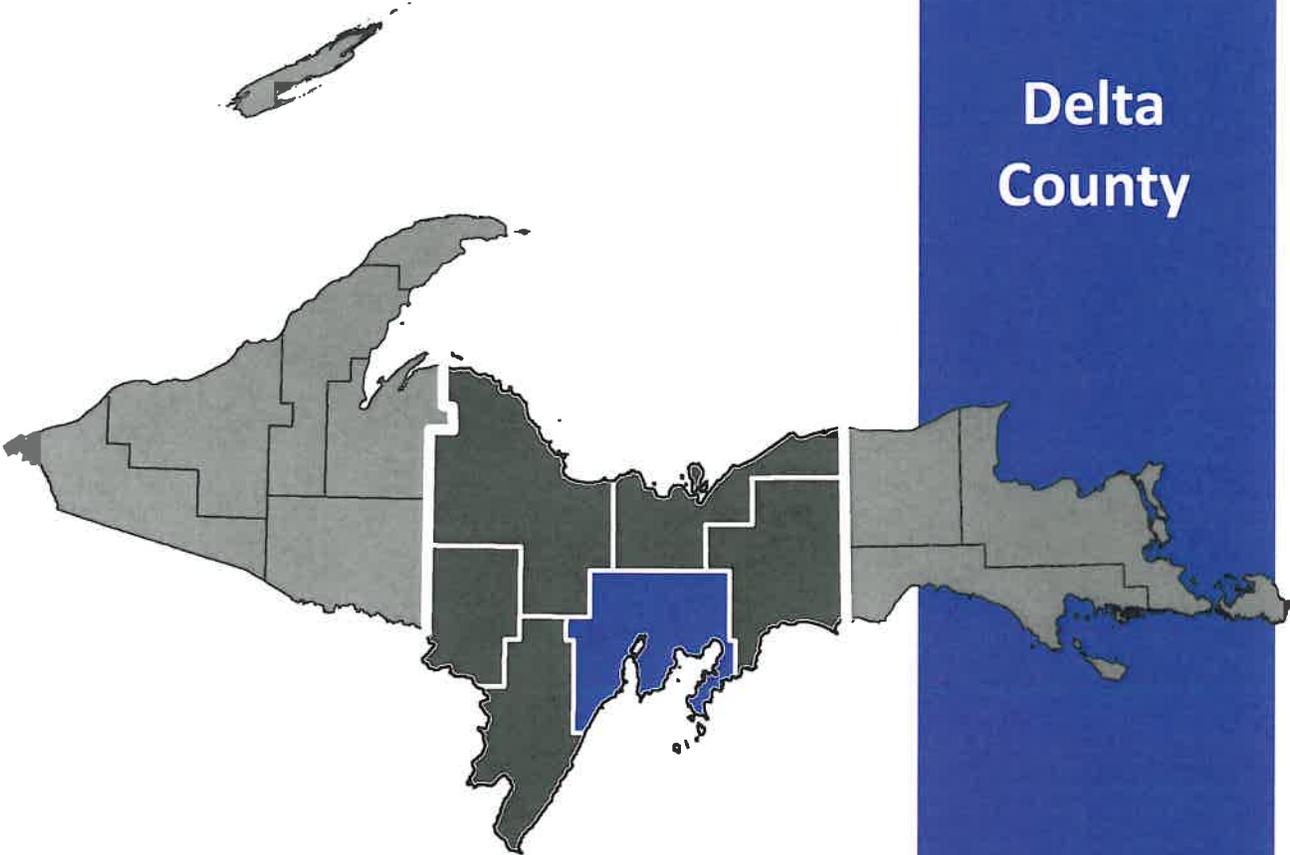


Delta County



Hazard Mitigation Plan Update

2014

Prepared By:



Delta County Hazard Mitigation Plan

Table of Contents

| | | <u>Page</u> |
|------------|--|-------------|
| 1.0 | Introduction | |
| 1.1 | Background | 1 |
| 1.2 | Plan Process | 1 |
| 1.3 | Revisions | 3 |
| 1.4 | Governmental/Public Participation | 3 |
| 1.5 | Jurisdictions Participating in the Plan Update..... | 8 |
| 2.0 | Community Profile | 1 |
| 2.1 | County Overview..... | 1 |
| 2.1.1 | Local Governmental Units | 1 |
| 2.2 | Geography..... | 1 |
| 2.3 | Climate | 2 |
| 2.4 | Community Facilities and Organizations | 2 |
| 2.4.1 | Critical Services..... | 5 |
| 2.5 | Culture and Community Profiles..... | 7 |
| 2.6 | Housing | 10 |
| 2.7 | Public Infrastructure | 12 |
| 2.8 | Areas of Land Use Conflict | 14 |
| 2.9 | Historic Resources..... | 14 |
| 2.10 | Transportation | 14 |
| 2.11 | Economic Characteristics | 15 |
| 2.12 | Population..... | 16 |
| 3.0 | Hazards | 1 |
| 3.1 | Hazard Rating and Ranking..... | 1 |
| 3.2 | Risk and Vulnerability Assessments..... | 2 |
| 3.3 | Hazard Analysis | 4 |
| 3.3.1 | Natural..... | 4 |
| 3.3.2 | Technological..... | 24 |
| 3.3.3 | Social | 37 |
| 3.4 | Identified Hazards with Affected/Vulnerable Facilities | 47 |
| 4.0 | Identify and Prioritize Strategies | 1 |
| 4.1 | Issues, Goals, and Strategies..... | 1 |
| 4.2 | Evaluation Criteria | 7 |
| 4.3 | Mitigation Strategies..... | 9 |
| 4.4 | Means to Accomplish Mitigation..... | 11 |
| 5.0 | Action Plan | 1 |
| 5.1 | Mitigation Actions..... | 1 |
| 5.2 | Plan Maintenance | 13 |
| 5.2.1 | Reviewing, Evaluating, Updating..... | 13 |
| 5.2.2 | Public Participation | 15 |

Appendices:

Appendix A – General Information

Appendix B – Historic Resources

Appendix C – Hazard Risk Analysis

Appendix D – High Risk Erosion Parcels

Appendix E – Record of Weather Events

Appendix F – Maps:

| | |
|---------|---|
| Map 1 | Base map |
| Map 2 | Population Distribution |
| Map 3 | Land Cover |
| Map 4 | Watersheds |
| Map 5 | Contours and Elevations |
| Map 6 | Major Infrastructure |
| Map 7 | Floodplains and High Risk Erosion Areas |
| Map 8 | Average Annual Daily Traffic |
| Map 9 | Wind Zones in the U.S. |
| Map 10 | Wildland Fire Risk |
| Map 11 | NOAA Weather Radio Coverage (Upper Peninsula) |
| Map 11a | NOAA Weather Radio Coverage (Escanaba) |
| Map 11b | NOAA Weather Radio Coverage (Sister Bay) |

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 Escanaba Paper Company (NewPage) paper mill facility, the Stockyard wildland fire in the northern Stonington Peninsula and a water main break in the city of Escanaba.

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 economical 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.

1.1 Background

The Federal Emergency Management Agency (FEMA) provides hazard mitigation assistance to state and local governments and to individuals through programs under the Robert T. Stafford Act, Section 404 (Disaster Relief and Emergency Assistance). The Disaster Mitigation Act of 2000 (DMA2K) amended the Stafford Act, to require communities to have an approved Hazard Mitigation Plan in order to receive FEMA funding assistance.

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.

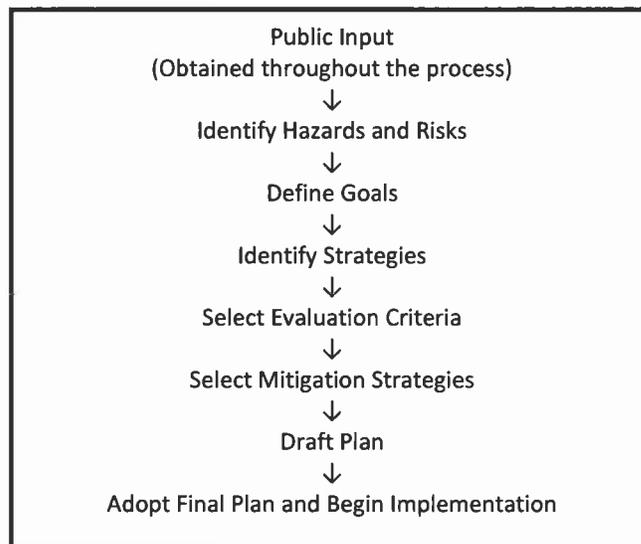
Programs that provide federal assistance are: the Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance Program (FMAP), and Pre-Disaster Mitigation Program (PDMP). Publication 920-Hazard Mitigation Grant Handbook-describes these three grant programs in detail.

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. 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. 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 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 Delta County Hazard Mitigation Plan was updated with adoption of the Plan 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.

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 in many different ways. The following sections discuss ways in which both local governments and the public participated in the hazard mitigation process.

At the onset of the planning process letters were sent to all local units of government in Delta County notifying them of the hazard mitigation plan process and asking for their continued participation.

A number of one-on-one meetings were conducted between CUPPAD staff and the County Emergency Management Coordinator to discuss topics such as the planning process, review identified hazards, formulate evaluation criteria, and discuss possible mitigation strategies.

