30	105 feet	60 feet
28	21-009-079-005-00	105 feet	60 feet
29	21-009-079-035-00	105 feet	60 feet
30	21-009-079-037-00	105 feet	60 feet
31	21-009-079-036-00	105 feet	60 feet
31.1	21-009-082-001-00	105 feet	60 feet

Masonville Township (arranged north to south)			
Sequence Number	Property Number	60-Year Projected Recession Distance	30-Year Projected Recession Distance
	21-012-182-032-00	105 feet	60 feet

Masonville Township (arranged north to south)			
Sequence Number	Property Number	60-Year Projected Recession Distance	30-Year Projected Recession Distance
1			
2	21-012-182-034-00	105 feet	60 feet
3	21-012-182-035-00	105 feet	60 feet
4	21-012-182-036-00	105 feet	60 feet
5	21-012-182-037-00	105 feet	60 feet
6	21-012-182-050-00	115 feet	65 feet
7	21-012-182-051-00	115 feet	65 feet
8	21-012-182-052-00	115 feet	65 feet
9	21-012-182-053-00	115 feet	65 feet
10	21-012-182-054-00	115 feet	65 feet
11	21-012-182-055-00	115 feet	65 feet
12	21-012-182-056-00	115 feet	65 feet
13	21-012-182-057-00	115 feet	65 feet
14	21-012-182-058-00	115 feet	65 feet
15	21-012-182-059-00	115 feet	65 feet
16	21-012-182-060-00	115 feet	65 feet

Masonville Township (arranged north to south)			
Sequence Number	Property Number	60-Year Projected Recession Distance	30-Year Projected Recession Distance
17	21-012-182-066-00	115 feet	65 feet
18	21-012-082-063-00	115 feet	65 feet
19	21-012-182-065-00	115 feet	65 feet

Wells Township (arranged north to south)			
Sequence Number	Property Number	60-Year Projected Recession Distance	30-Year Projected Recession Distance
1	21-014-641-002-00	80 feet	40 feet
2	21-014-641-003-00	80 feet	40 feet
3	21-014-007-011-00	80 feet	40 feet
4	21-014-720-001-00	80 feet	40 feet
5	21-014-720-002-00	80 feet	40 feet

City of Gladstone (arranged north to south)			
Sequence Number	Property Number	60-Year Projected Recession Distance	30-Year Projected Recession Distance
1	21-052-622-004-00 Water Plant	125 feet	70 feet
1	21-052-200-001-00 City	195 feet	105 feet

City of Gladstone (arranged north to south)			
Sequence Number	Property Number	60-Year Projected Recession Distance	30-Year Projected Recession Distance
1	21-052-200-001-00 City	315 feet	165 feet
1	21-052-200-001-00 City	160 feet	85 feet
2	21-052-150-062-00	85 feet	40 feet
3	21-052-150-063-00	85 feet	40 feet
4	21-052-150-009-00	85 feet	40 feet
5	21-052-150-008-00	85 feet	40 feet
6	21-052-150-005-00	85 feet	40 feet

Appendix E

Weather Events

from the
National Center for Environmental Information

Table 1
90 Hail Events in Delta County 1950 – 2020 (NCEI)

	Location or County	Date	Magnitude	Death	Injury	Property Damage	Crop Damage
1	Delta	07/17/81	2.00 in.	0	0	0	0
2	Delta	09/11/81	1.75 in.	0	0	0	0
3	Delta	07/19/84	0.75 in.	0	0	0	0
4	Delta	07/18/86	1.75 in.	0	0	0	0
5	Delta	07/18/86	0.75 in.	0	0	0	0
6	Delta	07/18/86	0.75 in.	0	0	0	0
7	Delta	06/06/87	0.88 in.	0	0	0	0
8	Delta	07/19/92	1.00 in.	0	0	0	0
9	Delta	07/19/92	1.00 in.	0	0	0	0
10	Escanaba	08/03/93	1.50 in.	0	0	0	0
11	Rock	07/14/95	1.75 in.	0	0	0	0
12	Rapid River	07/31/95	1.00 in.	0	0	0	0
13	Escanaba	07/08/96	1.00 in.	0	0	0	0
14	Escanaba	07/08/96	0.75 in.	0	0	0	0
15	Fairport	07/08/96	0.75 in.	0	0	0	0
16	Rapid River	07/08/96	1.50 in.	0	0	0	0
17	Gladstone	07/08/96	0.75 in.	0	0	0	0
18	Gladstone	07/08/96	0.75 in.	0	0	1K	0
19	Cornell	10/17/96	0.75 in.	0	0	0	0
20	Schaffer	07/02/97	1.50 in.	0	0	0	0
21	Escanaba	07/16/97	0.75 in.	0	0	0	0
22	Stonington	07/16/97	1.75 in.	0	0	0	0
23	Fayette	07/16/97	0.75 in.	0	0	0	0
24	Stonington	03/29/98	0.75 in.	0	0	0	0
25	Garden	07/30/99	0.75 in.	0	0	0	0
26	Gladstone	03/08/00	0.75 in.	0	0	0	0
27	Ford River	05/07/00	0.75 in.	0	0	0	0
28	Bark River	05/07/00	0.75 in.	0	0	0	0
29	Rapid River	06/27/01	0.88 in.	0	0	0	0
30	Gladstone	05/06/02	0.75 in.	0	0	0	0
31	Gladstone	05/06/02	1.25 in.	0	0	0	0
32	Garden	05/06/02	0.88 in.	0	0	0	0
33	Rock	05/30/02	0.88 in.	0	0	0	0
34	Escanaba	05/30/02	0.75 in.	0	0	0	0
35	Escanaba	05/30/02	1.25 in.	0	0	0	0
36	Rapid River	05/30/02	0.75 in.	0	0	0	0
37	Rock	06/26/02	1.00 in.	0	0	0	0
38	Cornell	07/30/02	0.75 in.	0	0	0	0
39	Garden	07/30/02	1.75 in.	0	0	0	0
40	Escanaba	08/01/02	1.75 in.	0	0	0	0
41	Bark river	08/01/02	0.88 in.	0	0	0	0
42	Bark River	07/30/03	0.75 in.	0	0	0	0
43	Bark River	07/30/03	0.75 in.	0	0	0	0
44	Gladstone	08/25/03	1.75 in.	0	0	0	0
45	Garden Corners	04/18/2004	0.88 in.	0	0	0	0
46	Rapid River	06/14/2004	0.88 in.	0	0	0	0
47	Rapid River	06/14/2004	0.88 in.	0	0	0	0

Table 1 90 Hail Events in Delta County 1950 – 2020 (NCEI)							
	Location or County	**Date**	**Magnitude**	**Death**	**Injury**	**Property Damage**	**Crop Damage**
48	Ford River	07/13/2004	1.00 in.	0	0	0	0
49	Rapid River	08/02/2004	1.00 in.	0	0	0	0
50	Nahma	08/02/2004	0.75 in.	0	0	0	0
51	Rock	08/09/2004	0.88 in.	0	0	0	0
52	Hyde	06/18/2006	1.00 in.	0	0	0	0
53	Lathrop	07/03/2006	1.75 in.	0	0	0	0
54	Garden	06/07/2007	0.88 in.	0	0	2K	0
55	Schaffer	06/20/2007	0.75 in.	0	0	0	0
56	Ford River	07/07/2007	0.75 in.	0	0	0	0
57	Stonington	07/08/2007	0.88 in.	0	0	0	0
58	Moss Lake	07/08/2007	0.88 in.	0	0	0	0
59	Gladstone	07/08/2007	0.88 in.	0	0	0	0
60	Rapid River	07/08/2007	1.75 in.	0	0	0	0
61	Rapid River	07/08/2007	1.00 in.	0	0	0	0
62	Gladstone	07/08/2007	1.00 in.	0	0	0	0
63	Escanaba	07/08/2007	0.75 in.	0	0	0	0
64	Escanaba	07/08/2007	0.88 in.	0	0	0	0
65	Gladstone	07/08/2007	0.88 in.	0	0	0	0
66	Bark River	05/25/2008	2.50 in.	0	0	0	0
67	Garden	07/15/2008	1.00 in.	0	0	0	0
68	Larch	08/01/2008	0.88 in.	0	0	0	0
69	Stonington	08/01/2008	1.75 in.	0	0	0	0
70	Maplewood	07/25/2011	1.75 in.	0	0	1K	0
71	Flat Rock	06/18/2012	1.75 in.	0	0	0	0
72	Gladstone	06/18/2012	2.00 in.	0	0	0	0
73	Chandler	07/30/2012	0.88 in.	0	0	0	0
74	Chandler	07/30/2012	0.88 in.	0	0	0	0
75	Gladstone	07/30/2012	1.00 in.	0	0	0	0
76	Perkins	08/02/2015	1.00 in.	0	0	0	0
77	Kipling	08/02/2015	1.50 in.	0	0	15K	0
78	Kipling	08/02/2015	1.50 in.	0	0	0	0
79	Osier	08/14/2015	1.75 in.	0	0	0	0
80	Fayette	08/17/2015	1.75 in.	0	0	0	0
81	Bark River	06/01/2016	0.88 in.	0	0	0	0
82	Gladstone	06/01/2016	0.75 in.	0	0	0	0
83	Escanaba	05/17/2017	0.88 in.	0	0	0	0
84	Perkins	06/17/2017	1.75 in.	0	0	0	0
85	Perkins	08/01/2017	1.00 in.	0	0	0	0
86	Campbell	05/04/2018	0.88 in.	0	0	0	0
87	Gladstone	06/16/2018	0.75 in.	0	0	0	0
88	Gladstone	05/22/2019	1.00 in.	0	0	0	0
89	Moss Lake	05/22/2019	1.00 in.	0	0	0	0
90	Bark River	08/21/2020	1.00 in.	0	0	0	0
Total				**0**	**0**	**19K**	**0**

Table 2 18 Tornado Events in Delta County 1950 – 2020 (NCEI)							
	Location or County	**Date**	**Magnitude**	**Death**	**Injury**	**Property Damage**	**Crop Damage**
1	Delta	08/16/68	F1	0	0	25K	0
2	Delta	07/20/72	F2	0	1	250K	0
3	Delta	07/27/73	F0	0	0	0K	0
4	Delta	07/14/74	F1	0	0	25K	0
5	Delta	07/11/87	F3	0	0	25K	0
6	Delta	07/19/92	F2	0	2	2.5M	0
7	Garden Corners	10/05/97	F1	0	0	3K	0
8	Rock	03/29/98	N/A	0	0	0	0
9	Escanaba	06/25/98	N/A	0	0	0	0
10	Escanaba	06/25/98	N/A	0	0	0	0
11	Escanaba	06/25/98	F1	0	0	25K	0
12	Rapid River	05/30/02	F0	0	0	0	0
13	Schaffer	08/28/07	N/A	0	0	0	0
14	Masonville	07/25/08	EF0	0	0	10K	0
15	Wells	08/01/08	N/A	0	0	0	0
16	Garden	07/19/13	N/A	0	0	0	0
17	Bark River	07/25/13	N/A	0	0	0	0
18	Pine Ridge	08/31/20	EF1	0	0	150K	0
Total				**0**	**3**	**3.013M**	**0**

Table 3 106 Thunderstorm & High Wind Events in Delta County 1950 – 2020 (NCEI)							
	Location or County	**Date**	**Magnitude**	**Death**	**Injury**	**Property Damage**	**Crop Damage**
1	Delta	07/02/57	0 kts.	0	0	0	0
2	Delta	09/08/60	53 kts.	0	0	0	0
3	Delta	07/01/63	50 kts.	0	0	0	0
4	Delta	07/06/63	0 kts.	0	0	0	0
5	Delta	08/01/64	0 kts.	0	0	0	0
6	Delta	08/07/69	0 kts.	0	0	0	0
7	Delta	07/14/74	85 kts.	0	0	0	0
8	Delta	05/19/75	0 kts.	0	0	0	0
9	Delta	07/19/75	0 kts.	0	0	0	0
10	Delta	07/07/80	0 kts.	0	0	0	0
11	Delta	07/06/82	54 kts.	0	0	0	0
12	Delta	06/26/83	0 kts.	0	0	0	0
13	Delta	09/06/83	60 kts.	0	0	0	0
14	Delta	09/06/83	0 kts.	0	0	0	0
15	Delta	06/26/84	0 kts.	0	0	0	0
16	Delta	07/14/84	0 kts.	0	0	0	0
17	Delta	07/24/86	0 kts.	0	0	0	0
18	Delta	07/11/87	0 kts.	0	0	0	0
19	Delta	07/20/87	0 kts.	0	0	0	0
20	Delta	07/20/87	0 kts.	0	0	0	0
21	Delta	06/17/92	0 kts.	0	0	0	0

Table 3
106 Thunderstorm & High Wind Events in Delta County 1950 – 2020 (NCEI)

	Location or County	Date	Magnitude	Death	Injury	Property Damage	Crop Damage
22	Lower	05/24/93	0 kts.	0	0	50K	0
23	Maple Hill	07/13/95	N/A	0	0	0	0
24	Gladstone	07/13/95	N/A	0	0	0	0
25	Rapid River	07/14/95	N/A	0	0	0	0
26	Cornell	07/08/96	55 kts.	0	0	2K	0
27	Rock	10/05/97	100 kts.	0	0	300K	2.3M
28	Cornell	05/17/98	60 kts.	0	0	400K	0
29	Rapid River	05/17/98	50 kts.	0	0	0	0
30	Escanaba	06/25/98	55 kts.	0	0	75K	0
31	Delta & other counties	11/10/98	76 kts.	0	0	450K	10.0M
32	Nahma	06/06/99	55 kts.	0	0	0	0
33	Cornell	07/05/99	52 kts.	0	0	0	0
34	Bark River	07/29/99	75 kts.	0	0	0	0
35	Rapid River	07/29/99	55 kts.	0	0	0	0
36	Cornell	07/30/99	55 kts.	0	0	0	0
37	Gladstone	07/30/99	60 kts.	0	0	0	0
38	Escanaba	09/11/00	55 kts.	0	0	0	0
39	Rapid River	07/21/01	55 kts.	0	0	0	0
40	Isabella	07/21/01	60 kts.	0	0	0	0
41	Rapid River	07/21/02	55 kts.	0	0	0	0
42	Rock	07/21/02	55 kts.	0	0	0	0
43	Cornell	07/31/02	60 kts.	0	0	0	0
44	Gladstone	07/31/02	60 kts.	0	0	0	0
45	Rock	07/31/02	60 kts.	0	0	0	0
46	Isabella	08/01/02	65 kts.	0	0	0	0
47	Nahma	08/01/02	65 kts.	0	0	0	0
48	Cornell	10/04/02	60 kts.	0	0	0	0
49	Ensign	10/04/02	60 kts.	0	0	0	0
50	Escanaba	10/04/02	60 kts.	0	0	0	0
51	Bark River	08/26/03	57 kts.	0	0	0	0
52	Garden	08/26/03	65 kts.	0	0	0	0
53	Bark River	06/13/04	55 kts.	0	0	0	0
54	Rapid River	06/14/04	65 kts.	0	0	0	0
55	Ensign	08/02/04	55 kts.	0	0	0	0
56	Gladstone	08/09/04	65 kts.	0	0	0	0
57	Gladstone	08/09/04	60 kts.	0	0	0	0
58	Escanaba	08/04/05	55 kts.	0	0	0	0
59	Perkins	08/09/05	70 kts.	0	0	0	0
60	Escanaba	08/09/05	65 kts.	0	0	0	0
61	Stonington	08/09/05	70 kts.	0	0	0	0
62	Garden	07/28/06	55 kts.	0	0	3K	0
63	Rapid River	07/30/06	55 kts.	0	0	0	0
64	Escanaba	03/26/07	50 kts.	0	0	1K	0
65	Escanaba	08/28/07	50 kts.	0	0	4K	0
66	Island View	07/17/08	65 kts.	0	0	10K	0
67	Island View	07/17/08	78 kts.	0	0	20K	0

