Mason County
Community Wildfire Protection Plan

2016

WEST MICHIGAN SHORELINE
REGIONAL DEVELOPMENT COMMISSION

WEST MICHIGAN SHORELINE
REGIONAL DEVELOPMENT COMMISSION
(WMSRDC)

The WMSRDC is a regional council of governments representing 120 local governments in the West Michigan counties of Lake, Mason, Muskegon, Newaygo, Oceana, and northern Ottawa.

The mission of WMSRDC is to promote and foster regional development in West Michigan… through cooperation amongst local governments.

WMSRDC
WEST MICHIGAN SHORELINE
REGIONAL DEVELOPMENT COMMISSION

Project Staff:

Stephen Carlson, Senior Planner
Jamie Way, GIS Specialist

This plan was prepared by WMSRDC in conjunction with Mason County Emergency Management Office, Mason County Fire Departments, Michigan Department of Natural Resources, and United States Forest Service.

TABLE OF CONTENTS

EXECUTIVE SUMMARY

With large areas of State and National forests, lake and streamside communities, numerous woodlots, and extensive Lake Michigan frontage, Mason County has many areas that are at significant risk from wildfire. As a first step towards reducing wildfire risk, Mason County Emergency Management, in cooperation with the Mason County Rural Fire Authority, secured a grant from the Michigan Department of Natural Resources to develop a Community Wildfire Protection Plan (CWPP). The grant was used to convene local, state and federal stakeholders and develop the Mason County Community Wildfire Protection Plan, which evaluates wildfire risk, areas of concern, and firefighting resources and limitations, and identifies priority actions.

The information and maps contained within this plan are intended to educate property owners and local officials about wildfire risks in Mason County and suggest development and property maintenance practices that can reduce the impacts of wildfire. The plan should be used to help identify the most effective and cost-efficient projects for wildfire mitigation in Mason County. In addition, it is expected that this plan will help qualify agencies and local governments within Mason County for funding to implement those projects. This plan must be updated, at most, every five years to ensure that priorities remain consistent with the community's needs and so that funding may be pursued to address those needs.

This plan was developed with the assistance of the West Michigan Shoreline Regional Development Commission under the guidance of the Healthy Forest Restoration Act of 2003 (HFRA). It represents the efforts and cooperation of a wide range of organizations and agencies working together to improve the preparedness for wildfire events in Mason County while reducing factors of risk.

The HFRA requires that three entities mutually agree to the final contents of a CWPP:
- The applicable city or county government;
- The local fire department(s); and
- The state entity responsible for forest management.

The signatures below signify the three entities' mutual agreement of the contents of this CWPP.

Signature:	Signature:
Name: Date	Name: Date
Title:	Title:
Representing:	Representing:
Signature:	Signature:
Name: Date	Name: Date
Title:	Title:
Representing:	Representing:
Signature:	Signature:
Name: Date	Name: Date
Title:	Title:
Representing:	Representing:

I. BACKGROUND & PLANNING PROCESS

A. INTRODUCTION

In 2003 President George W. Bush signed the Healthy Forest Restoration Act (HFRA) into law. The act represents a significant federal effort to encourage cities, townships, and counties to develop wildfire plans with federal support. The HFRA encourages communities to develop fire plans in coordination with state and federal fire managers with intense community-level participation. The intention was to create plans that "Prioritize and refine [the communities] priorities for the protection of life, property, and critical infrastructure in the wildland urban interface (WUI)." In order to utilize the HFRA, communities have taken the act and developed a process for plan creation. The process affects who collaborates, how collaboration takes place, and increases the influence homeowners have in the planning process. The final result is a community wildfire protection plan (CWPP).

The purpose of a community wildfire protection plan is to engage communities, gather public input, and represent the community's voice when fire management decisions are made at the state and federal level. The coordinated fuels reductions projects include state and federal lands to affect the safety of entire communities down to the neighborhood level. The CWPP is a plan that also allows for cohesive community wide fuel reduction projects with community participation and support.

In February of 2015, the Mason County Rural Fire Authority was awarded a grant for $18,000 for the preparation of a CWPP for Mason County. The funds were authorized and awarded by the Michigan Department of Natural Resources. Mason County Emergency Management coordinated with the West Michigan Shoreline Regional Development Commission (WMSRDC) to lead the planning process, conduct meetings, collect local input, and author the plan.

B. PURPOSE AND SCOPE

This plan has been designed to meet and exceed the requirements of the Healthy Forest Restoration Act (HFRA) of 2003. The minimum requirements for a CWPP as described in the HFRA are:

1) **Collaboration**: A CWPP must be collaboratively developed by local and state government representatives, in consultation with federal agencies and other interested parties.
2) **Prioritized Fuel Reduction**: A CWPP must identify and prioritize areas for hazardous fuel reduction treatments and recommend the types and methods of treatment that will protect one or more at-risk communities and essential infrastructure.
3) **Treatment of Structural Ignitability**: A CWPP must recommend measures that homeowners and communities can take to reduce the ignitability of structures throughout the area addressed by the plan.

In addition to the content and collaboration requirements, the HFRA requires that the applicable local government, the local fire department, and the state entity responsible for forest management agree to the final contents of the plan. The HFRA also recommends that the United States Forest Service (USFS) and United States Bureau of Land Management (BLM) be invited to participate in the development of the plan.

This plan is intended to provide context for the conclusions and priorities that were identified during the planning process. Analysis of existing conditions and projection of future conditions of the landscape in Mason County are intended to educate and influence the people of the community to prepare against the threats associated with wildland fire. Lastly, the conclusions and priorities of this plan are intended to influence resource allocation and planning in the context of preparations for fire-related emergencies.