The Delta County Emergency Management Coordinator along with the Local Emergency Planning Committee (LEPC) gave regular plan guidance. 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 monthly, with meetings open to the public. The LEPC consists of the following community representatives:

- Emergency Management Coordinator
- Fire and Law Enforcement
- Fire Departments
- Delta County Board
- County government
- Ambulance service
- Private industry
- Utilities
- Schools
- Hospitals
- Agriculture
- Transportation
- Public Health
- Public Works
- Local government
- Media

2007 Plan Development

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

| Table 1-1 2007 Plan Development LEPC Meetings | |
|--|--|
| MEETING DATE | TOPICS/DISCUSSION |
| June 10, 2003 & June 18, 2003 | Reviewed draft hazard analysis materials |
| July 10, 2003 | Reviewed draft hazard analysis materials |
| August 20, 2003 & August 22, 2003 | Reviewed draft hazard analysis materials |
| May 12, 2004 | Updated group on planning process and discussed completion of the vulnerability assessment |
| June 16, 2004 | Discussed vulnerability assessment draft materials |
| July 8, 2004 | Discussed vulnerability assessment development |
| July 14, 2005 | Reviewed and solicited possible mitigation projects for identified "high risk hazards" |
| July 28, 2005 | Reviewed and prioritized mitigation projects. Discussed plan review process |

Other meetings and input opportunities were accomplished through various local organizations where the public is always welcome and encouraged to participate. Meetings were arranged with the Delta County Township Association, Delta County Emergency Management personnel, natural resource agencies, and the Delta County Fire Chiefs Association. Topics and meeting dates are listed below in Table 1-2.

| Table 1-2 2007 Plan Development Group Meetings | |
|---|--|
| MEETING DATE | TOPICS DISCUSSED |
| February 28, 2002 – Delta County Township Association | Presented project overview and solicited input |
| December 12, 2002 – Delta County Emergency Management personnel | Reviewed hazard analysis draft materials |
| December 15, 2004 – Delta County Fire Chiefs Association | Discussed mitigation plan, past FEMA projects, potential mitigation projects, and solicited any comments and input |
| February 1, 2005 – Central U.P. Resource Conservation & Development Council | Discussed hazard mitigation plan and solicited projects from members |

2014 Plan Update Development

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

| Table 1-3 2014 Plan Update Development LEPC Meetings | |
|---|---|
| November 15, 2011 | Reviewed planning process and draft hazard mitigation plan update |
| August 12, 2012 | Reviewed planning process and draft hazard mitigation plan update |
| July 18, 2013 | Reviewed planning process and draft hazard mitigation plan update |
| September 19, 2013 | Reviewed planning process and draft hazard mitigation plan update |
| September 26, 2013 | Reviewed planning process and draft hazard mitigation plan update |
| October 17, 2013 | Reviewed planning process and draft hazard mitigation plan update |
| November 14, 2013 | Reviewed draft hazard mitigation plan update |
| January 16, 2014 | Reviewed and scored strategies |
| March 20, 2014 | Reviewed and scored strategies and action plan |

Other meetings and input opportunities were accomplished through various local organizations where the public is always welcome and encouraged to participate. Meetings were arranged with the Delta County Township Association Topics and meeting dates are listed below in Table 1-4.

| Table 1-4 2014 Plan Update Development Group Meetings | |
|--|--|
| Delta County Township Association- September 27, 2012 | Discussed plan update and solicited hazards from community leaders |
| | |

Letters were sent out to township supervisors (September 27, 2013) advising them of possible projects to be included in the county hazard mitigation plan. The supervisors were asked to review a list of suggested strategies. Follow-up phone calls were made to the individual township supervisors in January-February 2014 to solicit their ideas and suggestions on specific or unique issues experience related to the “high risk hazards” and ideas on potential mitigation projects. In addition, in November 2014 information packets about the project were sent to each Township Supervisor for review. Comments and responses received as a result of meetings, mailings, and phone conversations with supervisors or a board member from the jurisdictions in the county are listed below. The table lists comments that were solicited for the 2007 Plan and the 2014 Plan Update. In many instances, the comments expressed for the 2007 Plan are still valid for the 2014 Plan Update.

| Table 1-5 Comments Received from Local Jurisdictions | |
|---|---|
| JURISDICTION | COMMENTS |
| Baldwin Township | Minimize hazmat incident with lower speed on M-35 and County Road 428 Improved containment equipment and training for fire department members Township hall be utilized as an emergency shelter- bottled water would be needed or be stored Snow fencing could alleviate roadways drifting over with snow making them impassable. Installation of signs to warn motorists of hazardous road conditions. Flooding is not a hazard in this community. UPDATE: No additional comments |
| Bark River Township | Concern with the potential for an explosion at the local feed mill. Concern with hazmat accidents occurring at railroad crossings. Concerns with ice jams on local rivers and proper warning systems in place for warnings and evacuation. Concern with speeding through the village of Bark River- possibly install signs to denote the speed of vehicles traveling on the roadways. Flooding is not a hazard in this community. UPDATE: No additional comments |
| Bay de Noc Township | Situations involving lightning recently occurred in the township, a wildfire fire started and a horse was killed. UPDATE: No additional comments |
| Brampton Township | Need to inventory hazardous materials at various sites. Concern with train derailments and spill of hazardous materials. UPDATE: The plan addresses concerns that are important to the community. There are no additional actions that need to be taken to prepare for an emergency. |
| Cornell Township | No additional comments UPDATE: No additional comments |
| Ensign Township | Concern with adequate training for fire departments Concern with another wildland fire on the Stonington Peninsula Concern that emergency personnel are not aware of what types of hazardous |

| Table 1-5 Comments Received from Local Jurisdictions | |
|---|---|
| | materials are being transported on the highways. UPDATE: It is important that all agencies are involved. Additional actions needed are more public education about hazards. |
| Escanaba City | UPDATE: The plan is important to the community because it outlines resources the community has available and the entities that need to be contacted to acquire the needed resources. Chapter 5 also provides guidance for the mitigation of incidents. A list of local public and private assets and companies that may be utilized to mitigate special incidents. |
| Escanaba Township | Concern with the railroad-switching yard in Gladstone that is located along a major highway and near population. Suggested mitigation strategy is relocation of the Gladstone Rail switching yard to a rural site. UPDATE: Isolated areas of flooding that impact some homes, but not a community-wide concern |
| Fairbanks Township | UPDATE: No additional comments |
| Ford River Township | Concern with ice jams on the rivers: there should be a system in place to facilitate the immediate response to ice jams on the rivers. UPDATE: No additional comments |
| Garden Township | UPDATE: Concern with flooding and ensuring that floodwater is diverted to lake |
| Maple Ridge Township | UPDATE: Concern with trucks hauling hazardous materials through community. Concern with poor visibility at railroad crossings. Concern with poor visibility at intersection of M-35 and Maple Ridge 37 th Rd. Concern with businesses that store hazardous materials within community. |
| Masonville Township | UPDATE: No additional comments |
| Nahma Township | UPDATE: No additional comments |
| Gladstone City | There should be funds to train emergency personnel to respond to all types of emergency management situations. |
| Village of Garden | UPDATE: No additional comments |
| Wells Township | There should be an emergency warning system with a distinct and unique sound associated with specific accidents or disaster. Wells Twp. does participate in the NFIP. UPDATE: No additional comments |

Additional phone discussions took place throughout the plan process with various personnel associated with the County Emergency Management, Law Enforcement, Conservation District, Public Health Department, Michigan Department of Environmental Quality, and County Road Commission. All meetings held were open to the public.

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

- A letter notified Delta County, LEPC, local governments and neighboring counties that a physical copy of the draft plan was available for review at three locations in the county.
- A notice was in the Escanaba Daily Press informing the public about the Plan Update and soliciting their comments and inviting them to review and provide comments on the Plan Update.

- Draft Plan copies were made available to the Michigan State Police/Emergency Management Division, County Board, all Township Supervisors, and the County Planning Commission.
- All public review notifications described how comments and suggestions could be submitted to the CUPPAD Regional Commission. Comments were received and incorporated into the final draft of the document.

1.4 Jurisdictions Participating in the Plan Update

The following jurisdictions in Delta County recognize the need for an approved Hazard Mitigation Plan. Statements of intent to participate in the planning process were filed by the following local units:

| Unit of Government | Jurisdiction Plan Status | Date Signed |
|----------------------|--------------------------|-------------|
| Delta County | Continuing Participant | 8/12/2010 |
| Baldwin Township | Continuing Participant | 8/25/2010 |
| Bark River Township | Continuing Participant | 8/09/2010 |
| Bay de Noc Township | Continuing Participant | 9/08/2010 |
| Brampton Township | Continuing Participant | 8/05/2010 |
| Cornell Township | Continuing Participant | 8/16/2010 |
| Ensign Township | Continuing Participant | 8/18/2010 |
| City of Escanaba | Continuing Participant | 8/23/2010 |
| Escanaba Township | Continuing Participant | 9/13/2010 |
| Fairbanks Township | Continuing Participant | 8/10/2010 |
| Ford River Township | Continuing Participant | 8/09/2010 |
| Garden Township | Continuing Participant | 8/06/2010 |
| Village of Garden | Continuing Participant | 8/05/2010 |
| City of Gladstone | Continuing Participant | 8/26/2010 |
| Maple Ridge Township | Continuing Participant | 8/31/2010 |
| Masonville Township | Continuing Participant | 9/09/2010 |
| Wells Township | Continuing Participant | 8/18/2010 |

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 37,069 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 Escanaba Paper Company 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 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 5). 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, 4, and 7 illustrate watersheds, wetlands, 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 (Map 9). There were two funnel cloud sightings and one tornado during a 2005- 2012 eight year period. A tornado with wind speeds between 65- 85 miles per hour caused \$10,000 in property damage.

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, Superior U.P. Chapter | 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 <ul style="list-style-type: none"> • Senior High • Junior High • Upper Elementary • Soo Hill Elementary • Webster Elementary • Lemmer Elementary | Escanaba | Public, K-12 9-12 7-8 4-6 K-3 K-3 K-3 |
| Gladstone Area Public Schools <ul style="list-style-type: none"> • High School • Junior High 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 | Escanaba | Public, 9-12 |
| Holy Name Catholic School | Escanaba | Private, K-8 |
| Escanaba SDA Christian School | Escanaba | Private, 1-8 |
| Delta-Schoolcraft Intermediate School District | Escanaba | Public, K-12 |

Vocational Schools

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

Headstart

Headstart programming 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, and many associate degree programs. Bachelor degree programs can be completed at the college’s University Center. Participating four-year institutions include Lake Superior State University, Northern Michigan University and Franklin University. Franklin is a private institution based in Columbus,

Ohio, that provides baccalaureate opportunities via the internet.