Table 3 106 Thunderstorm & High Wind Events in Delta County 1950 – 2020 (NCEI)							
	Location or County	**Date**	**Magnitude**	**Death**	**Injury**	**Property Damage**	**Crop Damage**
68	Gladstone	07/25/08	43 kts.	0	0	0.10K	0
69	Kipling	07/25/08	43 kts.	0	0	0.10K	0
70	Garden Corners	07/25/08	55 kts.	0	0	1K	0
10	Cornell	08/01/08	50 kts.	0	0	0	0
72	Cornell	08/01/08	50 kts.	0	0	0	0
73	Larch	08/01/08	55 kts.	0	0	0	0
74	Escanaba	08/01/08	50 kts.	0	0	0	0
75	Pine Ridge	08/01/08	50 kts.	0	0	0	0
76	Moss Lake	06/08/11	50 kts.	0	0	0	0
77	Moss Lake	06/08/11	50 kts.	0	0	0	0
78	Moss Lake	06/08/11	50 kts.	0	0	0	0
79	Escanaba	07/30/11	57 kts.	0	0	3K	0
80	Rapid River	07/30/11	52 kts.	0	0	1K	0
81	Moss Lake	07/30/11	55 kts.	0	0	3K	0
82	Schaffer	05/28/12	50 kts.	0	0	1K	0
83	Cornell	09/03/12	55 kts.	0	0	1K	0
84	Beaver	09/03/12	60 kts.	0	0	2K	0
85	Perkins	09/03/12	55 kts.	0	0	1K	0
86	Perkins	09/03/12	60 kts.	0	0	5K	0
87	Escanaba	07/19/13	55 kts.	0	0	20K	0
88	Gladstone	07/26/14	50 kts.	0	0	0.5K	0
89	Rock	07/25/15	70 kts.	0	0	100K	0
90	Cornell	06/11/17	61 kts.	0	0	4K	0
91	Kipling	06/11/17	61 kts.	0	0	8K	0
92	Fayette	06/11/17	56 kts.	0	0	.5K	0
93	Moss Lake	06/11/17	56 kts.	0	0	2K	0
94	Moss Lake	06/11/17	52 kts.	0	0	1K	0
95	Bark River	06/11/17	52 kts.	0	0	1K	0
96	Campbell	07/18/17	55 kts.	0	0	3K	0
97	Delta Co. Airport	07/01/19	50 kts.	0	0	1K	0
98	Brampton	08/01/18	55 kts.	0	0	1K	0
99	Gladstone	08/05/19	60 kts.	0	0	3K	0
100	Gladstone	08/05/19	55 kts.	0	0	2K	0
101	Gladstone	08/05/19	60 kts.	0	0	15K	0
102	Flat Rock	07/06/20	50 kts.	0	0	2K	0
103	Escanaba	07/06/20	50 kts.	0	0	1K	0
104	Rapid River	07/19/20	50 kts.	0	0	1K	0
105	Bark River	07/19/20	50 kts.	0	0	1K	0
106	Stonington	07/19/20	50 kts.	0	0	1K	0
Total				**0**	**2**	**1.501M**	**12.250M**

Table 4 5 Temperature Extreme Events 1950 – 2020 (NCEI)							
	Location or County	**Date**	**Magnitude**	**Death**	**Injury**	**Property Damage**	**Crop Damage**
1	Delta & other counties	2/03/96	N/A	0	0	0	0
2	Delta & other counties	2/04/96	N/A	0	0	0	0
3	Delta & other counties	02/04/07	N/A	0	0	0	0
4	Delta & other counties	01/05/14	N/A	0	0	0	0
5	Delta & other counties	01/27/14	N/A	0	0	0	0
Total				**0**	**0**	**0**	**0**

Table 5 14 Flood Events 1950 – 2020 (NCEI)							
	Location or County	**Date**	**Type**	**Death**	**Injury**	**Property Damage**	**Crop Damage**
1	Southern Lower Michigan	01/03/93	Flooding	0	0	5K	0
2	Delta & other counties	03/23/93	Flood	0	0	0	0
3	Delta & other counties	04/19/93	Flood	0	0	5.0M	0
4	Delta & other counties	04/20/96	Flood	0	0	800K	0
5	Gladstone	07/08/96	Urban/small stream fld.	0	0	0	0
6	Escanaba	08/01/02	Flash flood	0	0	0	0
7	Delta & other counties	04/02/05	Flood	0	0	0	0
8	Escanaba	05/28/06	Flash flood	0	0	0	0
9	Escanaba	07/08/07	Flash flood	0	0	0	0
10	Escanaba	07/08/07	Flash flood	0	0	0	0
11	Escanaba	07/08/07	Flash flood	0	0	0	0
12	Cornell	06/23/10	Flash flood	0	0	5K	0
13	Chandler	04/11/14	Flood	0	0	85K	0
14	Delta Co. Airport	04/20/19	Flood	0	0	0	0
Total				**0**	**0**	**5.895M**	**0**

Table 6 91 Snow & Ice Events in Delta County 1950 – 2020 (NCEI)							
	Location or County	**Date**	**Type**	**Death**	**Injury**	**Property Damage**	**Crop Damage**
1	Delta & other counties	01/12/93	Heavy Snow	0	0	50K	0
2	Delta & other counties	02/22/93	Lake effect Snow	0	0	0	0
3	Southern	03/10/93	Heavy Snow	0	0	0	0
4	Delta & other counties	03/23/93	Freezing Rain	0	0	0	0
5	Upper Michigan	11/04/93	Heavy Snow	0	0	0	0
6	Upper Michigan & Wisconsin	12/20/93	Heavy Snow	0	0	0	0
7	Part of Upper & All	01/27/94	Heavy Snow/freezing Rain	0	0	5.0M	0
8	Delta & other counties	03/04/95	Heavy Snow	0	0	0	0
9	Delta & other counties	03/06/95	Heavy Snow	0	0	0	0
10	West & Central Upper	12/13/95	Heavy Snow	0	0	0	0
11	Delta & other counties	01/18/96	Winter Storm	0	0	0	0
12	Delta & other counties	01/26/96	Heavy Snow	0	0	0	0
13	Delta & other counties	04/12/96	Winter Storm	0	0	0	0
14	Delta & other counties	03/13/97	Winter Storm	0	0	0	0
15	Delta & other counties	01/04/98	Ice Storm	0	0	0	0
16	Delta & other counties	01/02/99	Winter Storm	0	0	0	0
17	Delta & other counties	01/02/00	Heavy Snow	0	0	0	0
18	Delta & other counties	02/15/00	Winter Storm	0	0	0	0
19	Delta & other counties	02/08/01	Winter Storm	0	0	0	0
20	Delta & other counties	03/03/02	Winter Storm	0	0	0	0
21	Delta & other counties	03/08/02	Winter Storm	0	0	0	0
22	Delta & other counties	03/09/02	Ice Storm	0	0	0	0
23	Delta & other counties	04/28/02	Heavy Snow	1	0	0	0
24	Delta & other counties	12/18/02	Ice Storm	0	0	0	0
25	Delta & other	02/03/03	Heavy Snow	0	0	0	0

Table 6 91 Snow & Ice Events in Delta County 1950 – 2020 (NCEI)							
	Location or County	**Date**	**Type**	**Death**	**Injury**	**Property Damage**	**Crop Damage**
	counties						
26	Delta & other counties	03/03/03	Winter Storm	0	0	0	0
27	Delta & other counties	04/05/03	Heavy Snow	0	0	0	0
28	Delta & other counties	12/10/03	Heavy Snow	0	0	0	0
29	Delta & other counties	12/11/03	Heavy Snow	0	0	0	0
30	Delta & other counties	01/07/04	Winter Storm	0	0	0	0
31	Delta & other counties	03/05/04	Heavy Snow	0	0	0	0
32	Delta & other counties	03/13/04	Heavy Snow	0	0	0	0
33	Delta & other counties	12/12/04	Winter Storm	0	0	0	0
34	Delta & other counties	12/20/04	Winter Storm	0	0	0	0
35	Delta & other counties	12/25/2004	Heavy Snow	0	0	0	0
36	Delta & other counties	01/02/05	Ice Storm	0	0	0	0
37	Delta & other counties	01/21/05	Heavy Snow	0	0	0	0
38	Delta & other counties	11/23/05	Winter Storm	0	0	0	0
39	Delta & other counties	12/01/05	Lake-Effect Snow	0	0	0	0
40	Delta & other counties	12/14/2005	Winter Storm	0	0	0	0
41	Delta & other counties	02/03/06	Heavy Snow	0	0	0	0
42	Delta & other counties	02/16/06	Winter Storm	0	0	0	0
43	Delta & other counties	02/24/06	Heavy Snow	0	0	0	0
44	Delta & other counties	01/29/06	Lake-Effect Snow	0	0	0	0
45	Delta & other counties	02/25/07	Winter Storm	0	0	0	0
46	Delta & other counties	03/01/07	Winter Storm	0	0	0	0
47	Delta & other counties	04/04/07	Winter Storm	0	0	0	0
48	Delta & other counties	12/01/07	Winter Storm	0	0	0	0
49	Delta & other	01/17/08	Heavy Snow	0	0	0	0

Table 6 91 Snow & Ice Events in Delta County 1950 – 2020 (NCEI)							
	Location or County	**Date**	**Type**	**Death**	**Injury**	**Property Damage**	**Crop Damage**
	counties						
50	Delta & other counties	01/30/08	Winter Storm	0	0	0	0
51	Delta & other counties	02/14/08	Heavy Snow	0	0	0	0
52	Delta & other counties	02/17/08	Winter Storm	0	0	0	0
53	Delta & other counties	03/31/08	Winter Storm	0	0	0	0
54	Delta & other counties	04/01/08	Winter Storm	0	0	0	0
55	Delta & other counties	04/08/08	Heavy Snow	0	0	0	0
56	Delta & other counties	04/11/08	Winter Storm	0	0	0	0
57	Delta & other counties	11/19/08	Lake-Effect Snow	0	0	0	0
58	Delta & other counties	12/06/08	Winter Storm	0	0	0	0
59	Delta & other counties	12/20/08	Heavy Snow	0	0	0	0
60	Delta & other counties	02/17/09	Winter Storm	0	0	0	0
61	Delta & other counties	02/26/09	Winter Storm	0	0	0	0
62	Delta & other counties	12/08/09	Winter Storm	0	0	0	0
63	Delta & other counties	12/11/10	Winter Storm	0	0	0	0
64	Delta & other counties	02/29/12	Winter Storm	0	0	0	0
65	Delta & other counties	03/02/12	Winter Storm	0	0	15K	0
66	Delta & other counties	12/20/12	Winter Storm	0	0	0	0
67	Delta & other counties	01/30/13	Winter Storm	0	0	0	0
68	Delta & other counties	04/11/13	Winter Storm	0	0	0	0
69	Delta & other counties	11/28/13	Lake-Effect Snow	0	0	0	0
70	Delta & other counties	12/03/13	Winter Storm	0	0	0	0
71	Delta & other counties	12/14/13	Lake-Effect Snow	0	0	0	0
72	Delta & other counties	01/30/14	Winter Storm	0	0	0	0
73	Delta & other	03/27/14	Winter Storm	0	0	0	0

Table 6 91 Snow & Ice Events in Delta County 1950 – 2020 (NCEI)							
	Location or County	**Date**	**Type**	**Death**	**Injury**	**Property Damage**	**Crop Damage**
	counties						
74	Delta & other counties	02/14/15	Blizzard	0	0	0	0
75	Delta & other counties	12/28/15	Winter Storm	0	0	0	0
76	Delta & other counties	01/10/17	Winter Storm	0	0	0	0
77	Delta & other counties	12/11/17	Lake-Effect Snow	0	0	0	0
78	Delta & other counties	01/14/18	Winter Storm	0	0	0	0
79	Delta & other counties	01/22/18	Winter Storm	0	0	0	0
80	Delta & other counties	03/30/18	Winter Storm	0	0	0	0
81	Delta & other counties	04/15/18	Winter Storm	0	0	0	0
82	Delta & other counties	01/07/19	Winter Storm	0	0	0	0
83	Delta & other counties	02/04/19	Ice Storm	0	0	0	0
84	Delta & other counties	02/05/19	Winter Storm	0	0	0	0
85	Delta & other counties	02/12/19	Winter Storm	0	0	0	0
86	Delta & other counties	02/20/19	Winter Storm	0	0	0	0
87	Delta & other counties	12/01/19	Winter Storm	0	0	1K	0
88	Delta & other counties	12/12/19	Winter Storm	0	0	0	0
89	Delta & other counties	12/30/19	Winter Storm	0	0	0	0
90	Delta & other counties	1/17/20	Winter Storm	0	0	0	0
91	Delta & other counties	04/12/20	Winter Storm	0	0	0	0
			TOTALS	**0**	**0**	**5.126M**	**0**