C. PLANNING PROCESS

The planning process used in the creation of this plan was sourced and recommended by two handbooks. They were created to aid communities in the creation of CWPP in a way that is collaborative and comprehensive; in a manner that meets the requirements of the HFRA and is unique to the community. The *Community Guide to Preparing and Implementing a Community Wildfire Protection Plan (August 2008),* is a supplement to the handbook, *Preparing a Community Wildfire Protection Plan "A Handbook for Wildland Urban Interface Communities" (March 2004)*. Both documents were produced through multiple partners including the Communities Committee, National Association of State Foresters, Society of American Foresters, and the Western Governors' Association.

These two documents outline an approach to the creation of a CWPP that engages stakeholders and produces a community-involved plan. The planning process is broken down into steps that produce a comprehensive wildfire protection and response plan. These steps follow a logical progression in plan development and provide the framework for meetings and meeting content, thus guiding the community input and public feedback aspects of plan creation.

Step One: Convene Decision Makers

This is the initial step in developing the CWPP and involves the creation of a core team representing local government, local fire authorities, and the state fire management agency. This group forms the decision making responsibility and members must agree to the plan's contents.

Step Two: Involve Federal Agencies

Once the core team is formed they will engage local representatives of the USFS, BLM, and other federal agencies to share perspectives and information that are part of the planning process.

Step Three: Engage Interested Parties

The core team effectively engages all interested stakeholders into the planning process, in a manner leading to substantial input from community that represents and reflects the community's priorities. This step also aides in the implementation of the recommended projects.

Step Four: Establish a Community Base Map

The core team and stakeholders use the best available technology combined with local expertise to develop a base map of the community. The base map provides a baseline to assess and make recommendations regarding protection and risk reduction priorities. The base map should identify developed areas, critical infrastructure, and provide the basis for the designation of the wildland urban interface.

Step Five: Develop a Community Risk Assessment

The risk assessment helps stakeholders and the core team effectively prioritize areas for treatment and identify the best allocation of resources.

Step Six: Establish Community Hazard Reduction Priorities and Recommendations to Reduce Structural Ignitability

This step provides the basis for essential discussion regarding the results of the fire risk assessment and its impact on local protection and prevention needs. This leads to the prioritization of fuel treatment projects across property boundaries.

Step Seven: Develop Action Plan and Assessment Strategy

This step involves the core team and key community partners in the development of a prioritized actionable list of fire mitigation projects the community wishes to consider.

Step Eight: Finalize the Community Wildfire Protection Plan

Following the collaborative development process of the plan and a brief public comment period, the plan's contents are agreed upon by the core team and supported by the local unit of government. All comments are considered and changes to the draft are proposed and discussed by the steering committee.

E. WILDFIRE ADVISORY GROUP

Step one of the planning process initiated contact between the local, federal, regional, and state levels to create a framework for the planning process. In July of 2015, a core group comprised of representatives from each of the eleven fire districts in Mason County, Mason County Emergency Management, USFS, MDNR, and WMSRDC was formed to initiate the planning process. This "wildfire advisory group" oversaw the creation, contents, and the eventual adoption of the plan. Five meetings of the group were held between July of 2015 and July of 2016. These meetings were organized by Mason County Emergency Management and facilitated by WMSRDC. In addition, the Advisory Group hosted a local stakeholder meeting in June 2016 to discuss the CWPP planning process and offer stakeholders an opportunity to review the first draft of the Mason County CWPP.

F. PLAN PRIORITIES

The four goals presented below were crafted to meet the minimum requirements of a CWPP, and to ensure the plan meets the wildfire needs of Mason County. These goals provide a framework for the proposed actions contained within this plan.

MASON COUNTY CWPP GOALS

1. **Mitigate Accidental Ignitions**
2. **Reduce Catastrophic Fire Potential**
3. **Fortify Existing Structures and Infrastructure**
4. **Support Fire Suppression and Emergency Response Capabilities**

II. COMMUNITY PROFILE

A. OVERVIEW

Mason County is located in the western part of Michigan's Lower Peninsula. The county borders Manistee County to the north, Lake County to the east, Oceana County to the south, and Lake Michigan to the west. The county has a land area of about 511 square miles, which notably includes areas of the Manistee National Forest, Ludington State Park, and sand dunes along Lake Michigan. The county has a total water area of 3,245 acres and about 30 miles of Lake Michigan coastline. There are numerous recreational opportunities in the Manistee National Forest and Ludington State Park, as well as other outdoor recreation opportunities such as hunting, fishing, boating, paddling, hiking, and sightseeing.

Since 1940, Mason County has generally experienced a population growth rate of less than 10% every ten years. Notable exceptions include a 16.6% increase in 1980; a 3.1% decrease in 1990; and a 10.7% increase in 2000. The county had a U.S. Census population in of 28,705 in 2010. The seasonal population is estimated to much greater at times during the summer season due to an influx of visitors to the area. Mason is a mainly rural county; about one-third of the population resides within one of the county's five incorporated communities. Additional concentrations of development are common in communities close to Lake Michigan and surrounding inland lakes. Just over half of the county's population lives in one of the five municipalities that lie adjacent to Lake Michigan.

In terms of ethnicity, the 2010 population consisted of 27,225 White, 172 Black or African American, 289 American Indian or Alaskan Native, 132 Asian, 1,150 Hispanic or Latino, 547 "two or more" races, and 340 "some other" race. In 2010, there were 17,293 total housing units with 11,940 (69%) occupied and 5,353 (31%) vacant. About three-quarters of vacant housing units were "For seasonal, recreational, or occasional use." Per capita income in 2010 was $25,681 and median household income was $48,411.

B. HISTORY

Mason County's recorded history dates back to the mid-1600's when French missionaries, including Father Pere Marquette, visited the Ottawa Indians. As the earliest inhabitants of the area, these Native Americans had established an estimated 52 villages. Fur trading was commercially prominent from the 1600's to the 1840's, a period when the population of Native Americans diminished. Father Marquette died on the south side of the mouth of the Pere Marquette River in 1675. (A memorial marking his death stands there.)