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 expanded in 1995 to provide medical 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 |

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 and Type III 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 the Escanaba Paper Company (NewPage Corporation). Escanaba Paper Company 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 Escanaba Public Safety Department operates the county E-911 center. In addition, the department has a drug detection dog that is used throughout the region. A bomb detection dog was recently retired from the force.

Sheriff Department staff operates the 86-bed county correctional facility. There are approximately 15 deputies assigned to road patrol. The Sheriff also has a dive 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) | road, marine and snowmobile patrol, jail operation and court services |
| Escanaba Public Safety Dept. | City | 30 | combined police and fire |
| Gladstone Public Safety Dept. | City | 9 (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 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 | 12 |
| Cornell Township VFD | Cornell | 10 |
| Ensign Township VFD | Ensign | 24 |
| Escanaba Township VFD | Escanaba | 33 |
| Ford River Township VFD | Ford River | 30 |
| Garden Township VFD | Garden and Fairbanks | 23 |
| Masonville Township VFD | Masonville and Bay de Noc | 20 |
| Nahma Township VFD | Nahma | 15 |
| Tri-Township VFD | Maple Ridge; Turin and Ewing (Marquette Co.) | 25 |
| Escanaba PSD | City and Wells Township | 30 |
| Gladstone PSD | City | 29 (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 store, township hall and 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 years 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 20,214 housing units in Delta County in 2010. Occupied housing units accounted for about 79.1 percent (15,992) of the total stock. Seventy-nine percent of these units were owner-occupied and had an average household size of 2.28 persons. Household size among renter-occupied units averaged 1.97 persons. Single-unit detached structures comprise 79.3 percent of the total housing units. Mobile homes make up 7.6 percent of all Delta County housing units.

The vacancy rate of rental units was 7.5 percent. Among the 4,222 vacant units, 2,872 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.

Over half (54.0 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 (9.2 percent), electricity (5.3 percent) and fuel oil (4.9 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 25 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 5 th Street Escanaba | 1970 | Elderly (175) 1-bedroom (1) 2-bedroom |
| Les Cheneaux Apartments | 825 South 26 th Street Escanaba | 1984 | Family (18) 1-bedroom (6) 2-bedroom (12) 3-bedroom |
| West Highlands/Sandhill | 2701 1 st Avenue South Escanaba | 1977 | Elderly (123) 1-bedroom (10) 2-bedroom Family (65) 2-bedroom |
| Willow Creek Apartments | 2414 8 th Avenue South Escanaba | 1989 | Elderly (24) 1-bedroom |
| Willow Creek II Apartments | 2414 8 th 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 4 th 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 8 th Avenue South Escanaba | 2005 | Elderly (28) 1-bedroom (4) 2-bedroom |
| Willowgrove Townhomes | 850 South 38 th Street Escanaba | 2005 | Family (19) 1-bedroom (29) 2-bedroom |
| Escanaba Elderly | 700 South 38 th Street Escanaba | 2004 | Elderly (28) 1-bedroom (4) 2-bedroom |

Source: Michigan State Housing Development Authority Directory, July 2012.

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. Edison Sault Electric Company

distributes power to the Garden Peninsula. Alger-Delta Cooperative Electric Association serves much of northern Delta County, Stonington Peninsula and northwestern Cornell Township. Escanaba previously generated and distributed power from a municipal plant for distribution throughout the City. Escanaba Operating Services currently operates the plant. UPPCO (Wisconsin Public Service) and WE Energies supply most of western Delta County.

The Escanaba generating station was constructed in 1958 and produces up to 25 megawatts with two coal-fired boiler units. It served about 7,500 households in addition to commercial and industrial customers. A 12.5-megawatt diesel-fired peaking generator was brought on line early in 2003. The plant is operated by Escanaba Operating Services, a division of ProEnergy Services, LLC and municipal employees maintain the distribution system. The connecting transmission system is owned and operated by the American Transmission Company. Escanaba Green Energy LLC is currently working to purchase the plant in 2014 and plans to partner with Huntley MacMillan Energy Ventures LLC to invest in the coal-fueled plant and convert it to burn biomass.

Gladstone purchases power from WPPI but owns and maintains its distribution system. UPPCO maintains a peaking unit near Saunders Point in Gladstone.

Telephone

About 52 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 is expected to reach its capacity by around 2015. A new landfill has been developed west of the current site, which is expected to provide for at least 50 years of disposal. A recycling center 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 331.84 miles and there are 550.17 miles of county local roads. The county system is managed by the Delta County Road Commission and includes 53 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 80.92 and 45.82 miles of streets respectively. The Village of Garden has 2.25 miles of roadway. All mileages cited are as certified under Act 51.

Over 79 percent of households with workers aged 16 and older had at least two vehicles 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.

Annual average daily traffic volumes as recorded by the Michigan Department of Transportation for select trunkline locations in 2012 are as follows:

- Garden Corners 4,100
- Perkins 2,100
- Ford River 3,500
- Gladstone 9,500
- Rapid River 8,300
- Escanaba 23,700

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. 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 Escanaba Paper Company (NewPage) paper mill with rails in place to the Marquette County line near Hendricks in Cornell Township. Tracks north of the Escanaba Paper Company (NewPage) 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 the service industries. Just over one in five employed persons in Delta County is engaged in educational, health, or social services. The hospitality industry (entertainment, recreation, lodgings and food services) employs about 10 percent of Delta County’s workforce with another 15.2 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.

Escanaba Paper Company (NewPage Corporation) 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.

| Industrial Category | Delta County | Michigan |
|---|--------------|----------|
| Agriculture, forestry, fishing and mining | 2.6 | 1.4 |
| Construction | 6.6 | 4.8 |
| Manufacturing | 16.7 | 16.5 |
| Wholesale trade | 2.0 | 2.5 |
| Retail trade | 13.2 | 11.9 |
| Transportation and utilities | 5.1 | 4.1 |
| Information | 2.0 | 1.7 |
| Finance, insurance and real estate | 3.8 | 5.5 |
| Professional, scientific, management, administrative, and waste management services | 6.1 | 9.0 |
| Education, health and social services | 22.9 | 24.3 |
| Arts, entertainment, recreation, accommodations and food services | 9.9 | 9.5 |
| Other services | 4.7 | 4.9 |
| Public administration | 4.3 | 3.9 |

Source: Table DP-03 Selected Economic Characteristics, American Community Survey Estimates 2006-2010.

Delta County’s 2012 workforce - both employed and unemployed - was estimated at 18,363. In general, unemployment rates in the Upper Peninsula are typically higher than the state overall. Average annual unemployment rates for 2012 are as follows:

| | |
|-----------------|------|
| Delta County | 9.1% |
| Upper Peninsula | 9.2% |
| Michigan | 9.1% |
| United States | 8.1% |

Per capita income for 2006-2012 was \$21,413; the statewide figure was \$24,624. Median household income for 2006-2012 was \$40,496 compared to \$46,847 for Michigan overall. The percentage of Delta County residents with incomes below the poverty level was 14.4 percent for 2006-2012 while the statewide rate was 16.7 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.

| 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 |

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

| Area | 1940 | 1950 | 1960 | 1970 | 1980 | 1990 | 2000 | 2010 | % Change 2000-2010 | % Change 1940-2010 |
|----------------------|-------|-------|------|------|-------|-------|-------|-------|--------------------|--------------------|
| Baldwin Township | 887 | 689 | 647 | 610 | 769 | 726 | 748 | 759 | 1.5 | -14.4 |
| Bay de Noc Township | 456 | 386 | 266 | 312 | 343 | 320 | 329 | 305 | -7.3 | -33.1 |
| Brampton Township | 593 | 555 | 589 | 737 | 1,113 | 1,142 | 1,090 | 1,050 | -3.7 | 77.1 |
| Ensign Township | 552 | 446 | 431 | 505 | 746 | 669 | 780 | 748 | -4.1 | 35.5 |
| Maple Ridge Township | 1,394 | 1,166 | 913 | 775 | 946 | 829 | 808 | 766 | -5.2 | -45.1 |

| Area | 1940 | 1950 | 1960 | 1970 | 1980 | 1990 | 2000 | 2010 | % Change 2000-2010 | % Change 1940-2010 |
|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------------|--------------------|
| Masonville Township | 1,470 | 1,165 | 1,255 | 1,409 | 1,807 | 1,709 | 1,877 | 1,734 | -7.6 | 18.0 |
| Nahma Township | 1,245 | 954 | 569 | 499 | 517 | 491 | 499 | 495 | -0.8 | -60.2 |
| City of Escanaba | 14,830 | 15,170 | 15,391 | 15,368 | 14,355 | 13,659 | 13,140 | 12,616 | -4.0 | -14.9 |
| City of Gladstone | 4,972 | 4,831 | 5,267 | 5,237 | 4,533 | 4,565 | 5,032 | 4,937 | -1.9 | -0.7 |
| Delta County | 34,037 | 32,913 | 34,298 | 35,924 | 38,947 | 37,780 | 38,520 | 37,069 | -3.8 | 8.9 |
| 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 | -0.6 | 88.0 |
| 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 | 9.7 | 134.5 |

| Jurisdiction | 2000 Median Age | 2010 Median Age | Change 2000 to 2010 |
|----------------------|-----------------|-----------------|---------------------|
| Baldwin Township | 41.3 | 48.6 | 17.7 |
| Bark River Township | 36.3 | 41.4 | 14.0 |
| Bay de Noc Township | 51.1 | 58.7 | 14.9 |
| Brampton Township | 42.4 | 50.5 | 19.1 |
| Cornell Township | 42.4 | 47.6 | 12.3 |
| Ensign Township | 43.8 | 53.4 | 21.9 |
| City of Escanaba | 40.1 | 41.4 | 3.2 |
| Escanaba Township | 38.8 | 45.7 | 17.8 |
| Fairbanks Township | 46.6 | 55.2 | 18.5 |
| Ford River Township | 42.1 | 49.9 | 7.8 |
| Garden Township | 45.6 | 53.8 | 18.0 |
| * Village of Garden | 45.0 | 49.4 | 9.8 |
| City of Gladstone | 39.9 | 43.6 | 9.3 |
| Maple Ridge Township | 41.8 | 47.9 | 14.6 |
| Masonville Township | 42.2 | 49.1 | 16.4 |
| Nahma Township | 50.8 | 53.9 | 6.1 |
| Wells Township | 38.6 | 45.7 | 18.4 |
| DELTA COUNTY | 40.4 | 45.6 | 12.9 |

Source: U.S. Census Bureau for years cited

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.