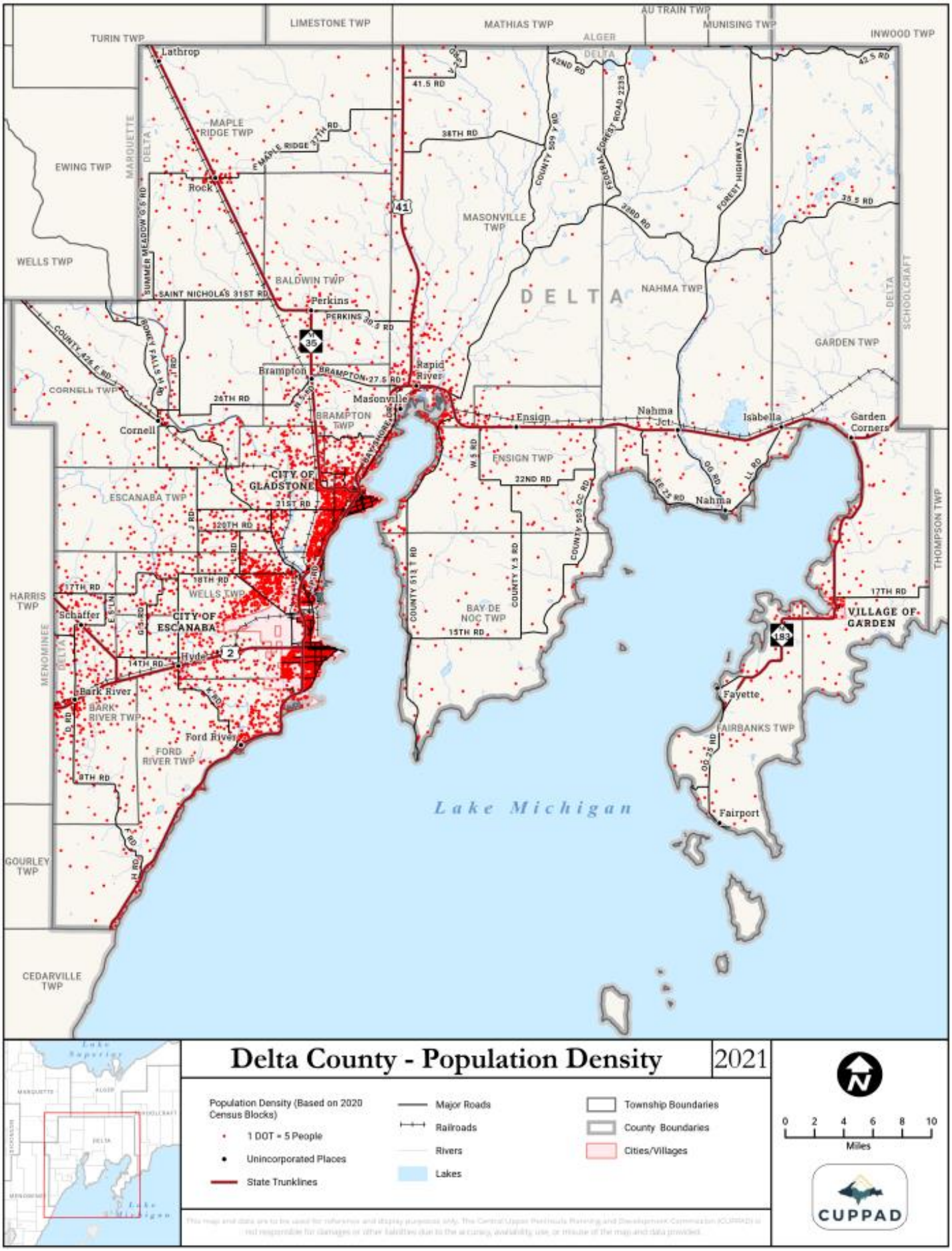
Appendix F

Delta County Maps

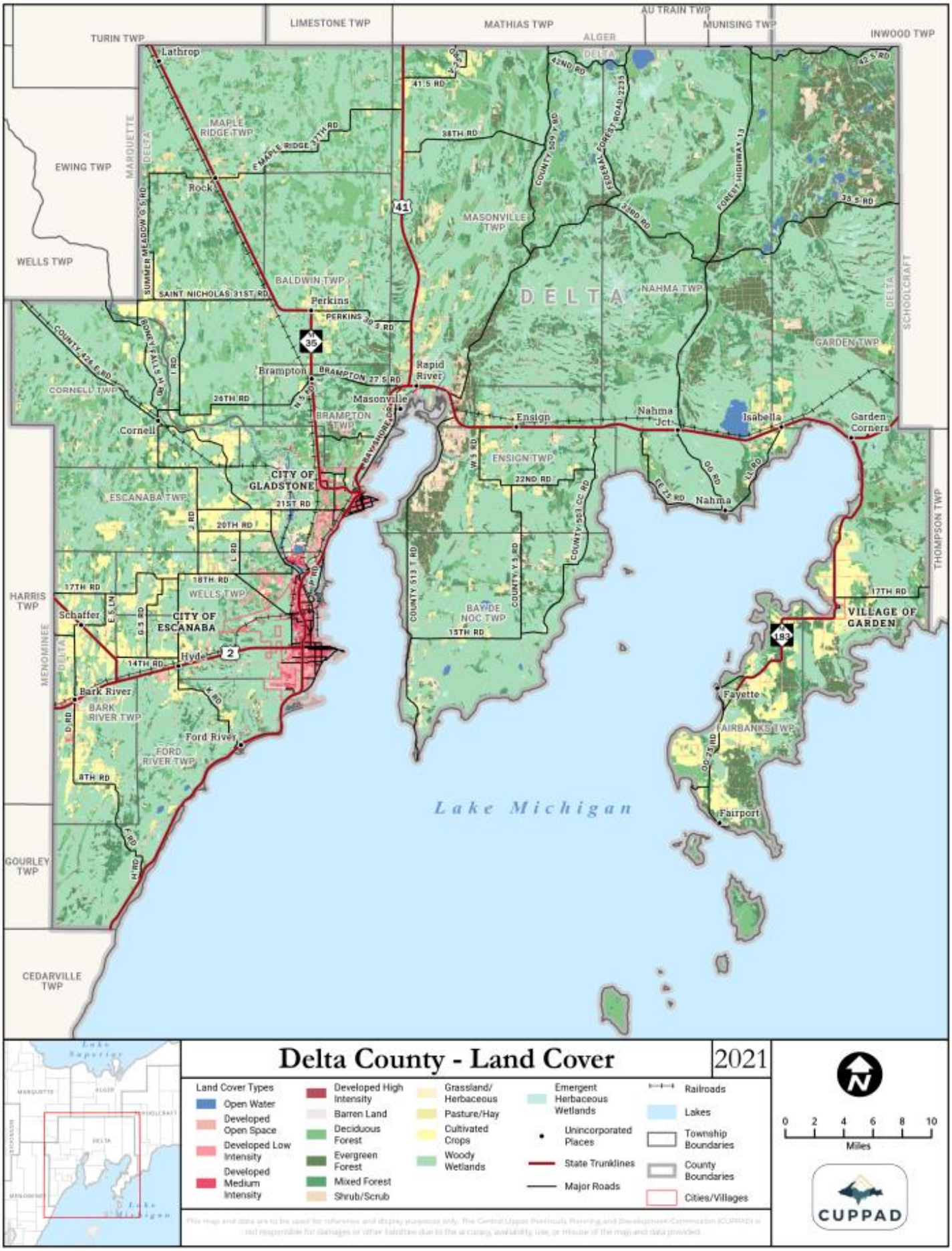
Map 1


TURIN TWP
LIMESTONE TWP
MATHIAS TWP
AU TRAIN TWP
MUNISING TWP
INWOOD TWP
ALGER
DELTA
Lathrop
MAPLE RIDGE TWP
EWING TWP
Rock
MARQUETTE
DELTA
WELLS TWP
BALDWIN TWP
MASONVILLE TWP
NAHMA TWP
DELTA
SCHOOLCRAFT
GARDEN TWP
Perkins
SAINT NICHOLAS 31ST RD
PERKINS 30.5 RD
Rapid River
Brampton
Masonville
BRAMPTON TWP
CORNELL TWP
Cornell
26TH RD
BRAMPTON 27.5 RD
Ensign
Nahma Jct
Isabella
Garden Corners
ENSIGN TWP
22ND RD
Nahma
ESCANABA TWP
CITY OF GLADSTONE
21ST RD
20TH RD
18TH RD
17TH RD
WELLS TWP
HARRIS TWP
Schaffer
CITY OF ESCANABA
Hyde
14TH RD
MENOMINEE
DELTA
Bark River
Ford River
FORD RIVER TWP
8TH RD
BARK RIVER TWP
BAY DE NOC TWP
15TH RD
THOMPSON TWP
VILLAGE OF GARDEN
Fayette
FAIRBANKS TWP
Fairport
Lake Michigan
GOURLEY TWP
CEDARVILLE TWP
Delta County - Basemap
2021
Unincorporated Places
State Trunklines
Major Roads
Railroads
Rivers
Lakes
Township Boundaries
County Boundaries
Cities/Villages
0 2 4 6 8 10
Miles
CUPPAD

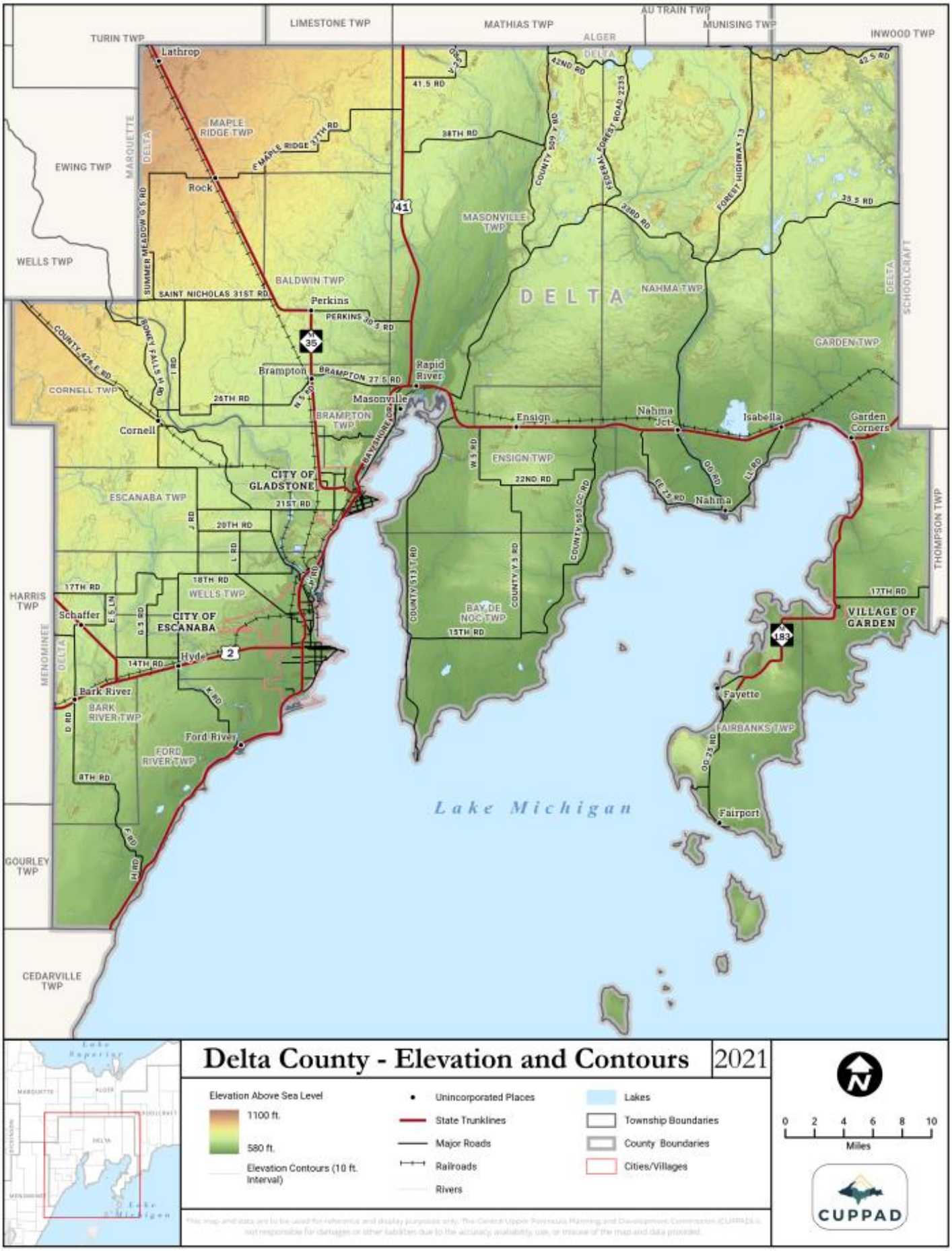
Map 2


Delta County - Population Density
2021
Population Density (Based on 2020 Census Blocks)
1 DOT = 5 People
Unincorporated Places
State Trunklines
Major Roads
Railroads
Rivers
Lakes
Township Boundaries
County Boundaries
Cities/Villages
0 2 4 6 8 10
Miles
CUPPAD
Lake Michigan
TURIN TWP
LIMESTONE TWP
MATHIAS TWP
AU TRAIN TWP
MUNISING TWP
INWOOD TWP
ALGER
DELTA
MAPLE RIDGE TWP
EWING TWP
WELLS TWP
BALDWIN TWP
MASONVILLE TWP
NAHMA TWP
GARDEN TWP
BRAMPTON TWP
ENSIGN TWP
CORNELL TWP
ESCANABA TWP
CITY OF GLADSTONE
CITY OF ESCANABA
WELLS TWP
BAY DE NOC TWP
FAIRBANKS TWP
BARK RIVER TWP
FORD RIVER TWP
HARRIS TWP
GOURLEY TWP
CEDARVILLE TWP
THOMPSON TWP
VILLAGE OF GARDEN
Lathrop
Rock
Perkins
Brampton
Rapid River
Masonville
Ensign
Nahma Jct
Nahma
Isabella
Garden Corners
Cornell
Schaffer
Hyde
Bark River
Ford River
Fayette
Fairport
MARQUETTE
MENOMINEE
SCHOOLCRAFT
41
35
183
2