Mason County was established in 1855 by legislation that separated it from Ottawa County. Mason County was divided into three townships: Free Soil, Little Sable, and Pere Marquette.

When these divisions were made, the Lincoln, Big Sable, and Pere Marquette Rivers were used as boundaries. In 1873, Ludington was named the county seat. The county was named after Steven T. Mason, who was twice elected Governor after Michigan's admission to the Union in 1837.

In the mid-1840's, the first white settlers began to arrive in the area. Burr Caswell, a fur trader, built the first wood-frame house in the area. He later became the first probate judge of the county. After the 1850's, the fur trade was replaced by the lumber industry as the area's economic base. Lumbermen such as James Ludington followed and sawmills, along with the discovery of salt, caused the area's boom in the late 1800's. In 1897, the Pere Marquette Railroad built a fleet of ferries to transport lumber. Agriculture and commerce were established as the population increased. By the early 1900's, the lumber industry became less economically important and was gradually replaced by light manufacturing, a chemical industry, and water-related recreation activities.

Historic Sites in Mason County

National Register of Historic Places

- Big Sable Point Light Station, Hamlin Township
- Lake Michigan Beach House, Hamlin Township
- Ludington North Breakwater Lighthouse, Ludington
- Ludington United States Coast Guard Station, Ludington
- Mason County Courthouse, Ludington
- Not-A-Pe-Ka-Gon Site, Custer Township
- S.S. Badger (carferry), Ludington
- Scottville School, Scottville
- William A. and Catherine Cartier House, Ludington

Michigan State Historic Sites

- Armistice Day Storm Informational Designation, Strearns Park, Ludington
- Camp Arcadia, 5990 Barnhart Road, Hamlin Township
- Emanuel Evangelical Lutheran Church of Ludington, 501 Danaher Street, Ludington
- First Mason County Courthouse, South Lakeshore Drive
- Ghost Town of Hamlin Informational Site, Ludington State Park, M-116, Hamlin Township
- Daniel W. Goodenough House, 706 East Ludington Avenue, Ludington
- Frank N. and Fannie Allen Latimer House, 701 Ludington Avenue, Ludington
- Ray Lessard House, 110 North Lavinia Street, Ludington
- Marquette's Death Informational Site, Pere Marquette Park, Pere Marquette Township
- Reorganized Church of Jesus Christ of Latter Day Saints, 2579 Free Soil Road, Free Soil
- S.S. Pere Marquette 18 Informational Site, Stearns Park, Ludington
- Scottville Informational Designation, Downtown Pedestrian Mall, Scottville

C. ECONOMIC BASE

According to the Mason County Master Plan, the county's economic base is very diversified. A major contributing sector is the manufacturing industry, which employed 1,813 persons (14% of the labor force) as of 2010. The retail trade industry employed 1,400 persons (11% of the labor force). The third largest employment sector was the health care and social assistance field which employed 1,250 persons (9.8% of the labor force). Most of these economic activities are located in the western half of the county between the cities of Ludington and Scottville and near the US -10 corridor.

Mason County Agriculture
Top Crop Items
Corn for grain
Forage-land used for all hay and haylage, grass silage, and greenchop
Soybeans for beans
Wheat for grain
Winter wheat for grain
Top Livestock Inventory Items
Cattle and calves
Hog and pigs
Layers
Sheep and lambs
Colonies of bees

Source: 2012 Census of Agriculture

D. AGRICULTURE

According to the 2012 Census of Agriculture, over 79,000 acres of land were held by farms in Mason County (this figure includes both land involved in crop production and areas on the farm property such as woodlots, wetlands, etc.). In other words, about one-quarter of Mason County is farmland. In general, agricultural lands lie along the southwest and central areas of the county, skirting the more populated and developed areas of Ludington and Scottville.

D. LAND COVER & VEGETATION

Forested land is the most common land cover in Mason County. According to 2011 land cover data, over half of the county is covered by any combination of deciduous forest, evergreen forest, mixed forest, and woody wetlands.