2013 Revisions to the Hazard Rankings

In 2013, the Delta County LEPC revisited the rankings that were established for the 2007 Hazard Mitigation Plan. At numerous meetings involving local officials, police agencies, health agencies, public health, educators, emergency response agencies, and the general public the Committee discussed the Hazards presented. The Committee decided to forgo a formal numerical rating system but rather utilize information presented in this Chapter and knowledge of the Committee members gained over the years in dealing with local emergencies and attending conferences and seminars. It was decided to revise the order of some hazards. The Committee concurred with the majority of the rankings, however some were re-ordered. The re-ordering of the rankings were based on the following discussions:

- Due to recent high-profile school shootings nationwide and local weapons-related incidents, the LEPC gave school violence and workplace violence a higher hazard rating than in the 2007 plan.
- The LEPC 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 LEPC also raised the hazard ranking of wildfires, because of its likelihood to occur in localized areas such as the Stonington Peninsula.

The county hazard ranking for 2007 (the original plan) and for 2013 (the update) are shown in Table 3-1. Table 3-1 also contains the original hazard rating score from the 2007 plan. The 2007 rating reflects an order of importance as a threat within the County with higher points equating to higher risk.

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*.

| Table 3-1 Delta County Hazard Rating | | | | |
|---|-----------|--------------|-------------|----------|
| Hazard | 2007 Plan | | 2013 Update | Risk |
| | Ranking | Rating Score | Ranking | |
| Hazardous Materials – Transportation | 1 | 7.50 | 1 | HIGH |
| Ice & Sleet | 2 | 6.80 | 2 | |
| Snowstorms | 3 | 6.50 | 3 | |
| Severe Wind | 4 | 6.30 | 4 | |
| Lightning and Thunderstorms | 5 | 6.25 | 5 | |
| Hazardous Materials - Fixed Site | 6 | 6.15 | 6 | |
| School Violence | 14 | 4.00 | 7 | |
| Workplace Violence | 21 | 3.00 | 8 | |
| Tornadoes | 7 | 5.75 | 9 | MODERATE |
| Public Health Emergencies | 19* | 3.10 | 10 | |
| Wildfires | 15 | 3.70 | 11 | |
| Temperature Extremes | 10 | 4.80 | 12 | |
| Public Assembly Events | 11 | 4.50 | 13 | |
| Structural Fires | 12 | 4.35 | 14 | |
| Economic Recession/Disaster | 13 | 4.30 | 15 | |
| Petroleum Pipeline Failures | 26* | 2.20 | 16 | |
| Hail | 16 | 3.55 | 17 | |
| Infrastructure Failures | 17 | 3.30 | 18 | |
| Transportation Accidents | 18 | 3.15 | 19 | |
| Terrorism, Sabotage, WMD | 8 | 5.70 | 20 | |
| Bioterrorism | 9 | 5.60 | 21 | LOW |
| Other Environmental (invasive, exotics, diseases, etc.) | 19* | 3.10 | 22 | |
| Urban Flooding | 22 | 2.70 | 23 | |
| Drought | 23 | 2.60 | 24 | |
| Dam Failures | 24 | 2.55 | 25 | |
| Riverine Flooding | 25 | 2.40 | 26 | |
| Great Lakes Flooding | 26* | 2.20 | 27 | |
| Civil Disturbance | 28 | 1.90 | 28 | |
| Scrap Tire Fires | 29 | 1.30 | 29 | |
| Earthquakes | 30* | 1.00 | 30 | |
| Nuclear Power Plant Accidents | 30* | 1.00 | 31 | |
| Subsidence | 30* | 1.00 | 32 | |

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 Climatic Data Center (NCDC). The NCDC Storm Events Database contains various types of storm reports January 2006 to Present. NCDC 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 describes weather events in Delta County from 1950 – 2013.

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, 2012, unless otherwise indicated. For simplification, the dates are shown as 2005-2012, which is an eight-year inclusive period.

3.3.1 Natural

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: 11TH

Human activity is responsible for 98 percent of wildfires. Debris burning is the single biggest cause, while lightning, often regarded as a major reason, is directly linked to only about 2 percent of all wildfires. Wildfires can be separated by those that threaten public safety and

those that threaten natural resources, e.g., timbered areas. Given the vast amount of forestland in Delta County, wildfires pose a significant risk.

With an ever-increasing number of rural homes and seasonal dwellings being built in wildland areas, there is a greater potential for life and property loss. To mitigate these issues, Michigan's Department of Natural Resources (MDNR) runs the Firewise Communities Wildfire Protection Program, a program designed to educate governmental officials, builders, bankers, architects, etc. on ways to design, build and site wild land/urban interface structures to be more resistant to wildfires. Bay De Noc, Ensign, Masonville, Nahma, and Garden Townships participate in the program.

Between 2007 and 2011, Michigan's 2,260 forest fires consumed a total of 42,055 acres. The fire season of 2007 accounted for more than half of the total reported fires, with 22,605 acres burned that year. 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 Forest, Mineral and Fire Management division, there were 46 wildfires in Delta County between 2007 and 2011 (9.2/yr.), which consumed a total of 259.40 acres (51.9 ac./yr.). The average wildfire burned slightly over five and one-half (5.6) acres. Wildfires suppressed by the Forest Service, Park Service, Bureau of Indian Affairs (BIA) which responded within their protection areas are not included in these statistics. They also do not include any fires that the local fire departments have responded to that did not require assistance from the MDNR. Debris burning was the cause of 43 percent of the wildfires in Delta County followed by miscellaneous causes accounting for 27 percent of the fires. According to the MDNR report, fires across the Upper Peninsula from 2007-2011 cost approximately \$1.8 million dollars, including expenditures for MDNR labor, keyman labor, vendors, equipments and contributed costs. Expenses for Upper Peninsula fires averaged approximately \$78.65 per acre from 2007-2011.

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.

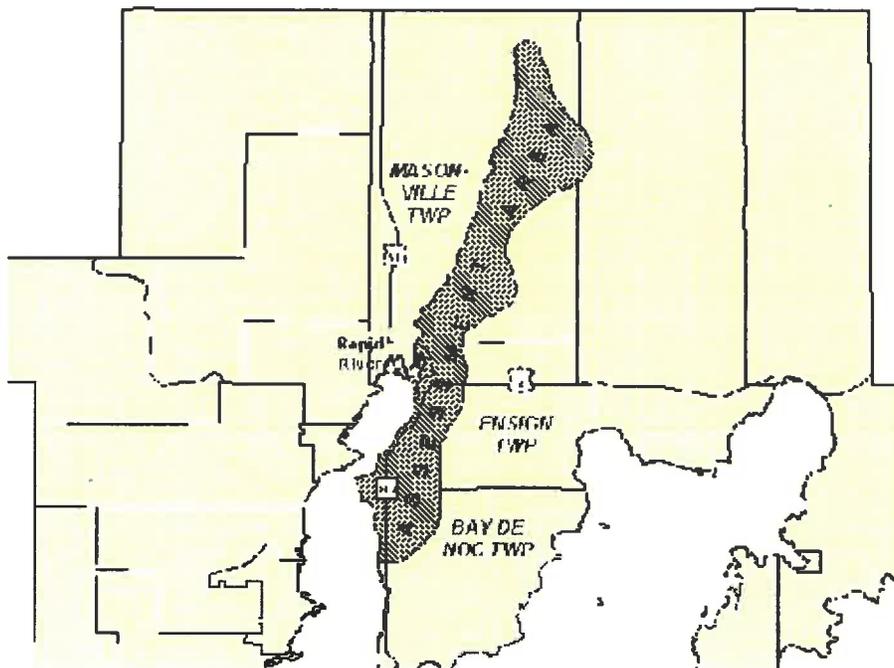
The National Weather Service provides fire weather forecasts to federal agencies in the area. During periods of high fire danger, the NWS prepares a daily Wildfire Potential Statement.

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 Map 11. Taken into consideration with the numerous forest fires in the county, wildfires have a high probability of occurrence. 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. The townships located in the Stonington Peninsula area, Bay de Noc, Ensign and Masonville, completed a comprehensive fire preparedness plan under Michigan's "Firewise Communities Wildfire Protection Program" in 2011. The plan was designed for the Stonington Peninsula area in general, with a focus on the high-hazard area.

Map 3-1
Stonington Peninsula Firewise Assessment 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.

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 Environmental Quality requires special permits for construction activities within identified at-risk erosion areas. Map 7 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.

| 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, June 12, 2012

Flood hazard maps illustrate susceptible areas when a stream reaches full-bank level. The average Michigan floodplain map is 16 years old. Furthermore, not all flood-prone areas have been mapped. 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.

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.

The National Oceanic and Atmospheric Administration (NOAA) reported there were five flood events in the county between January 1, 2005 and December 31, 2012. The most recent was a flash flood that occurred in June 2010 in Cornell Township which resulted in a washout of County Road I. An ice jam forming on the Rapid River caused flooding over US-2 in April 2005.