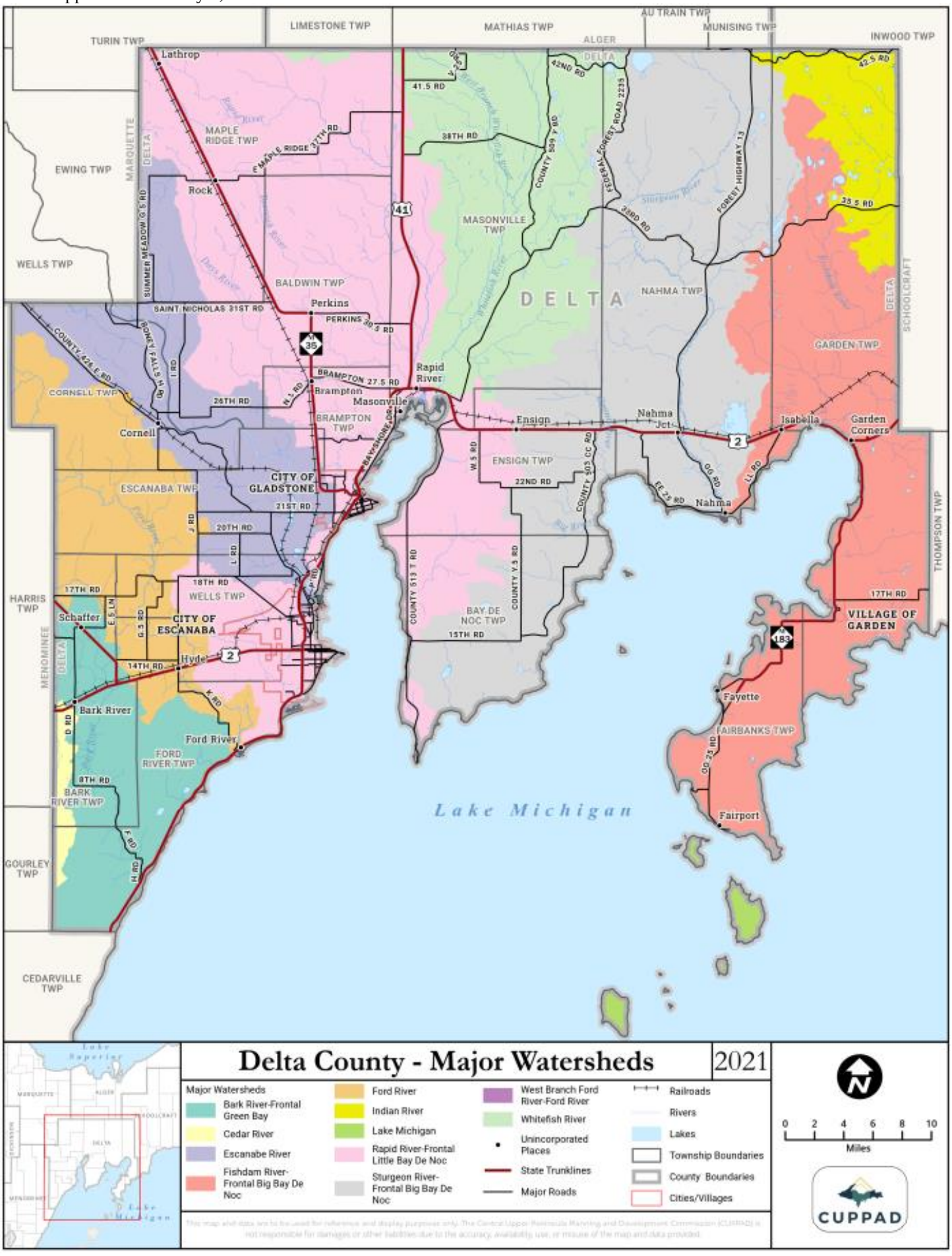
Map 3


TURIN TWP
LIMESTONE TWP
MATHIAS TWP
AU TRAIN TWP
MUNISING TWP
INWOOD TWP
ALGER
Lathrop
MAPLE RIDGE TWP
EWING TWP
MARQUETTE
DELTA
Rock
WELLS TWP
BALDWIN TWP
SAINT NICHOLAS 31ST RD
Perkins
PERKINS 30 S RD
MASONVILLE TWP
DELTA
NAHMA TWP
SCHOOLCRAFT
GARDEN TWP
Brampton
BRAMPTON 27 S RD
Rapid River
CORNELL TWP
Cornell
26TH RD
Masonville
BRAMPTON TWP
Ensign
Nahma Jct
Isabella
Garden Corners
ENSIGN TWP
CITY OF GLADSTONE
ESCANABA TWP
21ST RD
22ND RD
Nahma
20TH RD
THOMPSON TWP
HARRIS TWP
17TH RD
18TH RD
WELLS TWP
Schaffer
CITY OF ESCANABA
BAYDE NOC TWP
15TH RD
VILLAGE OF GARDEN
Hyde
14TH RD
MENOMINEE
Bark River
BARK RIVER TWP
Fayette
FAIRBANKS TWP
Ford River
FORD RIVER TWP
8TH RD
Lake Michigan
Fairport
GOURLEY TWP
CEDARVILLE TWP
Delta County - Land Cover
2021
Land Cover Types
Open Water
Developed Open Space
Developed Low Intensity
Developed Medium Intensity
Developed High Intensity
Barren Land
Deciduous Forest
Evergreen Forest
Mixed Forest
Shrub/Scrub
Grassland/ Herbaceous
Pasture/Hay
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands
Unincorporated Places
State Trunklines
Major Roads
Railroads
Lakes
Township Boundaries
County Boundaries
Cities/Villages
0 2 4 6 8 10
Miles
CUPPAD

Map 4


TURIN TWP
LIMESTONE TWP
MATHIAS TWP
ALGER
AU TRAIN TWP
MUNISING TWP
INWOOD TWP
Lathrop
MAPLE RIDGE TWP
EWING TWP
WELLS TWP
BALDWIN TWP
Rock
Perkins
MASONVILLE TWP
DELTA
NAHMA TWP
GARDEN TWP
SCHOOLCRAFT
Brampton
Rapid River
Masonville
CORNELL TWP
Cornell
BRAMPTON TWP
Ensign
Nahma Jct.
Isabella
Garden Corners
ENSIGN TWP
Nahma
CITY OF GLADSTONE
ESCANABA TWP
THOMPSON TWP
HARRIS TWP
WELLS TWP
Schaffer
CITY OF ESCANABA
Hyde
BAY DE NOC TWP
VILLAGE OF GARDEN
Bark River
BARK RIVER TWP
Fayette
FAIRBANKS TWP
Ford River
FORD RIVER TWP
Fairport
Lake Michigan
GOURLEY TWP
CEDARVILLE TWP
MENOMINEE
MARQUETTE
Delta County - Elevation and Contours
2021
Elevation Above Sea Level
1100 ft.
580 ft.
Elevation Contours (10 ft. Interval)
Unincorporated Places
State Trunklines
Major Roads
Railroads
Rivers
Lakes
Township Boundaries
County Boundaries
Cities/Villages
0 2 4 6 8 10
Miles
CUPPAD

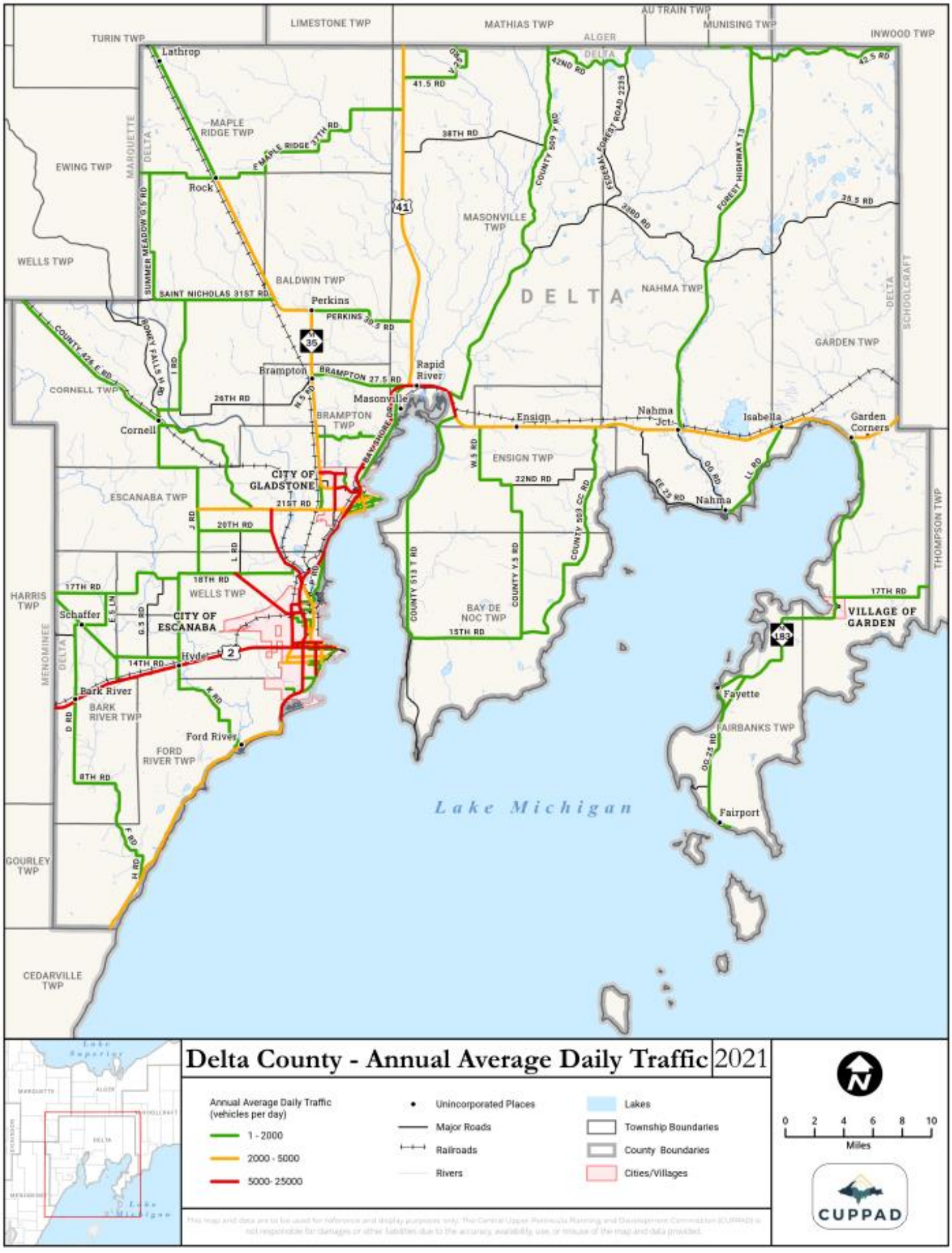
Map 5


TURIN TWP
LIMESTONE TWP
MATHIAS TWP
AU TRAIN TWP
MUNISING TWP
INWOOD TWP
ALGER
DELTA
Lathrop
MAPLE RIDGE TWP
EWING TWP
MARQUETTE
Rock
WELLS TWP
BALDWIN TWP
Perkins
MASONVILLE TWP
NAHMA TWP
GARDEN TWP
SCHOOLCRAFT
CORNELL TWP
Cornell
Brampton
Masonville
Rapid River
BRAMPTON TWP
Ensign
Nahma Jct
Isabella
Garden Corners
ESCANABA TWP
CITY OF GLADSTONE
ENSIGN TWP
Nahma
THOMPSON TWP
HARRIS TWP
MENOMINEE
Schaffer
CITY OF ESCANABA
WELLS TWP
Hyde
BAY DE NOC TWP
VILLAGE OF GARDEN
Bark River
Ford River
FORD RIVER TWP
BARK RIVER TWP
Fayette
FAIRBANKS TWP
Fairport
Lake Michigan
GOURLEY TWP
CEDARVILLE TWP
41
35
2
183
41.5 RD
38TH RD
42ND RD
42.5 RD
35.5 RD
28TH RD
SAINT NICHOLAS 31ST RD
PERKINS 30.5 RD
BRAMPTON 27.5 RD
26TH RD
22ND RD
21ST RD
20TH RD
18TH RD
17TH RD
15TH RD
14TH RD
8TH RD
COUNTY 509 Y RD
FEDERAL FOREST ROAD 2235
FOREST HIGHWAY 13
COUNTY 426 E RD
COUNTY 505 CC RD
COUNTY 513 T RD
COUNTY Y.5 RD
Delta County - Major Watersheds
2021
Major Watersheds
Bark River-Frontal Green Bay
Cedar River
Escanabe River
Fishdam River-Frontal Big Bay De Noc
Ford River
Indian River
Lake Michigan
Rapid River-Frontal Little Bay De Noc
Sturgeon River-Frontal Big Bay De Noc
West Branch Ford River-Ford River
Whitefish River
Unincorporated Places
State Trunklines
Major Roads
Railroads
Rivers
Lakes
Township Boundaries
County Boundaries
Cities/Villages
0 2 4 6 8 10
Miles
CUPPAD

Map 6

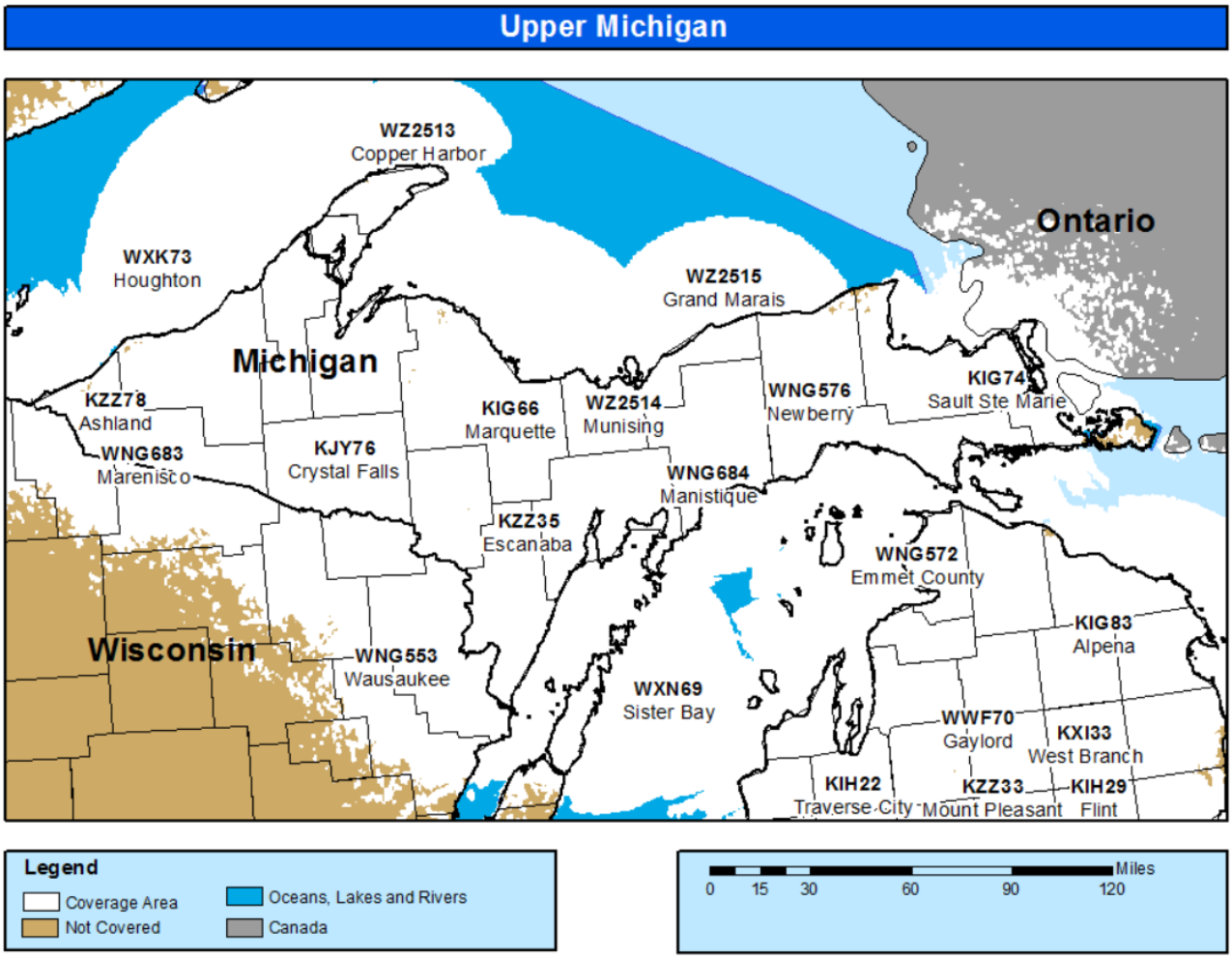

Delta County - Flood Zones and High Risk Erosion Areas 2021
Flood Zones
High Risk Erosion Areas
Unincorporated Places
State Trunklines
Major Roads
Railroads
Rivers
Lakes
Township Boundaries
County Boundaries
Cities/Villages
0 2 4 6 8 10
Miles
CUPPAD
Lake Michigan
DELTA
CITY OF GLADSTONE
CITY OF ESCANABA
VILLAGE OF GARDEN
MASONVILLE TWP
NAHMA TWP
GARDEN TWP
BALDWIN TWP
MAPLE RIDGE TWP
CORNELL TWP
ESCANABA TWP
WELLS TWP
BRAMPTON TWP
ENSIGN TWP
BAY DE NOC TWP
FAIRBANKS TWP
FORD RIVER TWP
BARK RIVER TWP
Rapid River
Masonville
Perkins
Brampton
Rock
Lathrop
Cornell
Ensign
Nahma Jct
Nahma
Isabella
Garden Corners
Fayette
Fairport
Schaffer
Hyde
Bark River
Ford River