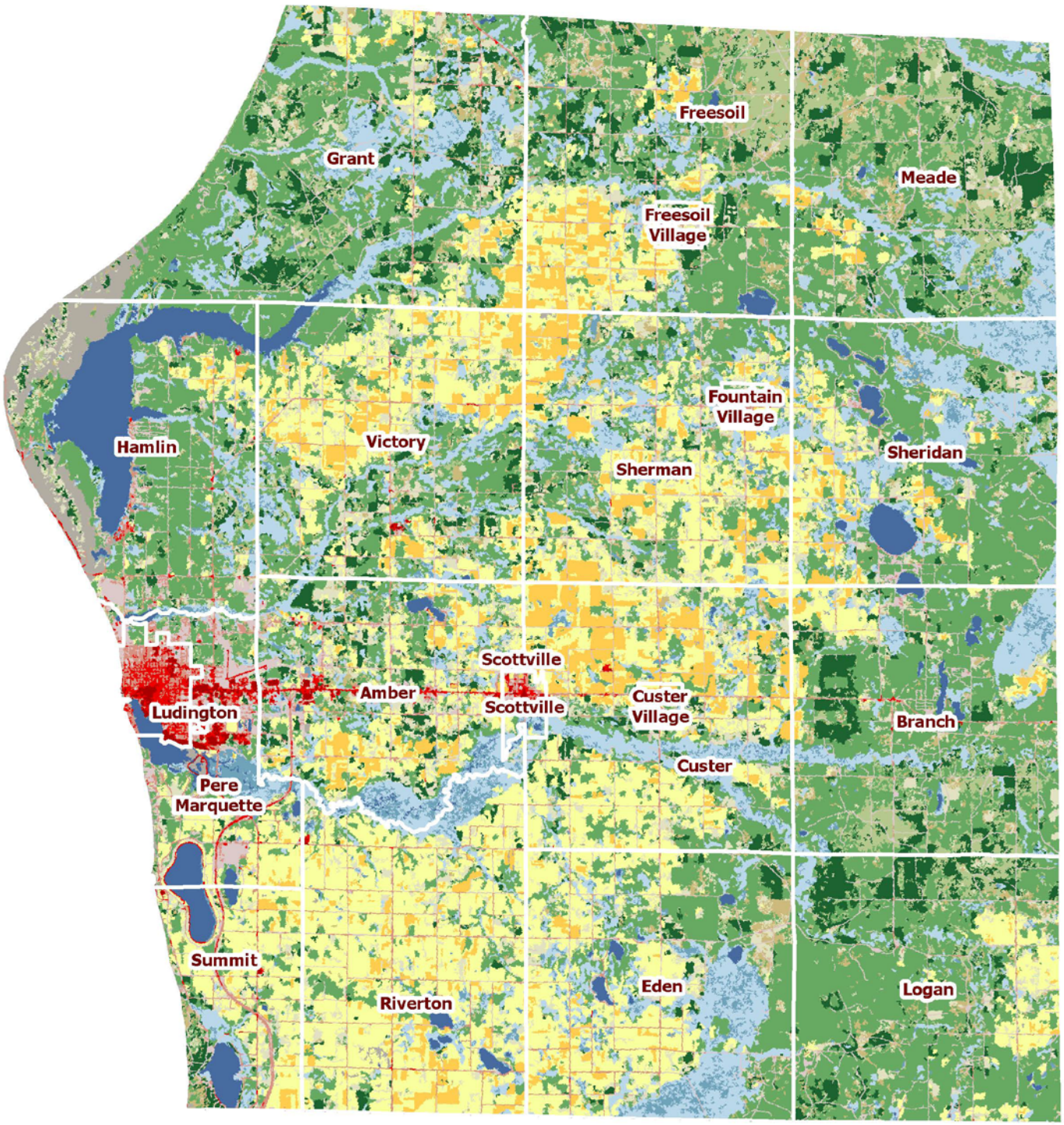
The single most common land cover type is deciduous forest, which covers about 29% of the county. These areas are primarily situated along the eastern, northern, and northwestern fringes of the county. The second most prevalent land cover type is cultivated crops, which make up about 18% of the total. Woody wetlands is the third most prevalent land cover type, covering about 12% of the total land area.

High, medium, and low intensity development types account for only about 3% of the total land cover, and are most prevalent in the county's cities, villages, and urbanized areas along the US 31/US 10 corridor. Notable densities are also identifiable along the shores of Lake Michigan and many inland lakes.

Land Cover Type	%
Open Water	3.02
Developed, Open Space	4.86
Developed, Low Intensity	2.18
Developed, Med. Intensity	0.65
Developed, High Intensity	0.25
Barren Land	1.34
Deciduous Forest	28.84
Evergreen Forest	6.60
Mixed Forest	4.80
Shrub/Scrub	2.76
Herbaceous	7.07
Hay/Pasture	5.28
Cultivated Crops	17.71
Woody Wetlands	11.95
Emergent Herbaceous Wetlands	2.70

Percentages calculated by WMSRDC.
Source: MRLC NLCD Database, 2011

Mason County
2011 Land Cover



NLCD Land Cover Classifications

- Woody Wetlands
- Shrub/Scrub
- Open Water
- Mixed Forest
- Developed, Open Space
- Developed, Medium Intensity
- Developed, Low Intensity
- Developed, High Intensity
- Herbaceuous
- Hay/Pasture
- Evergreen Forest
- Emergent Herbaceuous Wetlands
- Deciduous Forest
- Cultivated Crops
- Barren Land

WMSRDC
WEST MICHIGAN SHORELINE REGIONAL DEVELOPMENT COMMISSION

Map created on 09/01/2015
For general planning purposes only.
Sources: MRLC NLCD and MiGDL.

E. POPULATION DISTRIBUTION

The permanent population of Mason County is concentrated in the western half towards the Lake Michigan shoreline. The City of Ludington claims over one-quarter of the total county population; over half reside within municipalities along the Lake Michigan shoreline; and about three-quarters reside within the western half of the county. In the eastern half of the county, small population concentrations are found in the villages of Custer, Free Soil, and Fountain, as well as around inland lakes. Seasonal population increases are common throughout the county, especially along the Lake Michigan shoreline and around inland lakes and streams.

E. HOUSING

The is a wide variety of housing types in Mason County; from urban neighborhoods and apartment buildings, to isolated houses nestled in hard to access areas such as coastal sand dunes and inland forests.

With 31 percent of the housing units "vacant," it would appear that there is a surplus of housing with respect to the permanent population. However, 75 percent of those units are considered "vacant for seasonal, recreational, or occasional use." According to the 2010 Census, there were over 4,000 of these units in Mason County.

Over 22 percent of the housing stock was constructed prior to 1940, and nearly 27 percent was built in 1990 or later.

Mason County - Housing	#	%
Total housing units	17,293	100.0
Occupied housing units	11,940	69.0
Vacant housing units	5,353	31.0
For rent	287	5.4
Rented, not occupied	20	0.4
For sale only	385	7.2
Sold, not occupied	88	1.6
For seasonal, recreational, or occasional use	4,051	75.7
All other vacants	522	9.7

Source: U.S. Census, 2010

Mason County - Year Structure Built	#	%
Total housing units	17,259	100
Built 2010 or later	123	0.7
Built 2000 to 2009	2,276	13.2
Built 1990 to 1999	2,286	13.2
Built 1980 to 1989	1,878	10.9
Built 1970 to 1979	2,800	16.2
Built 1960 to 1969	1,422	8.2
Built 1950 to 1959	1,745	10.1
Built 1940 to 1949	915	5.3
Built 1939 or earlier	3,814	22.1

Source: ACS 2010-2014 5-Year Estimates

F. WATER FEATURES

Mason County has about 14,500 acres of lakes and ponds, more than 200 miles of rivers, and about 28 miles of Lake Michigan shoreline. The lakes are in scattered areas throughout the county. They range from 5 to 4,990 acres in size. Some lakes are in marshes and exhibit all stages of filling by vegetation. The largest lakes are Hamlin Lake (4,990 acres), Round Lake (571 acres), Pere Marquette Lake (554 acres), and Bass Lake (524 acres). Additionally, the Ludington pump-storage reservoir is more than 800 acres. Pere Marquette Lake offers recreational and commercial boating access to Lake Michigan.