Riverine Flooding

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

RISK: LOW

RANKING: 26th

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 a 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.

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.

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: LOW

RATING: 27TH

The average level (in feet) of Lake Michigan from 1918 to 1998 is 579.3. Record high levels were reached in the period from February 1986 to January 1987 that were about 5 feet above the long-term average. High levels, when accompanied by onshore storms, 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, the record low periods to date occurred in 1964-65.

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. Damage information is not available.

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 low in recent years with no threat of flooding, so the probability of seiche occurrence is low. However, erosion did occur during high water periods in the late 1980's. 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 (Map 7).

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: LOW
RANKING: 23RD

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.

Impact and Extent

Weather records from the past eight 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.

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 2012, inclusive. 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), Marquette (1,000 watts), and Sister Bay, Wisconsin (1,000 watts). Under most conditions, the reception range is about 40 miles. Coverage areas are included as maps 11A, 11B, 11C, 11D, and 11E.

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

Between 2005 and 2012, inclusive, there were 62 reported deaths and 713 injuries in the state due to hazardous and severe weather conditions. Total property and crop damage attributable to these weather events was \$842,038,000.

Delta County has experienced severe weather events in all seasons. The most damaging weather events have been caused by high winds.

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: 9TH

Historic weather records from 1969 through January 2004 reflect 12 tornadic events in the county. The most intense event was in July 1987 that resulted in property damage of \$25,000. The most property damage (\$2.5 million) incurred during a tornado in July 1992. This event also resulted in two injuries. Additionally, three funnel clouds were reported in 1998 with no reports of damage.

There have also been two documented sightings of funnel clouds and one tornado in the county within the past eight year period (2005-2012). Recently, a damaging tornado occurred in July 2008 with property damage of \$10,000, but no reported deaths or injuries.

The state has averaged 16 tornadoes and funnel clouds per year between 2005- 2012. Tornadoes pose a high risk to human life and property. Total property and crop damage reported statewide in that time period was in excess of \$345 million.

| 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: Tornadoic events are sporadic in Delta County. Only three tornadoic events (one tornado and two funnel clouds) were reported in Delta County during the past eight years. Historic data has shown twelve tornadoic events (nine tornados and three funnel clouds) in a 36 year period. The possibility of a tornadoic event occurring per year in the county is 32 percent with a 7 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.

| Time frame | # of events | Injuries | Casualties | Property damage | Crop damage | Damage total |
|------------------------------|-------------|----------|------------|-----------------|-------------|-----------------|
| January 1969 to January 2004 | 12 | 3 | 0 | \$2.853 million | \$0 | \$2.853 million |
| 2005- 2012 | 3 | 0 | 0 | \$10,000 | \$0 | \$10,000 |

| | |
|---|--------------------|
| Average events/year (15 ÷ 44) | 0.34 |
| Average injuries/year (3 ÷ 44) | 0.07 |
| Average casualties/year (none reported) | 0 |
| Estimated annual property damage (\$2.863 million ÷ 44) | \$65,068 |
| Estimated annual crop damage (none reported) | \$0 |
| Estimated annual damage (\$2.863 million ÷ 44) | \$65,068 |
| *Potential annual losses to critical facilities \$65,068* 25) | \$1,626,700 |
| *Potential annual losses to educational facilities \$65,068* 21) | \$1,366,428 |

*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.

The most recent occurring tornado was a confirmed EFO tornado which touched down one mile south of Masonville on July 25, 2008. An NWS storm survey found a 50-yard wide by 150-yard long EFO-rated tornado track near the intersection of Bayshore Drive and 26th Road. The tornado uprooted large trees, drove a sheet of plywood through a motor home and tore off a portion of a trailer roof causing \$10,000 worth of property damage.

A tornadoic event within an intensively developed area would cause the most property damage and affect the most 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.

Hail

Hazard description: An extreme weather event with the potential to damage property and

compromise human safety.

RISK: MODERATE

RANKING: 17TH

Between 2005 and 2012 there were 24 hail events recorded in the county, 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 two instances; Garden in July 2007 with \$2,000 of property damage and at Maplewood in July 2011 with \$1,000 of property damage. Risks associated with hail storms 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.

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. 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 \$3,000 from these two events. Anecdotal evidence suggests there has been localized damage from hailstorms, but 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: HIGH

RANKING: 5th

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 2005 through 2012 inclusive; cite 29 thunderstorm events with no injuries or deaths. During this period, property damage attributed to the storms was assessed at \$56,200. The thunderstorms had winds speeds up to 89 miles per hour (mph). Thunderstorms occur an average of 3 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: HIGH

RANKING: 4TH

Impact and Extent

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 wind storms were reported in Delta County; there were two reported injuries and total damage was in excess of \$13.5 million. Between 2005 and 2012 six high wind events were recorded in the county; combined, these storms caused more than \$33,000 damage to property. The most costly of the storms occurred in July 2010 with winds of 69 miles per hour with property damage of \$20,000.

Wind zones reflect the number and strength of recorded wind events per 1,000 square miles. These designations were established for engineering design purposes (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).

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 severe thunderstorm and high wind event can be expected 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 damages 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.

| 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 |

| | |
|--|------|
| Average events/year (87 events ÷ 55 years) | 1.58 |
| Average injuries/year (2 ÷ 55 years) | 0.04 |

| | |
|--|------------------|
| Estimated annual property damage (\$1.366 million ÷ 55 years) | \$24,840 |
| Estimated annual crop damage (\$12.250 million ÷ 55 years) | \$222,727 |
| Estimated annual damage (\$13.616 million ÷ 55 years) | \$247,567 |
| *Potential annual losses to critical facilities (\$24,840* 25) | \$621,000 |
| *Potential annual losses to educational facilities (\$24,840* 21) | \$521,640 |

*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: 3RD

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; for the 2012-2013 winter storms forced schools to close for six days. 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. Over the past two decades (1981 - 2011), snowfall has averaged 49.5 inches annually at Escanaba.

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.

Ice and Sleet

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

RISK: HIGH

RANKING: 2ND

Historic weather data reports ice storms have occurred in January 1994, January 1998, March 2002, and December 2002. Property damage caused by the January 1994 storm was estimated at \$5 million. Recent weather data (2005 - 2012) reveals an ice storm occurred in January 2005.

Such storms pose a low risk to human life, but a higher risk to property. For humans the risks are 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 snowloads on structures. Widespread property damage to utility lines, trees, and light duty coverings such as awnings, canopies, and carports are anticipated.

Historic weather data reported 28 ice storms occurring between 1993 and 2004. Recent weather data (2005 - 2012) reveals 58 snow and ice events in Delta County that have an estimated total property damages of \$75,000, although additional damage likely occurred. Table 3-6 shows the extent of this damage. There were no human casualties reported.

| Timeframe | # of Events | Casualties | Property Damage | Crop Damage | Damage Total |
|---------------------|--------------------|-------------------|------------------------|--------------------|---------------------|
| Jan. 1993-Jan. 2004 | 28 | 0 | \$5.05 million | 0 | \$5.05 million |
| 2005- 2012 | 58 | 0 | \$75,000 | 0 | \$75,000 |

| | |
|--|--------------------|
| Average events/year (78 ÷ 19) | 4.68 |
| Average injuries/year (none reported) | 0.00 |
| Estimated Annual Property Damage (\$5.125 ÷ 19) | \$269,737 |
| Estimated Annual Crop Damage (\$0 ÷ 19) | \$0 |
| Estimated Annual Damage (\$5.125 ÷ 19) | \$269,737 |
| *Potential annual losses to critical facilities \$269,737* 25) | \$6,743,425 |
| *Potential annual losses to educational facilities \$269,737* 21) | \$5,664,351 |

*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: 12TH

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.

| Wind (mph) | Temperature (°F) | | | | | | | | | | |
|------------|------------------|----|----|----|----|-----|-----|-----|-----|-----|-----|
| | 35 | 30 | 25 | 20 | 15 | 10 | 5 | 0 | -5 | -10 | -15 |
| 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.

Vulnerability: Since temperature extremes impact wide areas, the entire population of the county is at least indirectly affected. Between 2005 to 2012 inclusive, there have been eight instances of extreme or very cold wind and accompanying wind chill. Events like these are likely to occur once or twice a year. In some cases, the wind chill has been a deciding factor in the closing or delay of school. Extreme cold temperatures of around negative 30° F were recorded in Escanaba in February 2007 and January 2009. 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. Each year, the area experiences periods of frost/freeze in the early part of June. There have been four significant instances of frost/freeze events between 2005 and 2012, but there was no reported crop damage.

Drought

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

RISK: LOW

RANKING: 24TH

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.

Vulnerability: Tourism and forest production are mainstays 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.

The NOAA National Climatic Data Center reported no drought conditions for Delta County between 2005 and 2012.

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: 30TH

Impact and Extent

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.

Environmental

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

RISK: MODERATE

RANKING: 22ND

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. Invasive species cost the nation \$130 billion each year according to some estimates. The U.S. Fish and Wildlife Service estimate the potential economic impact at \$5 billion from 2000 to 2010 to United States (U.S.) and Canadian water users within the Great Lakes region alone. 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 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 populations 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 three bovine TB status areas: TB Free status in the Upper Peninsula and 57 counties in the Lower Peninsula, Modified Accredited Advance Zone (MAAZ) status in seven counties of the Northern Lower Michigan and Modified Accredited Zone (MAZ) status in the four counties of Northeastern Lower Michigan. Two beef cattle herds were diagnosed as infected with Bovine TB in northeast Lower Michigan in 2011. 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. It is not yet known how the disease is spread although saliva, urine and feces are considered the most likely means.

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. 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. Michigan had 248 lab positive human cases in between 2003 and 2011 with 20 deaths. There were 28 lab positive human cases in the Upper Peninsula.