Map 7


TURIN TWP
LIMESTONE TWP
MATHIAS TWP
AU TRAIN TWP
MUNISING TWP
INWOOD TWP
ALGER
DELTA
Lathrop
MAPLE RIDGE TWP
EWING TWP
MARQUETTE
Rock
WELLS TWP
BALDWIN TWP
SAINT NICHOLAS 31ST RD
Perkins
PERKINS 30.5 RD
Brampton
BRAMPTON 27.5 RD
Rapid River
Masonville
CORNELL TWP
Cornell
26TH RD
BRAMPTON TWP
MASONVILLE TWP
DELTA
NAHMA TWP
GARDEN TWP
DELTA SCHOOLCRAFT
Ensign
Nahma Jct
Isabella
Garden Corners
ENSIGN TWP
22ND RD
Nahma
CITY OF GLADSTONE
21ST RD
ESCANABA TWP
20TH RD
18TH RD
17TH RD
HARRIS TWP
Schaffer
CITY OF ESCANABA
WELLS TWP
BAY DE NOC TWP
15TH RD
VILLAGE OF GARDEN
MENOMINEE
DELTA
14TH RD
Hyde
Bark River
BARK RIVER TWP
Fayette
FAIRBANKS TWP
Ford River
FORD RIVER TWP
8TH RD
Fairport
Lake Michigan
GOURLEY TWP
CEDARVILLE TWP
THOMPSON TWP
41
2
35
183
Delta County - Annual Average Daily Traffic 2021
Annual Average Daily Traffic (vehicles per day)
1 - 2000
2000 - 5000
5000- 25000
Unincorporated Places
Major Roads
Railroads
Rivers
Lakes
Township Boundaries
County Boundaries
Cities/Villages
0 2 4 6 8 10
Miles
CUPPAD

Map 8

NOAA Weather Radio Coverage

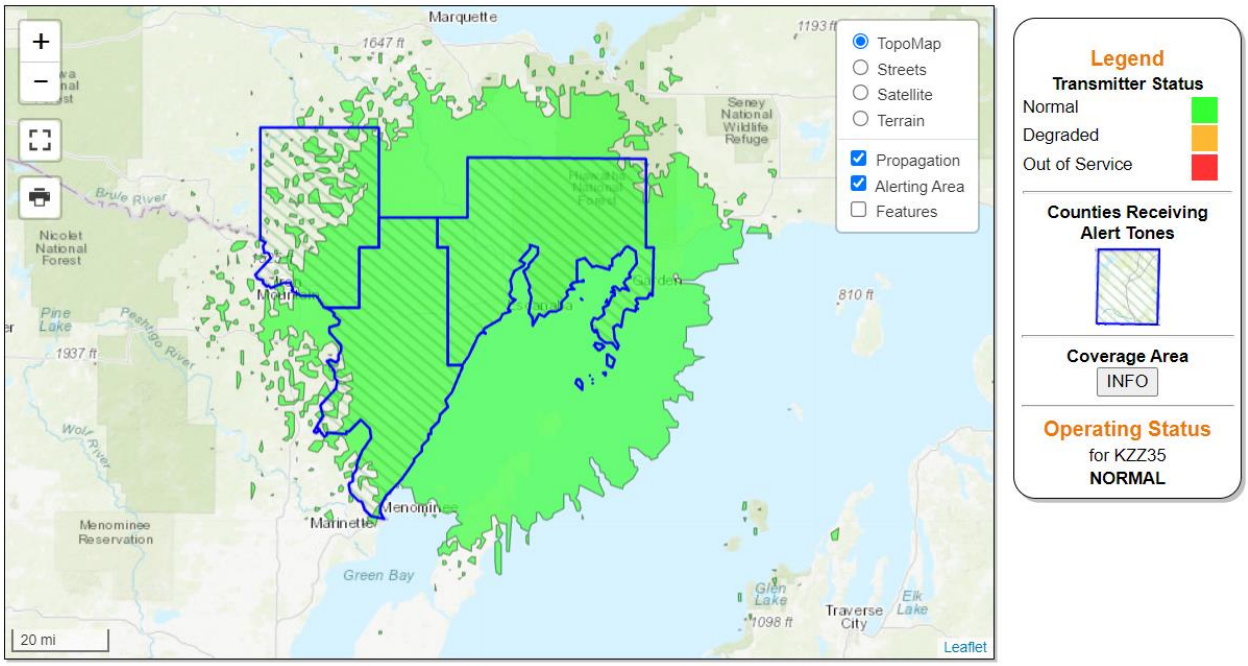


Source: NOAA, 2021

Map 8A

NOAA Weather Radio Coverage

NOAA Weather Radio – KZZ35 162.500 Escanaba



Transmitter Details	
Call Sign	KZZ35
Transmitter	Escanaba
Frequency	162.500
State	Michigan
Site Location	Escanaba, MI
Operating Status	NORMAL
Weather Forecast Office	Marquette MI

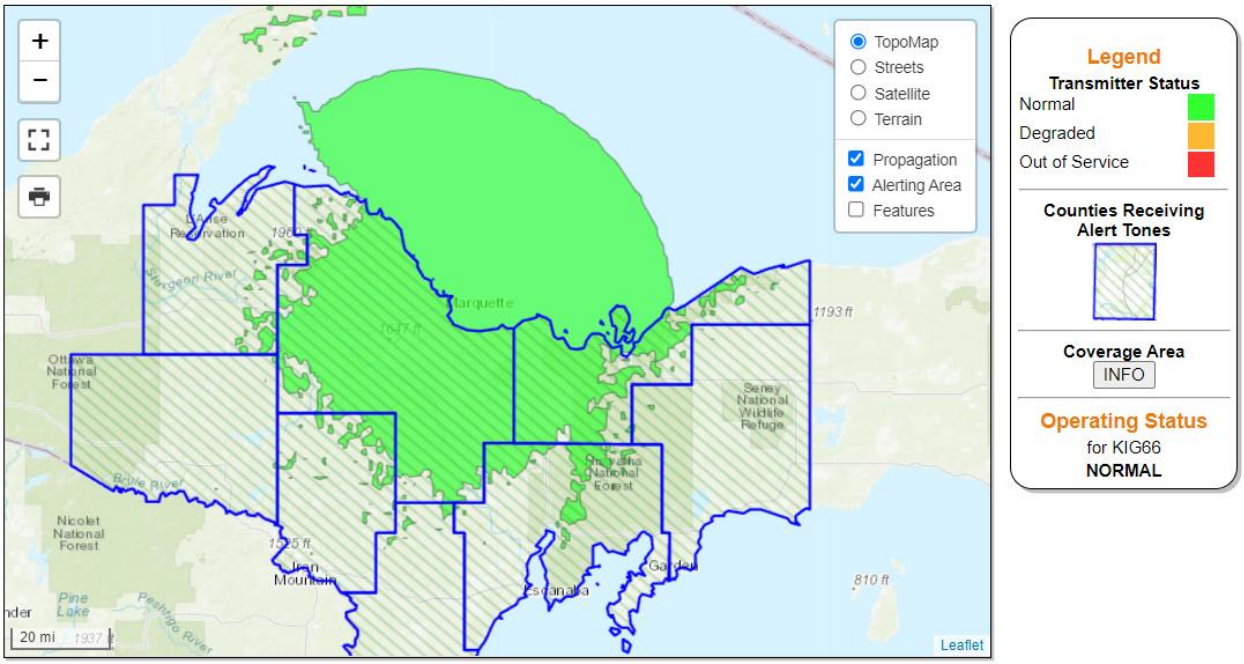
KZZ35 Counties Receiving Alert Tones			
COUNTY	**STATE**	**SAME**	**REMARKS**
Delta	Michigan	026041	
Dickinson	Michigan	026043	
Menominee	Michigan	026109	

Source: NOAA, 2021

NOAA Weather Radio Coverage

Map 8B

NOAA Weather Radio – KIG66 162.550 Marquette



Transmitter Details	
Call Sign	KIG66
Transmitter	Marquette
Frequency	162.550
State	Michigan
Site Location	Negaunee, MI
Operating Status	NORMAL
Weather Forecast Office	Marquette MI

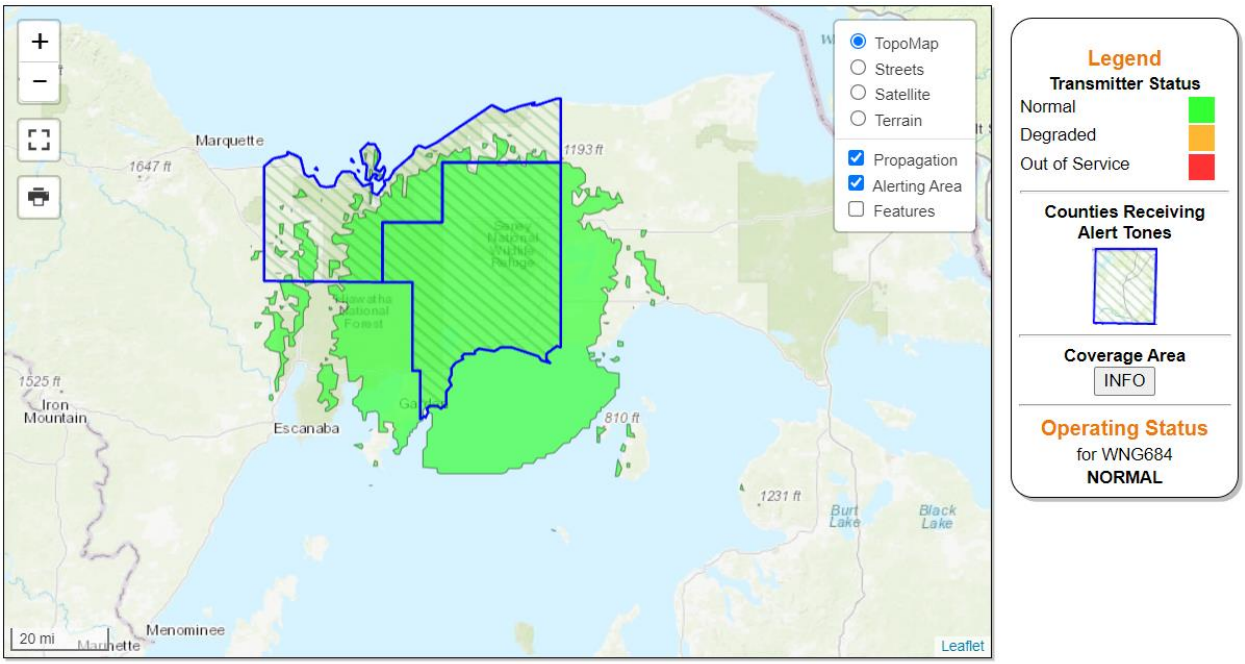
KIG66 Counties Receiving Alert Tones			
COUNTY	**STATE**	**SAME**	**REMARKS**
Alger	Michigan	026003	W1/2
Baraga	Michigan	026013	E1/2
Delta	Michigan	026041	
Dickinson	Michigan	026043	N1/2
Iron	Michigan	026071	
Marquette	Michigan	026103	
Menominee	Michigan	026109	
Schoolcraft	Michigan	026153	

Source: NOAA, 2021

Map 8C

NOAA Weather Radio Coverage

NOAA Weather Radio – WNG684 162.525 Manistique



Transmitter Details	
Call Sign	WNG684
Transmitter	Manistique
Frequency	162.525
State	Michigan
Site Location	Steuben, MI
Operating Status	NORMAL
Weather Forecast Office	Marquette MI