The major rivers are the Pere Marquette River, the Lincoln, and the Big Sable, all of which flow westward to Lake Michigan. The Big Sable River drains the northern part of the county and enters Hamlin Lake before emptying into Lake Michigan. The Lincoln River and its two branches drain the central part of the county into Lincoln Lake. The Pere Marquette River and its south branch drain the southern part of the county into Pere Marquette Lake, through Port Ludington, and finally into Lake Michigan.

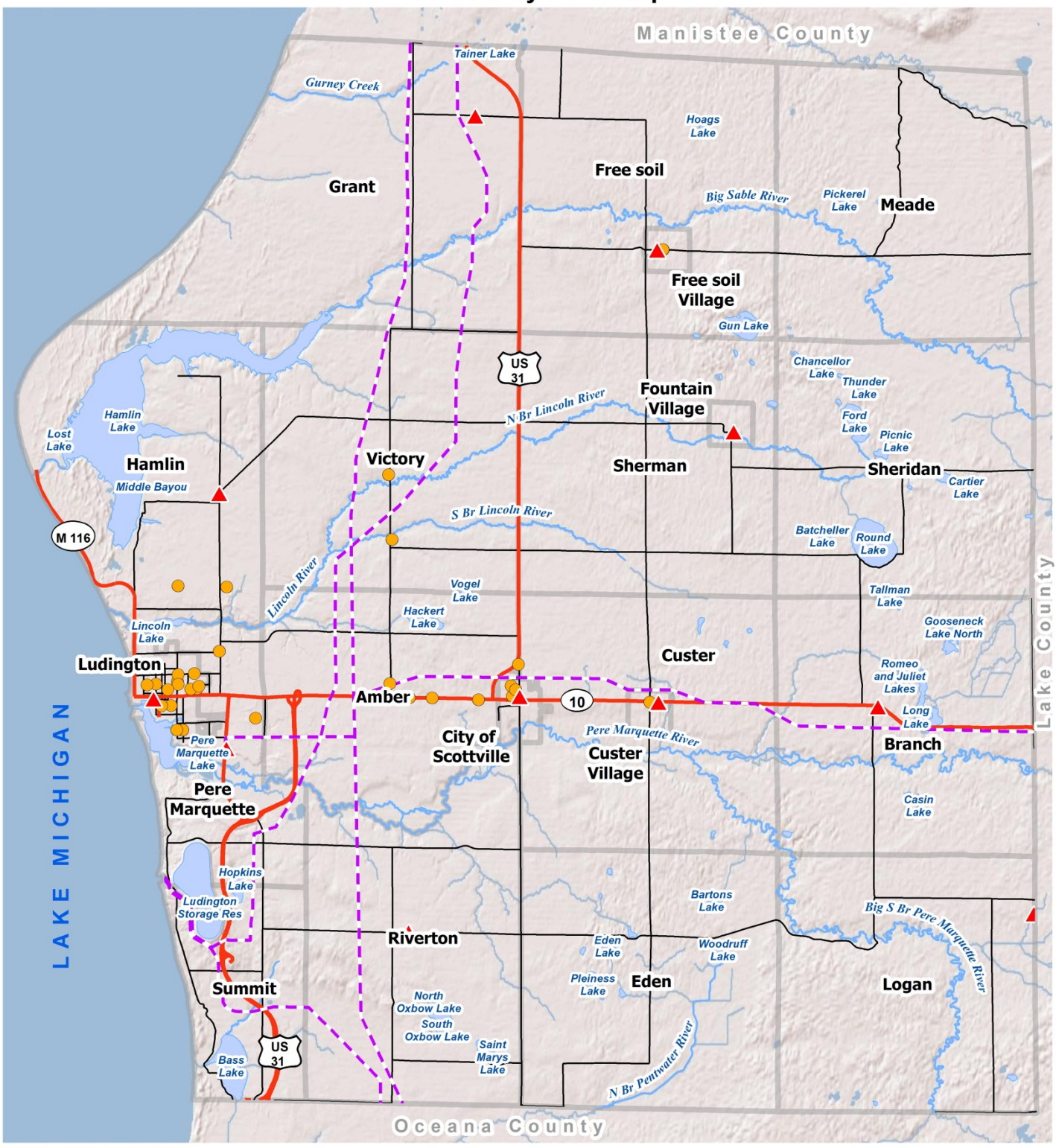
G. CLIMATE

The major climatic variations in the county are primarily the result of differences in topography and the proximity to Lake Michigan. Temperature extremes along the lakeshore are generally mitigated by the lake, keeping shoreline areas cooler in the summer and warmer in the winter. In addition, the shoreline is more likely to see greater amounts of snowfall during the winter. The following climate data for Mason County was collected in Ludington between 1981 and 2010. Ludington is located on Lake Michigan, and is subject to the influences of Lake Michigan. Inland areas of the county typically receive less snowfall and experience greater temperature extremes.

Ludington, Mason County, Michigan
Climate Normals and Extremes
1981-2010

Temperature	
Average Annual Daily Minimum Temperature:	37.7 degrees F
Average Annual Daily Maximum Temperature:	56.9 degrees F
Lowest Recorded Temperature:	-15 degrees (January 1982)
Highest Recorded Temperature:	99 degrees (August 1988)
Coldest Month:	January
Warmest Month:	July
Precipitation	
Average Annual Liquid Precipitation:	35.6 inches
Greatest 1-day Rainfall:	13+ inches (September 10, 1986)
Average Annual Snowfall:	91 inches
Greatest Annual Snowfall:	197.6 inches (1985)
Other	
Thunderstorms Day Per Year:	about 32 to 34
Prevailing Wind:	Southwest to south-southwest.