As of November 20, 2012, Michigan reported 229 cases and 14 fatalities. Cases include laboratory- confirmed infections and presumptive viremic blood donors. This is the highest

number of cases reported in any single year since the initial outbreak of 2002. Although no cases were confirmed in the Upper Peninsula, 21 Michigan counties reported West Nile virus activity.

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.

More than 16,000 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 to characterize Lyme disease have been conducted for more than ten years. This includes physician-based active surveillance systems, ecological studies, and several laboratory evaluations conducted for the study of Lyme disease. From January 1, 2012 through August 31, 2012, 30 cases of Lyme disease were laboratory confirmed in the Upper Peninsula. 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.

3.3.2 TECHNOLOGICAL HAZARDS

Structural fires, infrastructure failures, and fixed site or transportation-related hazardous materials releases are the most common technological hazards.

Infrastructure Failures

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

RISK: MODERATE

RANKING: 18TH

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. The Midwest Interconnect 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. Local electric generation has historically been provided by the Escanaba Municipal Power Plant. Both Escanaba and the Upper Peninsula Power Company (UPPCO) have diesel generating units and UPPCO also has hydroelectric generators.

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.

Failures of communication, electrical, gas, and other utility infrastructure would have a similar 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: MODERATE

RANKING: 14TH

Most structural fires are caused by human error. Citizen injuries attributable to fire occur every 23 minutes in the United States. About 85 percent of all fire fatalities happen in the home with one-fourth linked directly to smoking. Delta County had a reported 83 (23 were arson or suspicious in nature) fires in 2011 resulting in property loss of \$1,114,850. During the same time frame, statewide there were more than 29,000 fires resulting in a loss of \$5.9 million.

According to statistics prepared by the State Fire Marshall, 73 percent of residential fires occur in single or two-family dwellings. Another 17 percent occur in multi-family structures. Cooking related incidents are the leading cause of house fires, followed closely by those caused by smoking or matches. Most residential fires originate in kitchens or bedrooms. 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.

Both Escanaba and Gladstone Public Safety Departments have thermal imaging cameras that are available to other departments. Equipment capabilities among departments vary. The training and turnout gear costs for each new member approximate \$2,000. 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. Structural fires in the county (based on information from the National Fire Incident Reporting System (NFIRS) for the years 2011, 2008, 2006, 2005, and 2004) have averaged \$23,993 in damage per occurrence with 99 fires being the annual average. One fatality and five injuries resulted from arson/suspicious fires.

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: LOW

RANKING: 25TH

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 Part 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 MDEQ 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 MDEQ 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 Environmental Quality with inspections required every five years. Escanaba River #3 Dam (Escanaba Township, just south of County Road 420 and Reno Creek) is rated “significant hazard” with inspections required at four year intervals. Escanaba River #4 Dam (Cornell Township at Boney Falls) is 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. In recent years 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.

The impacts of a failure at Escanaba River Dam #3, rated a significant hazard, and Dam #4, rated as a high hazard, 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 NewPage 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: 31ST

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: 32ND

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: 29TH

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.

Areas of concern include salvage yards and an abandoned industrial site adjacent to the Canadian National Railroad overpass of County Road 426.

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 acid 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 currently 14 such sites in the county.

A team of law enforcement personnel raided a methamphetamine lab in Wells Township in December 2002. The product and its production process are extremely hazardous. Specialized personnel were brought in for cleanup of the site. Several methamphetamine labs and dump sites have been discovered in neighboring counties since then.

A storage tank leak of liquid chlorine dioxide at the NewPage 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.

A railroad tank car exploded at a chemical plant in downstate Riverview killing three plant employees and injuring several others. The accident occurred in July 2001 during unloading procedures as a transfer line fractured causing a release of poisonous and flammable gas. The incident caused the evacuation of about 2,000 residents as chlorine was released from an adjacent tank car parked at the facility siding.

There have been no reported accidents involving hazardous materials within the past eight years.

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. Of the eleven facilities, six 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 five 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 14 sites within the county that have smaller quantities of hazardous materials. There are higher risks for spills and fires at these sites.

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.

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.

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 (MDEQ) 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.

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 2000 totaled 19,000. Also in 2000, more than 1.5 million pounds of air

freight was handled at the facility.

The Federal Railroad Administration (FRA) reported there were 2.3 accidents per million train miles in the United States in 2012. Derailments accounted for 74 percent of the accidents. The most common accident cause is attributable to human action (37 percent); 34 percent of the accidents resulted from track defects. Less than 3 percent of the accidents were caused by signal defects. Nationwide, there were 25 train accidents in 2012 that resulted in the release of hazardous materials forcing more than 2,000 persons to be evacuated.

Statistics from the FRA report almost 2,000 incidents at highway-rail crossings in 2012. These incidents resulted in 239 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) |

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.

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 (2011) shows an average of over 20,000 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 1,400 vehicles per day.

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 polyphosphorus 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 1,430 crashes in 2011. Six of the crashes resulted in fatalities and 169 had personal injury, with most involving property damage. While many of the crashes occurred on city streets, 451 accidents occurred on US highway and 227 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

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. One-third of the accidents were caused by human error and 42 percent were the result of track defects; there were no fatalities or injuries reported. During the same time period, there were six incidents at highway-rail crossings in the county with no fatalities or reported injuries; 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 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.

Petroleum Pipeline Failures

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

RISK: MODERATE

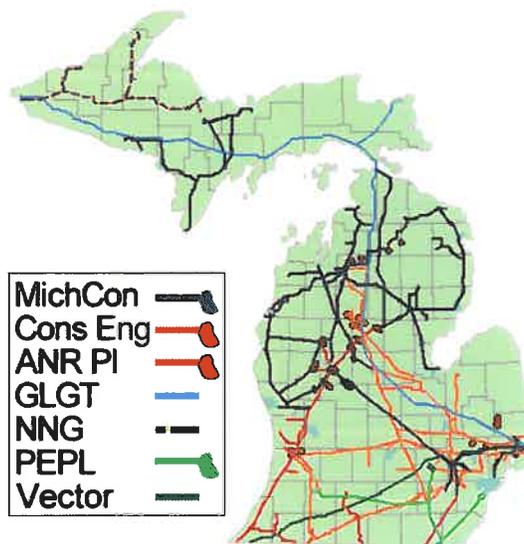
RANKING: 16TH

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. Map 6 shows the pipeline infrastructure in Delta County. Map 3-2 below shows the locations of pipelines in Michigan.

Map 3-2: Michigan's Pipeline Network



Source: Michigan Public Service Commission, 2002

Additionally, a large gas dome owned by BP and Enbridge from which natural gas is extracted is located off US-41 near Rapid River. If this dome were to explode, the affected area covers approximately a five-mile radius and includes residential areas and businesses.

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 38 correctional facilities are in Delta County. Prison security levels range from Level VI (highest) to Level I (easily managed prisoners). The 88-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: MODERATE

RANKING: 20TH

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. Contemporary electronic information systems play critical roles in all aspects of everyday life. Sabotage to these systems through the introduction of computer viruses requires constant vigilance. Physical destruction of the means by which information is transmitted and stored is an ever-present threat.

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 City of Escanaba Department of Public Safety houses a regionalized Weapons of Mass Destruction Team which is part of the Rapid Response Team Network (RRTN) and can be activated by either a call from the Michigan State Police or the Federal Bureau of Investigation. The City of Escanaba RRTN is currently working with Region 8 (Upper Peninsula) Homeland Security and Emergency Management Board Members in an attempt to transition the team into a regional hazmat response team.

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

RISK: MODERATE

RANKING: 21ST

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.

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: MODERATE

RANKING: 13TH

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 |
| Mid-Winter Reunion Pow-Wow | Escanaba | February |
| 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 |
| U.P. Vintage Tin Antique Car Show | Escanaba | July |
| Blessing of the Fleet | Fayette State Park | July |
| Heritage Days | Fayette State Park | August |
| Upper Peninsula State Fair | Escanaba | August |
| U.P. Off-Road 100 | Bark River | August |
| Art-in-the-Park | Escanaba | August |
| Wells Ice Arena Events | Wells Twp. | Sept. – Mar. |

| Table 3-8 Annual Large Assembly Events, Delta County | | |
|--|----------|-----------|
| Name of Event and Description | Location | Month |
| Labor Day parade and festivities | Rock | September |
| Labor Day festivities | Nahma | September |
| Steam and Gas Engine Show | Escanaba | September |
| Christmas Parade | Escanaba | December |
| Christmas in the Village | Escanaba | December |
| 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: 7TH

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. During the 2011-2012 school year, throughout the state of Michigan there were a total of 128,290 separate reportable incidents. As a result of the instances,

statewide there were 1,893 expulsions as result of physical assaults, drugs, and non-firearm related incidents.

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. There have been 254 separate incidents reported within the six school districts of Delta County. This resulted in four expulsions due to weapons, drugs, prohibited behavior, or violence. In addition, there have been 141 reported instances of bullying at the schools during the 2011-2012 school year. During the 2011-2012, there were 25 instances of vandalism at school property which resulted in excess of \$5,700 of property damage. 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.

Workplace Violence

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

RISK: MODERATE

RANKING: 8TH

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.

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: MODERATE

RANKING: 10TH

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.

Economic Recession/Disaster

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

RISK: MODERATE

RANKING: 15TH

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 the United State's and world economies have not yet fully recovered (2014).

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 14.4 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: 19TH

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 of Michigan's 83 counties by the number of injuries causing death or incapacitation puts Delta at 53rd 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 2.3 accidents per million train miles in the United States in 2012. Derailments accounted for 74 percent of the accidents. The most common accident cause is attributable to human action (37%); 34 percent of the accidents resulted from track defects. Less than 3 percent of the accidents were caused by signal defects.

Statistics from the FRA report indicate almost 2,000 incidents at highway-rail crossings in 2012. These incidents resulted in 239 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 NewPage mill is not active. Some track, however, is used for car storage. The railroad provides local service to NewPage.