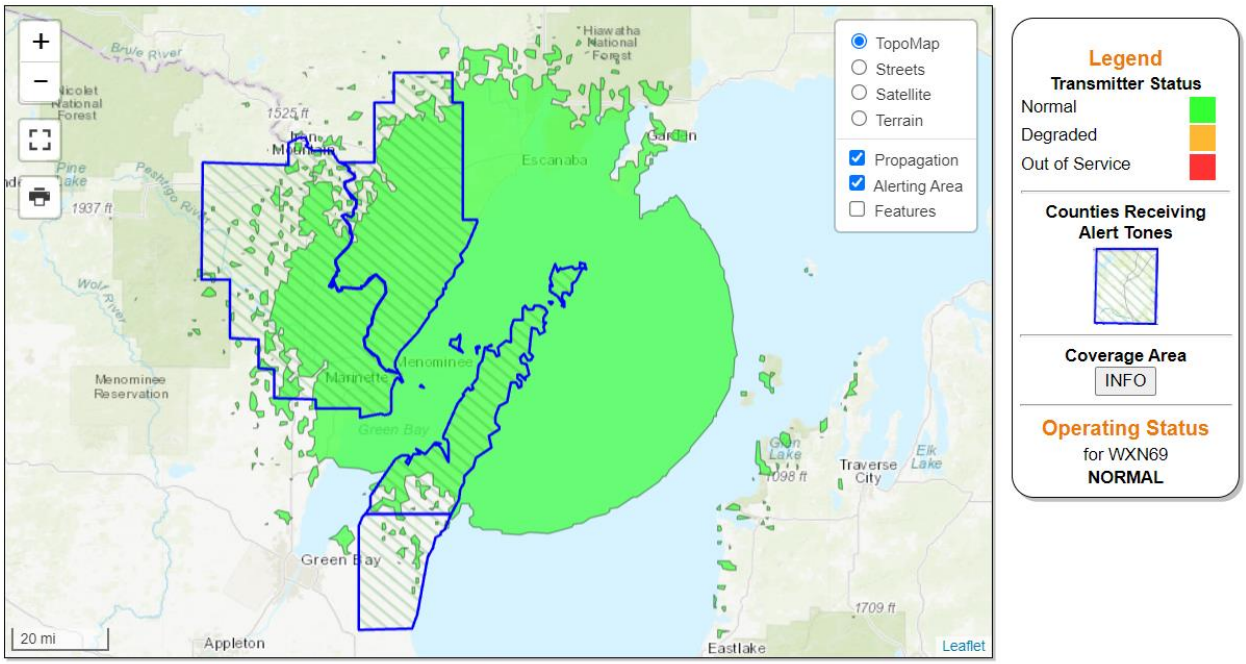
WNG684 Counties Receiving Alert Tones			
COUNTY	**STATE**	**SAME**	**REMARKS**
Alger	Michigan	026003	
Schoolcraft	Michigan	026153	

Source: NOAA, 2021

Map 8D

NOAA Weather Radio Coverage

NOAA Weather Radio – WXN69 162.425 Sister Bay, WI



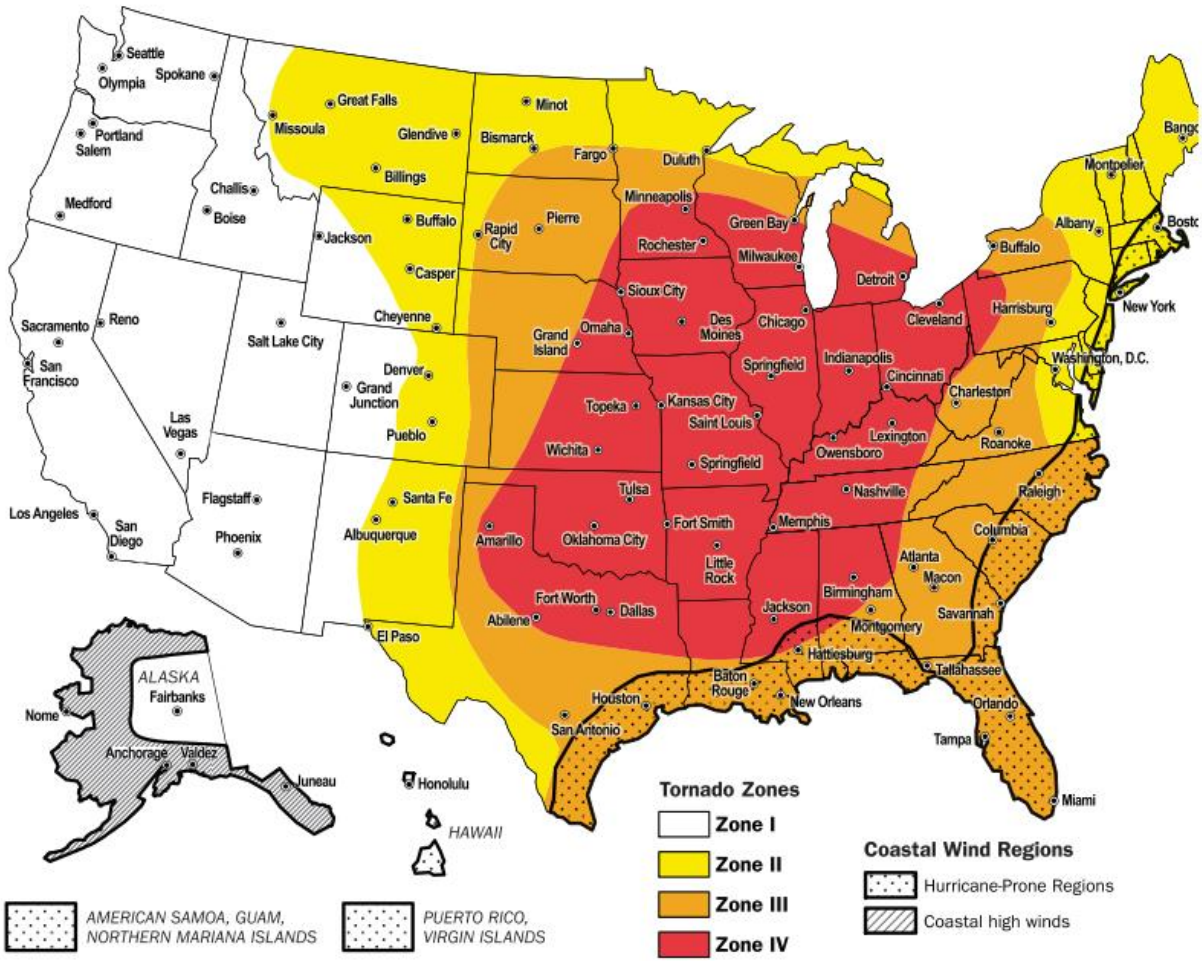
Transmitter Details	
Call Sign	WXN69
Transmitter	Sister Bay
Frequency	162.425
State	Wisconsin
Site Location	Sister Bay, WI
Operating Status	NORMAL
Weather Forecast Office	Green Bay WI

WXN69 Counties Receiving Alert Tones			
COUNTY	**STATE**	**SAME**	**REMARKS**
Menominee	Michigan	026109	
Door	Wisconsin	055029	
Kewaunee	Wisconsin	055061	
Marinette	Wisconsin	055075	

Source: NOAA, 2021

Map 9

Wind Hazards in the United States



Source: FEMA, *Taking Shelter from the Storm*, 2021

APPENDIX G

Public Communication – Delta County

Initial letter to Delta County Board requesting participating in the Hazard Mitigation Plan update process, October 22, 2018

October 22, 2018

TO: Philip Strom, County Administrator
Delta County Board of Commissioners
Delta County Emergency Management Coordinator

FROM: Peter Van Steen, Transportation Planner

SUBJECT: Update to the Delta County Hazard Mitigation Plan

This is a follow-up to previous emails or discussions regarding the Delta County Hazard Mitigation Plan Update.

You may recall, the CUPPAD Regional Commission was instrumental in assisting Delta County prepare an Update to the county's Hazard Mitigation Plan. The Plan was prepared with the assistance of the County Emergency Management Coordinator and the Local Emergency Preparedness Committee. The Plan was adopted by the County Board of Commissioners in July 2015 and subsequently approved by FEMA in August 2015.

The Hazard Mitigation Plan ensures the availability of Hazard Mitigation Assistance grants to the county and the local units of government. The current Hazard Mitigation Plan allows the county and local units to remain eligible for hazard mitigation grants.

The CUPPAD Regional Commission is submitting a grant application to update the Hazard Mitigation Plan for Delta County. As part of the grant application, we need a letter from the County stating their intent to participate in the planning process. In addition, we also need a letter of commitment from the County towards the required 25% in-kind contribution for project completion. The FEMA grant requires a 25% match; we will utilize the time spent by members of the local emergency planning committee, local governments and county staff in reviewing and providing direction with the update. The Hazard Mitigation Plan Update will include all the local units of within Delta County.

During the planning process, we will be meeting with county officials and others to obtain your input and suggestions on the plan update. Upon drafting of the final document, the county board will be requested to formally approve the document as well as the local units in the county.

We are requesting you review and sign the enclosed "Statement of Intent to Participate" form and the commitment to provide in-kind labor which will be submitted with the grant application. Please return the forms to CUPPAD by November 10, 2018. Should you have any questions, feel free to give me a call at 906.786.9234 or email at pvansteen@cuppad.org.

Enclosures

Communications from the Delta County Board of Commissioners and Delta County Emergency Management engaging in the update, November 6 and October 25, 2018

DELTA COUNTY BOARD OF COMMISSIONERS
ADMINISTRATION OFFICE
310 LUDINGTON STREET
ESCANABA, MICHIGAN 49829
PHONE: 906-789-5100
FAX: 906-789-5197

November 6, 2018

To Whom It May Concern:

Delta County will join with the CUPPAD Regional Commission in the updating of our County Hazard Mitigation Plan.

Delta County will participate in the planning process with CUPPAD staff in identifying potential hazards and providing input as to specific issues, revised goals or projects that should be included in the Plan. The participation of the local governmental units within Delta County in the planning process is important to ensure a Plan that meets the needs of the entire community.

We recognize that having an approved Hazard Mitigation Plan is necessary for the county and the local governmental units to apply for and receive hazard mitigation grants.

We look forward to our involvement in the preparation of the updated Delta County Hazard Mitigation Plan.

Sincerely,

Phil Strom
County Administrator

DELTA COUNTY
EMERGENCY MANAGEMENT OFFICE
ESCANABA, MI 49829

October 25, 2018

To Whom It May Concern:

Delta County will join with the CUPPAD Regional Commission in the updating of our County Hazard Mitigation Plan.

The County Emergency Management office and the Local Emergency Preparedness Committee will participate in the planning process with CUPPAD staff in identifying potential hazards and providing input as to specific issues, revised goals or projects that should be included in the Plan.

The LEPC will also seek out and obtain the participation of the local governmental units in Delta County in the planning process and for eventually the final adoption of the Hazard Mitigation Plan Update.

We recognize that having an approved Hazard Mitigation Plan is necessary for the county and the local governmental units to apply for and receive hazard mitigation grants.

We look forward to our involvement in the preparation of the updated County Hazard Mitigation Plans.

Sincerely,

Robert Berbohm
Emergency Management Coordinator

Worksheet sent to LEPC members via email on August 12, 2021

Delta High Hazard Mitigation Strategies

Use the following worksheet to review, comment on, and develop new mitigation strategies related to the high-ranked hazards identified in Delta County. The content below is copied from Chapter 4 of the 2015 Delta County Hazard Mitigation Plan, and can be reviewed in context at https://cuppad.org/wp-content/uploads/2020/11/DELTA_FINAL_HAZMAT.pdf If you have experience with any of the strategies created from the last plan, please include it in your response. Mitigation actions can include: local planning and regulation, structure and infrastructure projects, natural systems protection, and education and awareness programs.

It is important that members participating in this review track the time spent and report it as part of the grant funding this update. Please include this information with your submission, and return this document to either Paul Geyer, Delta Emergency Management Coordinator, pgeyer@deltacountymi.org or Ryan Carrig, CUPPAD, rcarrig@cuppad.org.

Name: _____ Time in minutes spent on review: _____

4.1.1 Severe Weather

Issues: Severe winter weather (snowstorms, ice and sleet, extreme cold) and weather associated with thunderstorms (high winds, hail, lightning) are seasonal hazards in Delta County. Winter whiteout driving conditions have occurred along US-2 near Garden Corners. Ice and sleet storms may pose a risk to property, but can also result in dangerous driving conditions and impact utility services. Overhead power lines are subject to weather and other events that may disrupt service. Emergency generators are in place at OSF St. Francis Hospital and the county jail.

Goal: Improve the capacity of Delta County to respond to and prepare for severe weather-related incidents.

Strategies:

- Maintain coverage of the NOAA Weather radio tower.
- Increase use of NOAA Weather Radios through community awareness and education programs.
- Purchase and distribute NOAA radios.
- Seek funding from public and private sources to install, maintain, and improve/expand emergency warning systems in communities throughout the County.
- Explore the possibility of instituting and the practical use of a countywide emergency notification system.
- Institute a public education program regarding emergency warning systems.
- Use snow fences or living snow fences to limit blowing and drifting of snow over critical roadway segments.
- Bury/protect power and utility lines in critical locations.
- Identify existing shelter locations, strengths, and weaknesses.
- Correct shelter weaknesses by updating equipment, providing adequate generators, and establishing shelters for vulnerable populations.
- Update and/or expand public education efforts for emergency preparedness through the County website, newsletters and press releases.
- Maintain adequate road and debris clearing capabilities.
- Install lightning protection devices on communities' communication and utility infrastructure.
- Continue with training of and provide for the increased use of weather spotters.
- Explore the establishment and implementation of a "reverse 911" calling system in Delta County.
- Institute an emergency warning system with distinct, unique sound to be associated with a specific accident or disaster.

- Have a system in place to facilitate the immediate response to ice jams on rivers.
- Provide portable pumps for use at municipal fuel pumping facilities and designated gas stations throughout the County.
- Provide emergency generators for use at all school facilities and the county airport.

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4.1.2 Hazardous Material Release and General Transportation Accidents

Issues: Heaviest traffic volumes in the County are found in the Escanaba-Gladstone urban area, which is a route for transport of hazardous materials. The US-2/41 corridor has a high concentration of intersections, access points and population. The top five accident locations within the county are located in the city of Escanaba. A tanker truck accident on M-35 resulted in the spill of diesel fuel and pollution of adjacent Lake Michigan. Railroad routes roughly follow alongside US-2 and M-35 north near by residences. Hazardous materials in transit can be accidentally released anywhere along the route.
Goal: Minimize the possibility of a Hazardous Material accident and a general transportation accident in Delta County. Institute measures to increase the County's ability to deal with such incidents.
Strategies:

- Institute training, planning and preparedness for hazmat and general transportation incidents on roadways and railways.
- Ensure fire departments and other first responders have adequate training and equipment to respond to hazmat accidents.
- MDOT, road commissions and local governments should continually examine and identify problem roadways and intersections. Improve the design of such locations to alleviate the situation and/or install appropriate traffic controls.
- Develop/update evacuation plans of facilities and of the communities. Confirm that first responder, fire departments and law enforcement agencies are aware of such plans.
- Continue to train and equip local hazardous materials emergency response teams.
- Construct connector roads to reduce congestion of arterial roads.
- Explore the establishment and implementation of a "reverse 911" calling system in Delta County.
- Ensure county road commission and local public works personnel have adequate training and equipment for spill control at hazardous materials accidents.
- Utilize a geographic information system to map storm sewers, spillways and residential wells throughout the county.
- Install signs to denote the actual speed of vehicles traveling on a roadway.
- Institute an emergency warning system with distinct, unique sound to be associated with a specific accident or disaster.
- Develop a system of alternative routes to detour traffic away from hazardous material spills while maintaining a reasonable traffic flow.
- Prepare traffic commodity flow studies.

4.1.3 Fixed Site Hazardous Material Release

Issues: There are 11 facilities in the county with extremely hazardous substances subject to the SARA Title III reporting requirements. There are other sites with lesser quantities but still considered hazardous substances. A leak of liquid chlorine dioxide at the Verso paper mill in 2005 resulted in evacuation of employees and nearby residences.