Mason County
Community Base Map



0 2.5 5 Miles

WMSRDC
WEST MICHIGAN SHORELINE REGIONAL DEVELOPMENT COMMISSION

Map created April 2016
Source: USGS National Map, MIGDL, ESRI

N

Interstate/Trunkline
County Primary Road
Critical Facility
Fire Station
Utility
Lake
River

III. WILDFIRE RISK ASSESSMENT

A. WILDFIRE DESCRIPTION

Most Michigan wildfires occur close to where people live and recreate, which puts people, property, and the environment at risk. Development within and around forested areas often increases the potential for loss of life and property from wildfires, since most fires are caused by human activities, such as outdoor burning.

Wildfires are a normal ecological phenomenon and serve long-term functions for vegetation and the natural environment. Wildfires can burn excessive brush, maintain large savannah-like openings, and restore wetlands by forcing out unwanted brush and vegetation. The natural function of fires within the environment can be considered a renewal or "cleansing process" as long as the fire is not too severe.

The negative impacts and immediate danger from wildfires are destruction of timber, property, wildlife, and injury or loss of life to persons who live in the affected area or who are using recreational facilities in the area. Other long-term and corollary effects of wildfire may include:

- Increased erosion and flooding, due to the disappearance of vegetation that would otherwise protect soils and slow surface runoff of water;
- Smoke (poor visibilities and air quality), closed roadways, and infrastructure impacts that may interfere with ordinary life, the economy, and planned tourism-based events; and
- Structural fires, particularly near outdoor recreation areas and wildland-urban interfaces.

The threat of wildfire may be elevated in times of drought, high heat, high wind, and/or low humidity. Unfortunately these conditions often coincide with attractive conditions for outdoor activity and recreation. This reinforces the fact that most wildfires are induced by human activity, rather than as a part of natural processes. Other factors that may increase the risk or severity of wildfire include: mild winters with abnormally low precipitation, allowing brush and other wildfire fuels to dry out; wind storms and frost/freeze damage, increasing the availability of dead fuels; and slow/late green-up in the spring. Conversely, a harsh winter with a heavy deep snowpack can mitigate wildfire risk in the spring. Such conditions compact dead fuels, reducing their surface-to-mass ratio and allowing them to retain moisture longer.

B. WILDFIRE HISTORY

Contrary to popular belief, lightning strikes are not the primary cause of wildfires in Michigan. Between 2001 and 2010, only about 7% of all wildfires in Michigan were caused by lightning strikes, while most other causes were attributed to human activity. Outdoor debris burning is the leading cause of wildfires in Michigan in recent years, comprising nearly one-third of the total. Most Michigan wildfires occur close to where people live and recreate, placing both people and property at risk.

Wildfires occur annually in Mason County, and have had significant effects on the area. Perhaps the first recorded catastrophic fire in Michigan occurred in October of 1871 after a prolonged drought over much of the Great Lakes region in the preceding summer months. Logging waste and debris, dried from the drought, greatly contributed to the spread of the fire. A similar series of wildfires burned in the spring and summer months of 1891. These fires played a role in dismantling Michigan's logging industry, and subsequently weakening the economy.

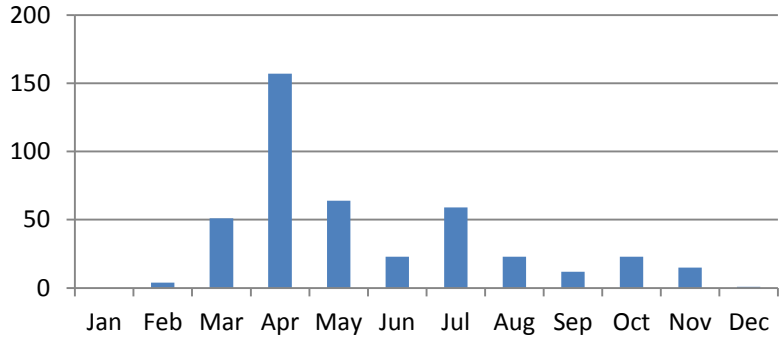
Wildfire incidents have continued to occur in Mason County and nearby areas of the state since the late 1800's despite advances in firefighting technology and methodology. These advances have reduced the number of acres burned per year and have helped prevent major wildfires such as those of 1871 and 1891.

Although Mason County has not experienced a catastrophic wildfire in recent memory, smaller wildfires happen numerous times each year. An example of a human-caused wildfire happened in Custer Township in March 2012. A bonfire left unattended caused a 40-acre wildfire in a swampy area bounded by Johnson, Stephens, Hansen, and Reek roads. Warm temperatures, dry vegetation, and high winds all helped the blaze. Firefighters responded from Custer, Branch, and Fountain, but more were needed due to the unique conditions in the area.

A significant task of this CWPP was to collect and compile wildfire records from each fire district and the MDNR. Each department provided wildfire records, some of which went back as far as 1999. These have been compiled and placed on a map which can be found in Appendix C. Unfortunately, departments in Mason County do not all record and maintain records of wildfire the same way. In addition, some departments had changed their methods for recording incidents over the previous 15 years. As a result, it was difficult to conduct a complete countywide analysis of wildfire histories based on the information available. However, the information gathered can help identify general observations, such as:

- Fire department calls for wildfire were most common where people live or vacation.
- The majority of documented wildfires with known causes were attributed to human activity. Conversely, only 10 out of 328 documented wildfires with known causes were attributed to an "act of nature" or a "natural source."
- By a wide margin, April is the most common month for wildfire in Mason County (see table below).

Documented Mason County Wildfires, by Month
1999-2014



Note - Going forward, one way to enhance wildfire tracking and analysis would be to establish a countywide standard for reporting and recording wildfires. This would enable a more useful analysis of county wildfire patterns, which could be used to inform the selection of appropriate wildfire mitigation measures.