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. Passenger enplanements in 2012 totaled 25,363; air cargo totaled 1.05 million pounds. The airport property is designated as a business renaissance zone.

Vulnerability: There were 1,430 vehicle accidents in Delta County during 2011, with 65% involving a passenger car. The second most predominate type of vehicle was the pickup truck (23%). Trucks were involved in less than five (5%) percent of the crashes. The traffic crashes in 2011 resulted in seven fatalities and 222 persons injured. There were 1,255 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. Eleven percent of the crashes in 2011 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 over 22,000 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. One-third of the accidents were caused by human error and 42 percent caused by track defects. There were no fatalities or reported injuries. During the same period, there were 6 incidents at highway-rail crossings in the county, with no

fatalities or reported injuries.

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 |
| 1 Health Department | Public Health, Delta & Menominee Counties | 2920 College Ave., Escanaba |
| 16 Police/Fire Departments | Delta County Sheriff Department | 111 N. 3 rd St., Escanaba |
| | Escanaba Public Safety | 1900 3 rd Ave. N., Escanaba |
| | Gladstone Public Safety | 144 4 th Ave. NE., Gladstone |
| | Michigan State Police | 922 Lake Shore Dr., Gladstone |
| | Baldwin Twp. VFD | 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 | 24 th Rd., Rapid River |
| | Escanaba Twp. VFD | 4618 Co 416 20 th 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 |
| 4 Emergency Medical Services | Rampart EMS | 828 Sheridan Rd., Escanaba |
| | Masonville Twp. VFD | 10584 N. Main St., Rapid River |
| | Rock Community EMS | 14376 Hwy M-35, Rock |
| | Tri-Star EMS | 9425 00.25 Rd., Cooks |
| 2 Solid Waste Facilities | Delta County Landfill | 5701 19 th Ave., Escanaba |
| | Escanaba Paper Co. Landfill | 7100 Co Rd 426, Escanaba |
| 1 Prison/Jail Facility | Delta County Sheriff Department | 111 N. 3 rd St., Escanaba |
| Delta County Public Infrastructure | | |
| 6 Municipal Water Systems | Escanaba | 1 Water Plant Rd., Escanaba |
| | Gladstone | 22 Delta Ave., Gladstone |
| | Garden | 243 Garden Avenue, Garden |

| | | |
|--|--|---|
| | Nahma | Located at off of County Road 499 in the NE ¼, SW ¼, SE ¼, Sec 24, T40N, R23W |
| | Maple Ridge/Rock | 14639 Chapel Lane, Rock |
| | Ford River | Located off of L.15 Lane in the NW ¼, SE ¼ SW ¼ Sec. 15, T38N, R23W |
| | Riverside Manor | 10570 N. Main St., Rapid River |
| 4 Municipal Wastewater Systems | Escanaba | 1900 Willow Creek Rd., Escanaba |
| | Gladstone | 41 Minneapolis Ave., Gladstone |
| | Bark River | 1445 12 th Rd., Bark River |
| | Rapid River | 10574 N. Main Street, Rapid River |
| 5 Electrical Service Providers | Cloverland Electric Cooperative | 2916 W. M-28, Dafter |
| | Alger-Delta Cooperative Electric Association | 426 N. 9 th St., Gladstone |
| | City of Escanaba | 1711 Sheridan Rd., Escanaba |
| | UPPCO | 600 E. Lakeshore Dr., Ste. 206, Houghton |
| | Wisconsin Energies | 231 W. Michigan St., Milwaukee, WI |
| 1 Natural Gas Provider | DTE Energy/MichCon | 1 Energy Plaza, Detroit |
| 1 Commercial Airport | Delta County Airport | 3300 Airport Rd., Escanaba |
| 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 |
| 4 Telephone (landline) Service Providers | AT&T | 1034 N. Lincoln Rd., Escanaba |
| | Charter Communications | 401 N. 30 th St., Escanaba |
| | Hiawatha Telephone | 108 W. Superior St., Munising |
| | Century Link | 116 S. Maple St., Manistique |
| 3 Cell Phone Service Providers | Cellcom | 2354 10 th Street, Menominee |
| | Verizon | 314 N. Lincoln Rd., Escanaba |
| | AT&T | 1034 N. Lincoln Rd., Escanaba |
| 5 Internet Service Providers | DS Tech | 1431 N. 26 th St., #101, Escanaba |
| | Charter Communications | 401 N. 30 th St., Escanaba |
| | AT&T | 1034 N. Lincoln Rd., Escanaba |

| | | |
|--|-------------------------------|---|
| | UPLOGON | 1801 7 th Ave. N., Escanaba |
| | Merit Network | 1000 Oakbrook Dr., Ste. 200, Ann Arbor |
| Delta County Educational Facilities | | |
| 14 Public School Buildings | Escanaba Area Schools | Lemmer Elementary, 700 S. 20 th St., Escanaba |
| | | Soo Hill Elementary, 5219 18 th Rd., Escanaba |
| | | Webster Elementary, 1213 N. 19 th St., Escanaba |
| | | Escanaba Upper Elementary School, 1500 Ludington St., Escanaba |
| | | Escanaba Jr. High School, 500 S. Lincoln Rd., Escanaba |
| | | Escanaba Sr. High School, 500 S. Lincoln Rd., Escanaba |
| | Gladstone Area Schools | Cameron Elementary, 803 29 th St., Gladstone |
| | | J. T. Jones Elementary, 400 S. 10 th St., Gladstone |
| | | Gladstone Middle School, 300 S. 10 th St., Gladstone |
| | | Gladstone Area High School, 2100 M-35, Gladstone |
| | Bark River-Harris Schools | Elementary, Jr. and Sr. High School, US-2, Harris |
| | Mid-Peninsula Schools | K-12 School, 5055 St. Nicholas 31 st Rd., Rock |
| | Rapid River Public Schools | K-12 School, 10070 US-2, Rapid River |
| | Big Bay de Noc School | K-12 School, 8928 00.25 Rd., Cooks |
| 2 Private Schools | Escanaba SDA Christian School | 210 S. Lincoln Rd., Escanaba |
| | Holy Name Catholic School | 409 S. 22 nd St., Escanaba |
| 1 Alternative Education | Bay Middle College | 2001 N. Lincoln Rd., Escanaba |
| 3 Head Start Centers | Escanaba | 507 1st Ave. N. Escanaba |
| | Gladstone | 207 S. 12 th St., Gladstone |
| | Rapid River | 10070 US-2, Rapid River |
| 1 Vocational Education | Delta-Schoolcraft ISD | 100 N. Cedar St., Manistique |
| 1 Post-Secondary Education | Bay de Noc Community College | 2001 N. Lincoln Rd., Escanaba |

| Extremely Hazardous Materials (302 Sites) | | |
|---|----------------------------|---|
| 11 Hazardous Materials Sites | Ameritech | 10483 Wisconsin Ave. Rapid River |
| | Ameritech | Co.Rd. 426, Cornell |
| | Ameritech | 1005 1 st Ave. S., Escanaba |
| | Ameritech | Delta & 12 th St., Gladstone |
| | Bay Area Pool & Spa | 6699 US-2&41/ M-35, Escanaba |
| | AT & T Perkins (MI2050) | .9 Miles S. of Perkins on St. |
| | Bark River CDO/ Mich. Bell | Co. Rd. 535, Bark River |
| | NewPage | Co. Rd.426, Escanaba |
| | Ray's Feed Mill | 1076 Old Hwy 2 & 41, Bark River |
| | John Thill/ Farm | 18 th Rd., Garden |
| | John Thill/ Farm | M-183, Garden |

| 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 |

| Identified Hazard | Affected/Vulnerable Facilities & Infrastructures |
|---|---|
| Flooding | Water systems, Wastewater systems, Governmental buildings, Bridges, Roadways, and Railroads |
| Petroleum 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/ disaster | All facilities and infrastructure |
| Public health emergencies, bioterrorism | All facilities and infrastructure |

3.5 Declared Disasters in Delta County

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

| 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* |

*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, <http://www.fema.gov/disasters>

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.

During the planning process for the 2007 Hazard Mitigation Plan, Escanaba Township had a concern with the rail switching yards being currently located near a major highway and densely populated area; it was suggested the yards be moved to a rural site. The LEPC discussed the suggested strategy and felt that it was already addressed in another strategy dealing with hazardous materials transportation. The specific strategy of moving the switching yards is not stated in this plan. Additionally, two townships have had concerns regarding the response to clearing ice jams on county rivers. The strategy was discussed and evaluated by the LEPC, but the committee felt that attempting a response through a regulatory agency's regulatory process may well create a hindrance to providing the quick response needed to address ice jams.

During discussions of the 2014 Update to the Hazard Mitigation Plan, the LEPC revisited the issues and strategies. Some new strategies were added in order to improve the community's ability to mitigate hazards. These new strategies are ranked separately (see 4.3) in order to distinguish between the original strategies and those added in 2014.

4.1 Issues, Goals, and Strategies

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. NOAA weather radio coverage is absent in a large section of northeastern 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 and increase coverage of the NOAA Weather radio tower.

- Increase use of NOAA Weather Radio 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.

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 14 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 NewPage paper mill, several years ago, 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 20,214 housing units in the county, with over half (54.0 %) 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 six percent 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.

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.

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 presently conducting a coastal flood study of the Great Lakes to determine coastal flood hazards 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 (MDEQ 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.