Goal: Reduce the potential for hazardous materials fixed site incidents in the County and increase the County's ability to deal with such incidents.

Strategies:

- Develop/update site emergency plans for SARA Title III sites.
- Inventory exempt SARA Title III sites.
- Regularly conduct exercises of site emergency plans and community response plans.
- Maintain facility and community training and exercise programs.
- Ensure fire departments and other first responders have adequate training and equipment to respond to hazmat accidents.
- Continue to train and equip local hazardous materials emergency response teams.
- Explore the establishment and implementation of a "reverse 911" calling system in Delta County.
- Utilize a geographic information system to map storm sewers, spillways and residential wells throughout the county.
- Institute an emergency warning system with a distinct, unique sound to be associated with a specific accident or disaster.
- Ensure fire departments complete the requirements under the SARA Title III "Right-to-Know" program.

4.1.4 Structural Fires

Issue(s): There are 20,367 housing units in the county, with just under half (43.0 %) constructed before 1960; fire stops are not common to pre-1960 homes. Building codes generally require public buildings

and businesses over 12,000 square feet to have sprinkler system. Delta County had 83 reported fires in 2011 (23 were termed arson or suspicious in nature), resulting in property loss of $1,114,850; there were no deaths reported. Wood is a primary heating source for about 9.8% of the homes in Delta County.

Goal: Reduce the County's losses from structural and commercial fires.

Strategies:

- Install or upgrade sprinkler systems in commercial or high-density residential use buildings, schools, churches, and other buildings where large masses of people congregate.
- Continue to implement a countywide fire training program.
- Continue mutual aid agreements among the various fire departments.
- Ensure fire departments and other responders have adequate equipment and training to respond to structural and commercial fires.
- Train personnel in facilities where large numbers of people congregate in the use of fire extinguishers and other fire safety procedures.
- Update site emergency plans for schools, factories, office buildings and other appropriate sites.
- Institute regular inspections of commercial, industrial, multi-family residential use buildings, day care facilities, churches, and other buildings where large groups of people congregate.

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4.1.5 Wildfires

Issues: Wildfires are usually the result of human activity. Burning debris is the single largest cause of wildfires. Given the substantial amount of forested lands in Delta County and historically the number of wildfires that have occurred, wildfire poses a significant risk.

Goal: Minimize the county's loss of property and potential human life from wildfire.

Strategies:

- Ensure that fire departments have adequate equipment and training to respond to wildfires.
- Identify escape and entry routes in areas with high wildland fire risk.
- Identify natural fire breaks (power line and pipeline ROWs, railroad grades, streams and rivers, etc.) across the landscape of the county where wildland fires might be intercepted and contained.

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4.1.6 Flooding

Issues: Flooding is a threat to several localized areas in the county. Excessive precipitation and rapid snowmelt, especially in the springtime, can cause streams to overflow their banks with resulting damage. Seasonally, as the ice and snow melt flooding is found along the many drainage ditches in the rural areas; occasionally the water is sufficient to spread and flood driveways and roads. FEMA is currently completing a coastal flood study of the Great Lakes to determine coastal flood hazards, update flood mapping, and to better prepare communities for flood-related disasters. In the past, communities obtained sand to fill sand bags; for most communities the stockpile of sand needs to be replenished.

Goal: Reduce flooding in Delta County communities.

Strategies:

- Construct elevated or alternative roads that are unaffected by flooding, or making roads more flood-resistant through better drainage and/or stabilization/armoring of vulnerable shoulders and embankments.
- Increase public awareness of the need for permits (EGLE Part 31) for building in flood plain areas.
- Enforce basic building code requirements related to flood mitigation.
- Encourage local governments to participate in the National Flood Insurance Program.
- Lake Michigan shoreline communities (Ford River, Wells, Brampton, Masonville, Ensign and Bay de Noc townships, and cities of Escanaba and Gladstone) and Delta County should continue to be active partners with FEMA as the agency proceeds to complete the Risk MAP (Mapping, Assessment and Planning) study.
- Utilize flood risks products developed by FEMA to become more informed of mitigation actions to reduce identified flood risks.
- Acquire drainage easements in order to allow for the planned and regulated public use of privately owned land for temporary water retention and drainage.
- Improve/update accurate flood plain mapping of communities.
- Institute public education of flood warning systems.
- Provide local training to officials on flood mitigation measures, flood plain management, flood proofing, and other techniques.
- Use check valves, sump pumps, and backflow preventers in homes and buildings.
- Ensure that fire departments have adequate equipment and training to respond to flood conditions.

4.1.7 Public Health

Issues: A public health emergency event in Delta County would affect large portions of the population. Medical, public health, and other agencies may not be fully prepared and/or capable of handling this type of event. Public Health, Delta & Menominee Counties are continually updating their plans and monitoring public health issues.

Goal: Increase the County's capability to prepare for and respond to public health emergencies.

Strategies:

- Implement and continue to provide countywide training and equipment to respond to a public health emergency.
- Develop a database and keep current a listing of volunteers that can assist during a major public health event.
- Provide back-up generators for water and wastewater treatment facilities, the county airport, and the county jail to maintain acceptable operating levels during power failures.
- Increase public awareness of the causes, symptoms, and protective actions for disease outbreaks and other potential public health emergencies.
- Develop and continue to update existing plans to cover possible public health emergency events.

***NEW* Cyber Security Threats**

Issues: The increasing dependence on internet-connected devices and services that rely on constant internet connections has led to attacks that seek to compromise sensitive information or disrupt services.

Goal: Increase the County's capability to prepare for data loss or compromised systems.

Strategies: (This strategy is new for the 2021 update based on the increase in risk-level from earlier updates. If enough response is received, this will be added as a new section in chapters 4 and 5.)

Letter sent to Delta County Local Units of Government on August 16, 2021

CUPPAD
Central Upper Peninsula Planning and Development
2950 College Ave. Escanaba, MI • Phone: 906-786-9234 • www.cuppad.org

August 16, 2021

Delta County Township Supervisors, Board of Commissioners, City Managers, City Council, City Commission, Village President

The Delta County Hazard Mitigation Plan was last updated, locally adopted, and approved by FEMA in 2015. The approval of this plan ensures continued availability of the full complement of Hazard Mitigation Assistance grants from FEMA and must be updated every five years. The update process has been delayed several times and the current plan has now expired. CUPPAD is currently working with Delta County Emergency Management and the Local Emergency Preparedness Committee (LEPC) to update the Hazard Mitigation Plan and solicit approval from the Michigan State Police and FEMA. Once the plan updates are complete, a draft copy will be made available. The final plan will require a resolution of adoption from each local unit of government to be included in the submission to the Michigan State Police and FEMA. CUPPAD will send notice when a final draft is available, and this resolution is needed. For reference, the 2015 plan is available on the CUPPAD website, at www.cuppad.org/plans-documents/

Part of the update process includes updating the list of identifiable hazards and collecting comments from local government units on areas of particular concern or ideas to be included in mitigation strategies. Enclosed with this letter is a list of hazards identified and ranked most recently by the LEPC, and in previous years in collaboration with local jurisdictions. This is followed by a worksheet with a place for local officials to list comments, concerns, and potential mitigation actions. Your comments will be included in the assessment and as documentation of local participation in the plan update. Please copy or distribute this worksheet as you see fit.

Also included is a space to document the time spent completing the worksheet. Each county is required to provide time toward the local match grant funding the update. Please fill out the form and include your hourly rate based on your meeting per diem or salary. It is extremely important that each jurisdiction's contribution toward the local match is documented.

Please return the completed pages to CUPPAD, c/o Ryan Carrig via email at rcarrig@cuppad.org or by mail to 2950 College Ave Escanaba, MI 49829 by September 30, 2021. If you have any questions, please call or email Ryan at 906-280-5134 or rcarrig@cuppad.org. Thank you for your cooperation!

Delta County Hazard Rankings

Hazard	2007 Plan	2013	2015	2021	
	Ranking	Ranking	Ranking	Ranking	Risk
Hazardous Materials – Transportation	1	1	1	1	
Snowstorms	3	3	3	2	
Ice & Sleet	2	2	2	3	High
Structural Fires	12	15	4	4	
Public Health Emergencies	19	10	11	5	
Hazardous Materials – Fixed Site	6	6	21	6	
Infrastructure Failures	17	19	13	7	
Cyber Security	N/A	N/A	N/A	8	
Severe Wind	4	4	4	9	
Wildfires	15	17	10	10	
Lightning and Thunderstorms	5	5	7	11	
Transportation Accidents	18	20	6	12	
Active Shooter	N/A	N/A	N/A	13	
Workplace Violence	21	8	30	14	
School Violence	14	7	26	15	Moderate
Tornadoes	7	9	15	16	
Pipeline Failures	26*	27	22	17	
Dam Failures	24	24	25	18	
Mass Casualities	N/A	N/A	N/A	19	
Great Lakes Flooding	26*	26	19	20	
Riverine Flooding	25	25	12	21	
Urban Flooding	22	22	16	22	
Temperature Extremes	10	13	9	23	
Other Environmental (invasive, exotics, diseases,	19*	21	14	24	
Hail	16	18	23	25	
Drought	23	23	16	26	
Economic Recession/Adversity	13	16	8	27	
Civil Disturbance	28	28	23	28	
Bioterrorism	9	12	20	29	Low
Terrorism, Sabotage, WMD	8	11	18	30	
Public Assembly Events	11	14	27	31	
Scrap Tire Fires	29	29	31	32	
Subsidence	30*	32	28	33	
Earthquakes	30*	30	29	34	
Nuclear Power Plant Accidents	30*	31	31	35	

Hazard Mitigation Planning Worksheet

Please review the hazard rankings as enclosed, then complete the following worksheet. Please add additional sheets if necessary.

Unit of Government: _____

Is your organization in agreement with the 2021 hazard rankings as presented? (circle)

YES NO

If no, please list the hazards you deem need to be re-ranked, and your preferred ranking:

_____

_____

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Are there areas of particular concern in your jurisdiction related to these hazards that should be identified in the Hazard Mitigation Plan?

_____

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Have you experienced any significant incident(s) related to these hazards in your jurisdiction since 2015? Please list incident and approximate date.

_____

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Do you have any ideas for potential mitigation actions/projects/programs that could be accomplished in your jurisdiction or countywide?

_____

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Please list any additional comments below:

_____

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_____

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_____

Local Time Match Documentation

How much time (in hours/minutes) was spent in completing this assessment?

_____

How many people participated in the assessment? _____

What is your approximate hourly rate? _____

Letter sent to Delta County Local Units of Government on January 10, 2022

CUPPAD
Central Upper Peninsula Planning and Development
2950 College Ave. Escanaba, MI • Phone: 906-786-9234 • www.cuppad.org

January 10, 2022

Delta County Township Supervisors, Board of Commissioners, City Managers, City Council, City Commission, Village President

CUPPAD Regional Commission, with participation from local agencies and Delta County Emergency Management, has prepared a draft update to the Delta County Hazard Mitigation Plan. Hazard mitigation is defined as any action taken before, during, or after a disaster to eliminate or reduce the long-term risk to human life and property. The approval of this plan ensures continued availability of the full complement of Hazard Mitigation Assistance grants from FEMA and must be updated every five years.

CUPPAD is now seeking public review and input on the draft Hazard Mitigation Plan. Copies of the plan are available for review at the office of the Delta County Clerk, Delta County Emergency Management, and the Escanaba Public Library. Digital copies are available on the CUPPAD website (www.cuppad.org). A notice of the review period will be published in the Daily Press.

Comments or questions on the draft plan should be directed to Ryan Carrig at the CUPPAD Regional Commission (rcarrig@cuppad.org | 906-280-5134). Written comments can be mailed to CUPPAD, c/o Ryan Carrig, 2950 College Ave., Escanaba, MI 49829. Comments will be accepted until **February 14, 2022.**

Following this review period and FEMA approval, all participating jurisdictions will be asked to formally adopt the Hazard Mitigation Plan. An additional letter and draft resolution of adoption will be sent from CUPPAD at this time.

Thank you for your participation,

Ryan Carrig

Post on the CUPPAD website with the digital copy of the draft Hazard Mitigation Plan and methods to solicit public comment.

DELTA COUNTY HAZARD MITIGATION PLAN AVAILABLE FOR PUBLIC REVIEW

Posted on January 12, 2022

The 2021 Delta County Hazard Mitigation Plan Draft is now available for public review and comments until February 14th. Please submit comments to our Assistant Planner, Ryan Carrig, at rcarrig@cuppad.org or through our contact form.

Download the plan here:

https://cuppad.org/wp-content/uploads/2022/01/2021_DRAFT_Delta-Hazard-Mitigation-Plan.pdf

This entry was posted in News, Project. Bookmark the permalink.

← Delta County Rural Task Force Committee Meeting

Alger County Hazard Mitigation Plan Available for Public Review →

Letter included with draft plans during public review period January 17-February 14, 2022

CUPPAD
Central Upper Peninsula Planning and Development
2950 College Ave. Escanaba, MI • Phone: 906-786-9234 • www.cuppad.org

January 10, 2022

Nancy Przewrocki
Delta County Clerk
310 Ludington Street
Escanaba, MI 49829

Subject: Delta County Hazard Mitigation Plan Update

Enclosed is a copy of the Draft Delta County Hazard Mitigation Plan. Would you please make it available for public review?

The CUPPAD Regional Commission, along with many community partners, has worked to draft an updated Hazard Mitigation Plan for Delta County. Hazard Mitigation is defined as any action taken before, during, or after a disaster to eliminate or reduce the long-term risk to human life and property.

Diverse local participation with the County LEPC, County Emergency Management Coordinator, local units of government, and other agencies have contributed to this planning effort. CUPPAD is now seeking public review and input on the Draft Delta County Hazard Mitigation Plan.

If there are any questions or suggestions on the content of the Draft Delta County Hazard Mitigation Plan, please refer people to contact me via email at rcarrig@cuppad.org, or phone at 906-280-5134. Questions, comments, and suggestions will be received until **February 14, 2022.**

Sincerely,

Ryan Carrig
Planning Assistant

Notice printed in The Daily Press, January 18, 2022

NOTICE
DELTA COUNTY
HAZARD MITIGATION PLAN
PUBLIC REVIEW PERIOD

CUPPAD Regional Commission, with participation from local agencies and Delta County Emergency Management, has prepared an update to the Delta County Hazard Mitigation Plan. Hazard Mitigation is defined as any action taken before, during, or after a disaster to eliminate or reduce the long-term risk to human life and property. CUPPAD is now seeking public review and input on the draft plan. Copies of the plan are available for review at Delta County Clerk's Office, Emergency Management, and the Escanaba Public Library. Digital copies are available on the CUPPAD website (www.cuppad.org).