C. WILDFIRE SETTING

Forests cover more than half of Mason County's land area. The forest cover is a boon for the economy and quality of life. However, it also makes many areas of the county potentially vulnerable to wildfires. Throughout the county, private developed lands, critical facilities, infrastructure, and recreation areas can be found adjacent to or scattered within forested lands. Additional factors that contribute to wildfire risk in Mason County include blight (associated with trash burning), pine stands and plantations, and oil / gas wells (specifically those with known detectable levels of hydrogen sulfide).

This section outlines the top countywide wildfire issues identified and agreed upon by the Wildfire Advisory Group. These issues include problems with access to residences, availability of wildfire fuels, and homeowner education for both permanent and seasonal residents.

Access

Most areas of Mason County have scenic natural settings that are desirable areas to live, such as the Lake Michigan shoreline, picturesque forests, and inland lakes and streams. Unfortunately, these areas are often located well off the beaten path and may be difficult for firefighters to access during an emergency. Specific issues related to access include: poorly maintained rural two-tracks; inadequate bridges; extreme topography; seasonal wetness in low-lying areas; narrow and often winding driveways with low clearance; and lack of room for staging and turning around firefighting equipment. In addition, inadequate house numbering and/or signage can further inhibit firefighters' ability to respond to an emergency. The potential for significant loss is compounded by the presence of large homes and higher property values in certain areas.

Federally-owned forestlands are another variable of the access issue in Mason County. Large areas of the Manistee National Forest are mainly found in the northwest, northeast, and southeast portions of the county. In many cases, private residences are scattered within privately owned pockets of the forest; while in other cases, private residences are located such that the only way to access them is to travel through the forest. Inadequate or non-existent motorized vehicle access to or through these areas is commonly cited as an issue of public safety. In addition, forest roads may be closed with little or no notice given to local fire departments.

Fuels

Bottom line: wildfires need fuel. To reduce the availability of fuel is to reduce the potential for catastrophic wildfire. In addition to the obvious availability of fuels due to the large areas of forests (including scattered pine stands) in Mason County, there are a number of other factors that contribute to the issue of fuels. In dune environments, primarily along the Lake Michigan shoreline, dune grass is a highly flammable and widely available fuel. The issue of access increases the threat to human developments in these areas, as firefighters often face significant impediments in dune environments. A second issue with fuels is the availability of dead vegetation left on the ground following in the fall and spring, and following high wind events. Too

often, residents use fire to clean their properties of this litter, creating potential wildfire hazards. Another contributing factor to the fuels issue is the potential for slashings, roots, and stumps to be left behind by clear cutting and logging operations. Such instances have occurred within the county in the past leaving behind hazardous fuels.

Information/Education

Fire safety education is important because most fires in the county are human-induced. In addition, Mason County is a popular destination for vacationers and seasonal residents who may be inclined to enjoy recreational fires. Education may be one way to reduce the number of wildfire starts.

Homeowner education is also a key to protecting existing and future structures, especially those that are located within or adjacent to wildland areas. Education would help encourage homeowners regarding the placement of new structures, use of fire-resistant landscaping and construction materials, and construction of driveways to accommodate emergency vehicles.

D. WILDLAND-URBAN INTERFACE (WUI)

A crucial step in local level wildfire management is the designation of the Wildland Urban Interface or "WUI." The WUI is defined by the National Wildfire Coordinating Group as:

"The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels."

In general, the WUI is an area that is subject to the natural conditions of the wildland. When conditions are right for fire in the wildland, there is a corresponding threat to structures, life, and property. The presence of human inhabitants also poses a special risk in these areas by way of non-natural ignition sources. In general, the threat of fire increases in the area designated as the WUI due to this human activity.

Designation of the WUI

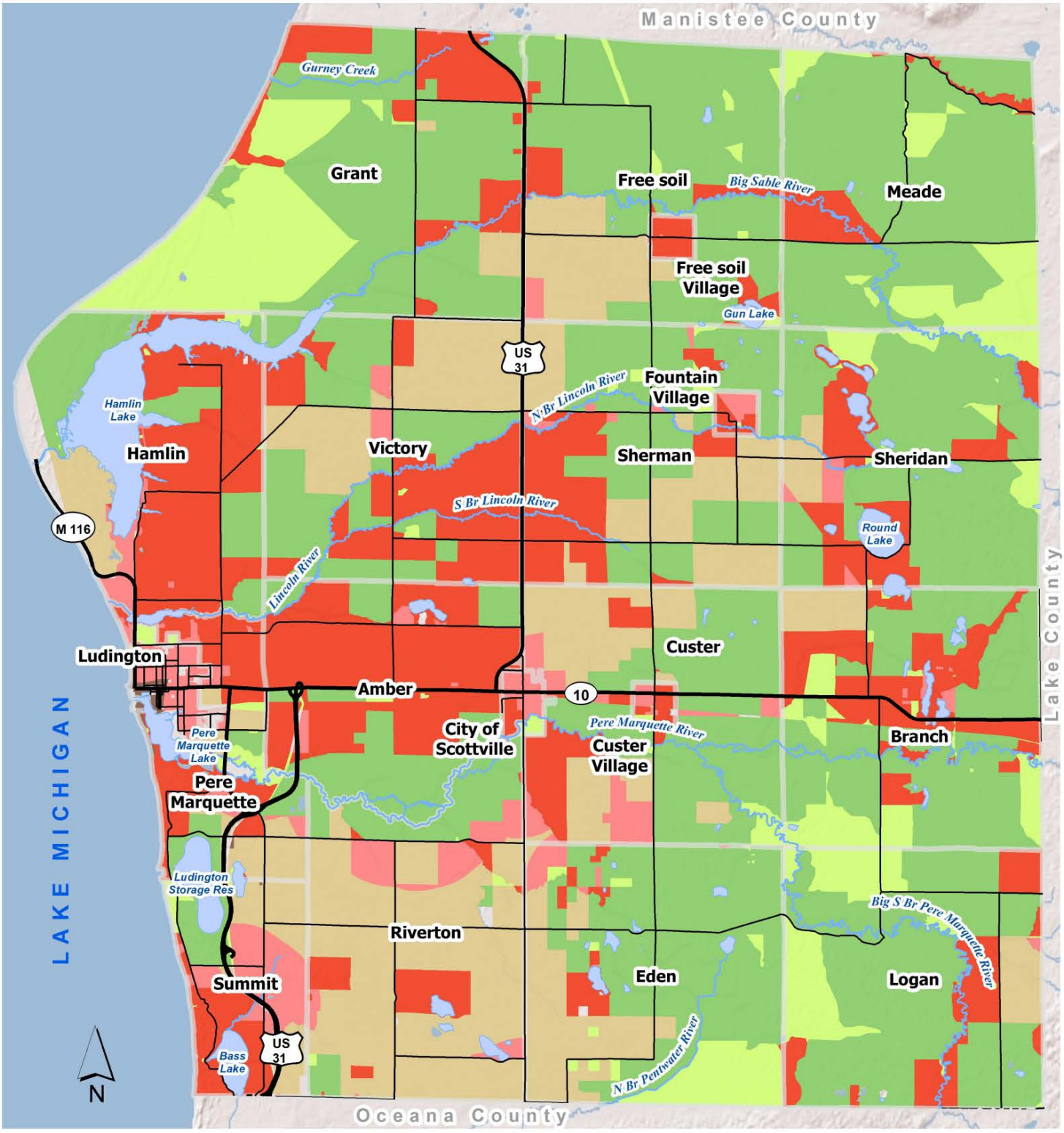
WUI is a fundamental issue in community wildfire protection plans. It is the local level where human development may be threatened by wildfire. This defined area must be reviewed, verified, and accepted by the local authority having jurisdiction and state fire management to meet the objectives of HFRA 2003.