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.

| <p style="text-align: center;">Table 4-1 Evaluation Criteria</p> | <p style="text-align: center;">Points</p> |
|--|--|
| <p>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).</p> | <p style="text-align: center;">25 - 15 - 5</p> |
| <p>The project/alternative mitigates a recurring problem.</p> | <p style="text-align: center;">20</p> |
| <p>The project/alternative is intended to reduce property damage to structures community-wide.</p> | <p style="text-align: center;">15</p> |
| <p>The project/alternative is intended to reduce property damage to selected areas of a community.</p> | <p style="text-align: center;">10</p> |
| <p>The project/alternative is cost effective for the community.</p> | <p style="text-align: center;">20</p> |
| <p>The project/alternative can be implemented using only local resources (100% local resources, less than 100%)</p> | <p style="text-align: center;">10 - 5</p> |
| <p>The cost of the project/alternative does not exceed the anticipated cost of probable damage (if an event occurs).</p> | <p style="text-align: center;">5</p> |
| <p>The project/alternative is intended to protect the area's natural resources. (forests, surface water, etc.)</p> | <p style="text-align: center;">5</p> |

2014 Update

The LEPC reviewed these strategies to determine if the strategies are still valid. The LEPC also examined and reviewed new strategies and scored them using the established evaluation criteria presented above. The LEPC is composed of utility, medical profession, volunteer services, ambulance service, and private industry representatives, and the emergency management coordinator. At meetings held November 14, 2014, January 16, 2014, and March 20, 2014, the Committee reviewed the existing strategies and discussed in depth and scored new strategies using the criteria described above. During the hour long plus meetings, each of the new strategies were discussed with members presenting their own viewpoint and relating how the county could be impacted by the strategy. A consensus was reached among the committee members of the overall score for each individual strategy.

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 | 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 locations to alleviate the situation and/or install appropriate traffic controls. | 90 |
| 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 |

| Table 4-2 Strategies by Rank Score | Points |
|---|---------------|
| 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 critical roadway segments. | 60 |
| 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 update of the Plan.

| Table 4-3 New Strategies To Be Included in the 2014 Update Hazard Mitigation Plan | Points |
|---|---------------|
| Increase public awareness of the need for permits (MDEQ 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 |

| Table 4-3 New Strategies To Be Included in the 2014 Update Hazard Mitigation Plan | Points |
|--|---------------|
| 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 |
| 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 |

4.4 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 ordinance. 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 townships of Brampton, Ensign, Fairbanks, Bay de Noc, Ford River, garden, Masonville Nahma and Wells have enacted a subdivision control ordinance.

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 of 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 are 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. Escanaba and Gladstone 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. Four federal funding sources for hazard mitigation and emergency preparedness are:

- HMGP: Hazard Mitigation Grant Program
- PDM: Pre-Disaster Mitigation Program
- FMA: Flood Mitigation Assistance Program
- EMPG: Emergency Management Performance Grants
- *SRL: Severe Repetitive Loss
- *RFC: Repetitive Flood Claims

* The Biggert Waters Flood Insurance Reform Act of 2012 eliminated the SRL and RFC programs beginning in FY 2013.

Other funding sources noted in this chapter are:

- HMG: Hazardous Materials Grant Program
- HMEP: Hazardous Materials Emergency Planning Grant
- HSGP: Homeland Security Grant Program
- AFG: Assistance to Firefighters Grant Program
- USDA-RD: USDA Rural Development

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 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.

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

Action: Develop/update site emergency plans for SARA Title III sites.

Lead Agency: County Emergency Management

Funding Source: Local Resources, EMPG, LEPC

Time Frame: On going

Status: Plans updated for several sites.

Action: Regularly conduct exercises of site emergency plans and community response plans.

Lead Agency: County Emergency Management

Funding Source: Local Resources, EMPG

Time Frame: On going

Status: Exercises conducted at least two times per year.

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: On going

Status: County Road Commission and municipal departments of 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: On-going

Status: Agencies regularly conduct training sessions.

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: On-going

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.

Action: Continue to train and equip local hazardous materials emergency response teams.

Lead Agency: County Emergency Management

Funding Source: PDMP, HMGP, EMPG, HHSP

Time Frame: On-going

Status: Region 8 Homeland Security Planning Board is in discussing the possibility of forming a regional hazardous materials response team.

Action: Maintain facility and community training and exercise programs.

Lead Agency: County Emergency Management

Funding Source: Local Resources, EMPG

Time Frame: On-going

Status: Facility training programs have been implemented.

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 systems has been developed.

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: On-going

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 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: On-going

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: On-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: On-going

Status: There is no emergency warning system in place.

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: On-going

Status: Program in planning stage.

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: On-going

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: On-going

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: On-going

Status: The plans for some facilities have been prepared.

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 built.

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.

Action: Purchase and distribute NOAA radios.

Lead Agency: County Emergency Management

Funding Source: HMGP

Time Frame: On-going

Status: Program in planning stage.

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 system is 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: On-going

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: On-going

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.

Action: Install signs along the highway to denote the actual speed of vehicles traveling on the roadway.

Lead Agency: MDOT

Supporting Agency: Local Unit 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: On-going

Status: There is 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: On-going

Status: Utility company tree trimmers ensure power line safety and reliability.

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 aware of several sites, but no formal inventory has been completed.

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: On-going

Status: In progress.

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: On-going

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: On-going

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 has been consulted about developing a response system.

2014 Strategies

Action: Increase public awareness of the need for permits (MDEQ Part 31) for building in flood plain areas.

Responsible Agency: County Board, Local Units of Government

Funding Source: Local Resources

Time Frame: On-going

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: On-going

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

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: On-going

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: On-going

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: On-going

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: On-going

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: On-going

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: On-going

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: On-going

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: On-going

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

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: On-going

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: On-going

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: On-going

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: On-going

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: On-going

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: On-going

Action: Institute public education of flood warning systems.

Responsible Agency: County Emergency Management

Funding Source: Local Resources

Time Frame: On-going

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: On-going

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: On-going

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: On-going

Action: Institute a public education program regarding emergency flood warning systems.

Responsible Agency: County Emergency Management

Funding Source: Local Resources

Time Frame: On-going

Action: Improve/update accurate flood plain mapping of communities.

Responsible Agency: Local Units of Government

Funding Source: Local Resources

Time Frame: On-going

5.1.2 Administration 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.

**Table 5-1
Summary of Actions and Responsible Parties**

| | *Improve/Expand Warning Systems/ Install signage | *Increased NOAA weather coverage | Public Education | Plans, Studies, and/or Mapping | Training and Education | *Construct/ upgrade emergency shelters | *Equipment for emergency response and public works personnel | Road improvements | *Purchase distribute weather radio | Adopt Plan and consider hazard mitigation in local planning/zoning |
|------------------------------------|--|----------------------------------|------------------|--------------------------------|------------------------|--|--|-------------------|------------------------------------|--|
| County Board | | | | | | | | | | X |
| County Emergency Management | X | X | X | X | X | X | X | X | X | |
| Local Emergency Planning Committee | | | X | | | | | | X | |
| Law Enforcement | X | | | | X | | | | X | |
| Fire Service | | | | | X | | X | | X | |
| Emergency Medical Services | | | X | X | X | | X | | | |
| Public Health | | | | X | X | | X | | | |
| Human Services | | | | X | | | | | | |
| MDOT | X | | | X | | | | 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 |
| Brampton Twp. | X | X | | X | | | X | | X | X |
| Cornell Twp. | X | X | | X | | | X | | X | X |
| Ensign Twp. | X | X | | X | | | X | | X | X |
| Escanaba City | X | X | | X | | | X | X | X | X |
| Escanaba Twp. | X | X | | X | | | X | | X | X |
| Fairbanks Twp. | X | X | | X | | | X | | X | X |
| Ford River Twp. | X | X | | X | | | X | | X | X |

| | *Improve/Expand Warning Systems/ Install signage | *Increased NOAA weather coverage | Public Education | Plans, Studies, and/or Mapping | Training and Education | *Construct/ upgrade emergency shelters | *Equipment for emergency response and public works personnel | Road improvements | *Purchase distribute weather radio | Adopt Plan and consider hazard mitigation in local planning/zoning |
|------------------|--|----------------------------------|------------------|--------------------------------|------------------------|--|--|-------------------|------------------------------------|--|
| Garden Twp. | X | X | | X | | | X | | X | X |
| Garden Village | X | X | | X | | | X | | X | X |
| Gladstone city | X | X | | X | | | X | X | X | X |
| Maple Ridge Twp. | X | X | | X | | | X | | X | X |
| Masonville Twp. | X | X | | X | | | X | | X | X |
| Nahma Twp. | X | X | | X | | | X | | X | X |
| Wells Twp. | X | X | | X | | | X | | X | X |

*FEMA fundable grant project

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, and Updating

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. 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) in February of 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. Table 4-2 depicts the zoning authority of individual governmental entities in Delta County.

| Table 4-2 Planning and Zoning Authorities | | |
|--|----------------------------|---------------------|
| Local Government | Delta County Zoning | Local Zoning |
| Baldwin Township | X | |
| Bark River Township | | X |
| Bay de Noc Township | X | |
| Brampton Township | X | |
| Cornell Township | X | |
| Ensign Township | X | |
| Escanaba City | | X |
| Escanaba Township | | X |
| Fairbanks Township | X | |
| Ford River Township | | X |
| Garden Township | X | |
| Gladstone city | | X |
| Maple Ridge Township | X | |
| Masonville Township | | X |
| Nahma Township | X | |
| Wells Township | X | |
| Village of Garden | | X |

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 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.

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. Public review of the update to the Delta County Hazard Mitigation Plan was achieved through the following:

- A letter was sent notifying local governments within Delta County, neighboring counties and members of the LEPC that the County Board has adopted the plan.
- A copy was made available for public review at the Escanaba and Gladstone public libraries, the Escanaba and Gladstone Public Safety Departments, and the Delta County Courthouse.
- A notice was placed in the local newspaper informing the public on where they could review the plan and the time and location of public meetings. The public was encouraged to send comments to the Emergency Management Coordinator.

- The County Emergency Management Coordinator arranged to have hazard mitigation information displayed on the County, CUPPAD Regional Commission or other organizations' websites. Local officials and residents alike could easily access this type of media.