Comments or questions on the draft plan should be directed to Ryan Carrig at the CUPPAD Regional Commission (rcarrig@cuppad.org | 906-280-5134). Written comments can be mailed to CUPPAD, c/o Ryan Carrig, 2950 College Ave., Escanaba, MI 49829. Comments will be accepted until February 14, 2022.

Article from WJMN-TV Channel 3 Marquette and CUPPAD social media post, January 27, 2022

https://www.upmatters.com/news/local-news/public-input-requested-from-residents-in-four-up-counties-for-hazard-mitigation-plans/

LOCAL

Public input requested from residents in four U.P. counties for Hazard Mitigation Plans

by: Rebecca Bartulme
Posted: Jan 27, 2022 / 01:27 AM EST
Updated: Jan 27, 2022 / 01:27 AM EST

SHARE

ALGER, DELTA, MENOMINEE AND SCHOOLCRAFT COUNTIES, Mich. (WJMN) – Every five years, counties must review their Hazard Mitigation Plans. These are documents required by the Federal Emergency Management Agency (FEMA) for communities to qualify for additional disaster planning and management grants.

Public input is being asked from people who live in Alger, Delta, Menominee and Schoolcraft counties.

"In our four counties, most of those are weather related," said Ryan Carrig, Planning Assistant, Central Upper Peninsula Planning and Development Regional Commission. "Ice and snow and thunder and lightning storms. But, it includes things like wildfires and structural fires and hazardous material releases. So, the local emergency planning committees take all of that information and put it together and then we draft the plan into a program then, that local communities can take action from to apply for grants and make changes in the community for the better to prevent these kind of disasters from happening."

Carrig gave some examples of these plans have been used in the past in U.P. communities.

"The Marquette County Hazard Mitigation Plan was used to apply for a FEMA grant to rebuild Lakeshore Boulevard and that money was funded by a pre-disaster mitigation grant," said Carrig.

FOLLOW US

FORECAST FIRST

Current	Tonight	Tomorrow
51°	41°	54°
Cloudy	Rain Precip: 100%	AM Showers Precip: 61%

TRENDING STORIES

1 Our Community Tour

News ▾ Weather ▾ Sports ▾ Community ▾ WATCH ▾ Contests ▾ TV Schedule [redacted] Search

Click on your county below to review your county's Hazard Mitigation Plan Draft.

Alger

Delta

Menominee

Schoolcraft

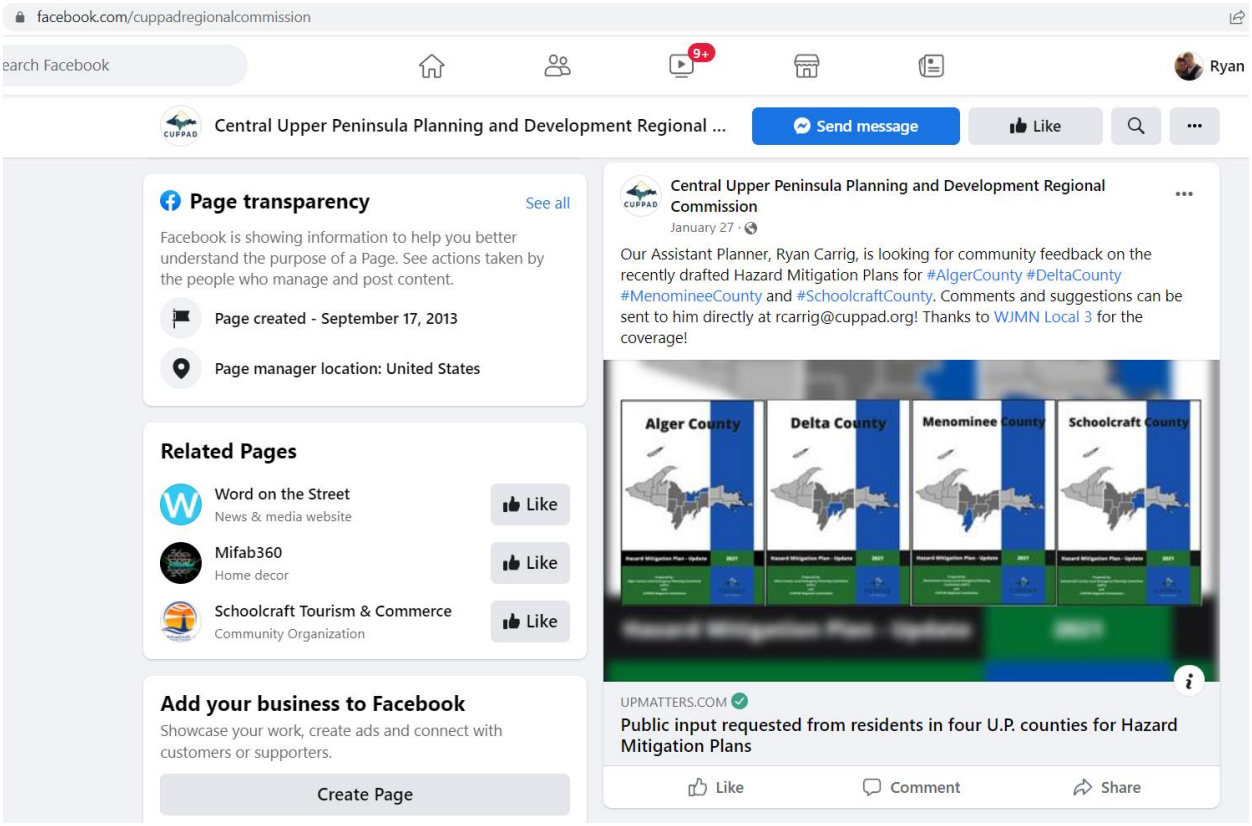
Comments on the draft will be accepted until February 14. Input can be submitted through email to Ryan Carrig at rcarrig@cuppad.org.

2 Our Community Tour Naubinway: Getting to know the ...

3 Does Michigan need to worry about jumping worms?

4 100s pulled over in northern WI during interdiction

5 New U.P. program providing access to fresh produce



Letter sent to Delta County Local Units of Government on September 6, 2022

CUPPAD
Central Upper Peninsula Planning and Development
2950 College Ave. Escanaba, MI • Phone: 906-786-9234 • www.cuppad.org

September 6, 2022

Dear Township Supervisors and Elected Officials,

CUPPAD and the Delta County Emergency Management Office have been involved in updating the Delta County Hazard Mitigation Plan. This plan has been drafted, published and publicly reviewed over the past year. We are seeking additional participation from Delta County units of government, so that we may document local participation in the update process.

Hazard mitigation is defined as any action taken before, during, or after a disaster to eliminate or reduce the long-term risk to human life and property. The Federal Emergency Management Agency (FEMA) requires Hazard Mitigation Plans be updated every five years for communities to be eligible for grant programs that can assist in mitigating the hazards identified during the planning process. The approval of this plan ensures continued availability of the full complement of Hazard Mitigation Assistance grants from FEMA for your community.

View the Delta County Hazard Mitigation Plan: https://bit.ly/DeltaHMP

We are asking that you review the plan using the link above and complete the accompanying worksheet to ensure your community's participation in the planning process. Please return the completed worksheet to the address above, or scan and e-mail to Ryan Carrig at rcarrig@cuppad.org by September 30, 2022.

Following the plan's approval by FEMA, all participating jurisdictions will be asked to formally adopt the Hazard Mitigation Plan. An additional letter and draft resolution of adoption will be sent from CUPPAD at this time.

Thank you for your participation,

Ryan Carrig
Associate Planner, CUPPAD

APPENDIX H

Hazard Mitigation Grant Programs

Hazard Mitigation Grant Program (HMGP)

FEMA's Hazard Mitigation Grant Program provides funding to state, local, tribal and territorial governments so they can develop hazard mitigation plans and rebuild in a way that reduces, or mitigates, future disaster losses in their communities. When requested by an authorized representative, this grant funding is available after a presidentially declared disaster.

https://www.fema.gov/grants/mitigation/hazard-mitigation

HMGP Post Fire Grants (PFG)

Wildfires can destroy homes, businesses, infrastructure, natural resources, and agriculture. They can also increase secondary hazards and leave areas prone to floods, erosion, and mudflows for many years. FEMA's Hazard Mitigation Grant Program (HMGP) has Post Fire assistance available to help communities implement hazard mitigation measures after wildfire disasters.

https://www.fema.gov/grants/mitigation/post-fire

Flood Mitigation Assistance Program (FMA)

Flood Mitigation Assistance is a competitive grant program that provides funding to states, local communities, federally recognized tribes and territories. Funds can be used for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program.

https://www.fema.gov/grants/mitigation/floods

Building Resilient Infrastructure and Communities (BRIC)

Building Resilient Infrastructure and Communities (BRIC) will support states, local communities, tribes and territories as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. The BRIC program guiding principles are supporting communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency.

https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities

Pre-Disaster Mitigation Program (PDM)

The Pre-Disaster Mitigation (PDM) grant program makes federal funds available to state, local, tribal and territorial governments to plan for and implement sustainable cost-effective measures designed to reduce the risk to individuals and property from future natural hazards, while also reducing reliance on federal funding from future disasters.

https://www.fema.gov/grants/mitigation/pre-disaster

Emergency Management Performance Grants (EMPG)

The Emergency Management Performance Grant (EMPG) provides state, local, tribal and territorial emergency management agencies with the resources required for implementation of the National Preparedness System and works toward the National Preparedness Goal of a secure and resilient nation. The EMPG's allowable costs support efforts to build and sustain core capabilities across the prevention, protection, mitigation, response and recovery mission areas.

https://www.fema.gov/grants/preparedness/emergency-management-performance

Pipeline and Hazardous Materials Safety Administration (PHMSA) Hazardous Materials Grant Program

The Hazardous Materials Grants Program is comprised of the following grants:

- Hazardous Materials Emergency Preparedness (HMEP);
- Assistance for Local Emergency Response Training (ALERT);
- Hazardous Materials Instructor Training (HMIT);
- Supplemental Public Sector Training (SPST);
- Community Safety (CS); and
- Hazardous Materials Safety Inspection (HMSI)

The Hazardous Materials Grants Program is funded by registration fees collected from hazmat shippers and carriers who offer for transportation or transport certain hazmat in intrastate, interstate, or foreign commerce in accordance with 49 CFR Part 107, Subpart G.

These fees also fund monitoring and technical assistance, curriculum development, and publication of the Emergency Response Guide (ERG).

https://www.phmsa.dot.gov/about-phmsa/working-phmsa/grants/hazmat/hazardous-materials-grants-program

PHMSA Hazardous Materials Emergency Preparedness Grant

The HMEP grant program was established in 1990 by the Hazardous Materials Transportation Uniform Safety Act. In 1993, PHMSA began issuing grants to assist States, Territories, and Native American Tribes to "develop, improve, and carry out emergency plans" within the National Response System and the Emergency Planning and Community Right-To-Know Act of 1986. The HMEP grant program is designed to allow grantees the flexibility to implement training and planning programs that address differing needs for each location based on demographics, emergency response capabilities, commodity flow studies, and hazard analysis.

https://www.phmsa.dot.gov/about-phmsa/working-phmsa/grants/hazmat/hazardous-materials-emergency-preparedness-hmep-grant

Homeland Security Grant Program (HSGP)

The Homeland Security Grant Program (HSGP) plays an important role in the implementation of the National Preparedness System (NPS) by supporting the building, sustainment, and delivery of core capabilities essential to achieving the National Preparedness Goal (NPG) of a secure and resilient Nation. Delivering core capabilities requires the combined effort of the whole community, rather than the exclusive effort of any single organization or level of government. The HSGP's allowable costs support efforts to build and sustain core capabilities across the Prevention, Protection, Mitigation, Response, and Recovery mission areas, including the following priorities:

- Building and Sustaining Law Enforcement Terrorism Prevention Capabilities
- Maturation and Enhancement of State and Major Urban Area Fusion Center

https://www.dhs.gov/homeland-security-grant-program-hsgp

Assistance to Firefighters Grant Program (AFG)

Fire safety grants fund critically needed resources to equip and train emergency personnel, enhance efficiencies and support community resilience.

https://www.fema.gov/grants/preparedness/firefighters

USDA Rural Development Programs (USDA-RD)

USDA Rural Development offers loan and grant programs that support economic development and essential services in areas such as: housing; health care; first responder services and equipment; and water, electric and communications infrastructure.

https://www.rd.usda.gov/programs-services

APPENDIX I

Communication with Delta County Administrator
Regarding Additional Fire Sign Actions

DELTA COUNTY ADMINISTRATION OFFICE
310 LUDINGTON ST ESCANABA, MI 49829
(906) 789-5100

January 10, 2022

Ryan Carrig
Associate Planner
CUPPAD

Mr. Carrig,

Delta County is in the middle of seeking approval of their Hazard Mitigation Plan. Before this plan is received by FEMA for final approval, I am seeking an addition to the Plan to include funding for Fire Signs throughout Delta County.

Several years ago, the issue of Fire Signs was brought to the 911 Delta County Central Dispatch Authority. It was discussed whether County millage could support the project in ordering Fire Signs for County residents. In looking into the verbiage of the millage and the service fees that fund Central Dispatch, it was determined that those funds could not be used towards this project.

County Commission decided to step in and speak with local legislators in order to request funding through the State Budget. Those requests were not approved, therefore fund raising had begun. The Townships agreed to allocate up to $5,000 each into the fund as well as the County Board of Commissioners approving a match for a USDA Grant. All of those funds were collected and the Township Association became the fiduciary through the Community Foundation. Township Association Chair, Gregg Johnson, managed those funds and certain Townships began to order signs and erect them.

As this process began, it became apparent that more funds were needed due to a problem with County addressing. In a deeper look, current addressing did not match the system Central Dispatch is state mandated to use. Therefore, the larger issue became that of public safety. First Responders can not locate residents and a uniform addressing policy was not established for the County in order to move forward.

In 2019 an Addressing Sub-Committee was formed by the Delta County Central Dispatch Authority and met regularly to develop a County Addressing Ordinance and Policy. It was enacted in 2020. Moving forward, the Sub-Committee is working with each Township to address the issue of incorrect addressing and amending certain road names and addresses to fit the grid for Central

Dispatch. This is a time-consuming project that is slow moving, however, a project in which the County feels is important and imperative to protect public safety.

Delta County knows that additional funding is needed to continue to work on this project and correct the addresses that need to be amended. Therefore, we are requesting additional funding for this project so that we can continue to work on the corrections and get the Fire Signs ordered for the Townships.

If there is additional information that is needed, please do not hesitate to reach out to the 911 Advisory Board or Delta County Administration for more information. Thank you for your consideration in this pressing matter. The County appreciates it.

Sincerely,

Emily DeSalvo

Emily DeSalvo
Administrator
Delta County