Mason County contains a variety of landscapes and a variety of contexts in which development exists. Therefore it is difficult to concisely define the WUI. The WUI was discussed at several meetings of the Wildfire Advisory Group. It was ultimately decided that this plan should not adopt a strict WUI definition; as doing so may cause some WUI areas to be overlooked. The advisory group agreed on the following broad definition for WUI in Mason County:

"Any area where structures and other human developments meet hazardous vegetative fuels."

The generally defined Mason County WUI is shown on the Wildland-Urban Interface map on the following page. Data for this map was provided by the U.S. Forest Service, and identifies areas where structures are scattered throughout wildland areas (intermix areas), and areas where structures directly abut wildland fuels (interface areas).

Mason County
Wildland-Urban Interface Map



0 2 4 Miles

WUI
- Intermix
- Interface

Non-WUI Vegetated
- Low Density Vegetated
- Uninhabited Vegetated

Non-Vegetated Housing Density
- High and Medium Density
- Low Density

Intermix-area where structures are scattered throughout a wildland area with no clear line of demarcation.
Interface-area where structures abut wildland fuels with a clear line of demarcation between residential, business, public structures and wildland fuels.

WMSRDC
WEST MICHIGAN SHORELINE REGIONAL DEVELOPMENT COMMISSION

Map created April 2016
Source: USGS National Map, MIGDL, ESRI

E. RISK ASSESSMENT

In order to make informed planning decisions, the identified wildfire concerns and defined WUI must be paired with an analysis of conditions on the ground. It is known that areas of development located within or adjacent to wildland fuels have an inherently greater risk of damage from wildfire. Therefore, the Mason County WUI Wildfire Risk Analysis map at the end of this section shows an analysis of the aforementioned WUI and "Average Year Fire Hazard Risk" data obtained from the U.S. Forest Service (USFS). In order to determine WUI risk using these datasets, a weighted overlay analysis was performed using ESRI's ArcGIS computer mapping software. The weighted overlay tool allows for the comparison of variables by creating "common denominators" between different datasets. The tool also allows the ability to assign a measure of influence, or weight, to each dataset. This function is useful when trying to solve multi-criteria problems such as selecting the best site for development of a new facility, or in this case, assigning a scale of wildfire risk in WUI areas of Mason County.

For this assessment, the Average Year Fire Hazard Risk was considered a more influential factor and predictor of risk than the WUI dataset itself. The wildfire risk dataset estimates fire hazard according to anticipated fire behavior for a community in an average year, while the WUI dataset highlights areas where development abutted (interface) or was dispersed throughout (intermix) wildland areas. The WUI dataset therefore provides no direct assessment of wildfire potential, fire behavior or intensity, but does provides the geographic area and context for evaluation. Areas within the WUI boundaries that intermixed with wildland vegetation were considered to be at a higher risk in the context of this assessment than were areas that abutted or were not directly adjacent to wildland areas.

With those assumptions established, the following criteria were applied in order to conduct the analysis. The Average Year Fire Hazard Risk dataset was assigned a 65% level of influence and the WUI dataset was assigned 35% influence on the outcome of the analysis. To establish common denominators, risk factors within each dataset were assigned values on a scale of 1 to 9; 9 being the highest risk and 1 being the lowest. For example, crown fire was considered to be the most hazardous and intense type of wildfire within the Average Year Fire Hazard Risk dataset and was assigned a 9. Areas within the WUI dataset that were high density and intermixed with wildland vegetation were also assigned a risk factor ranking of 9.

The weighted overlay analysis produced a dataset of wildfire risk values within the Mason County WUI on a scale of 0 to 9, where larger values indicate higher risk. On the map, these values are geographically displayed at a 46-meter resolution. Values of 0 were omitted from the map, and the remaining values were grouped into three categories: "low risk," "moderate risk," and "high risk." This helped to paint a clearer, more organized picture of wildfire risk.

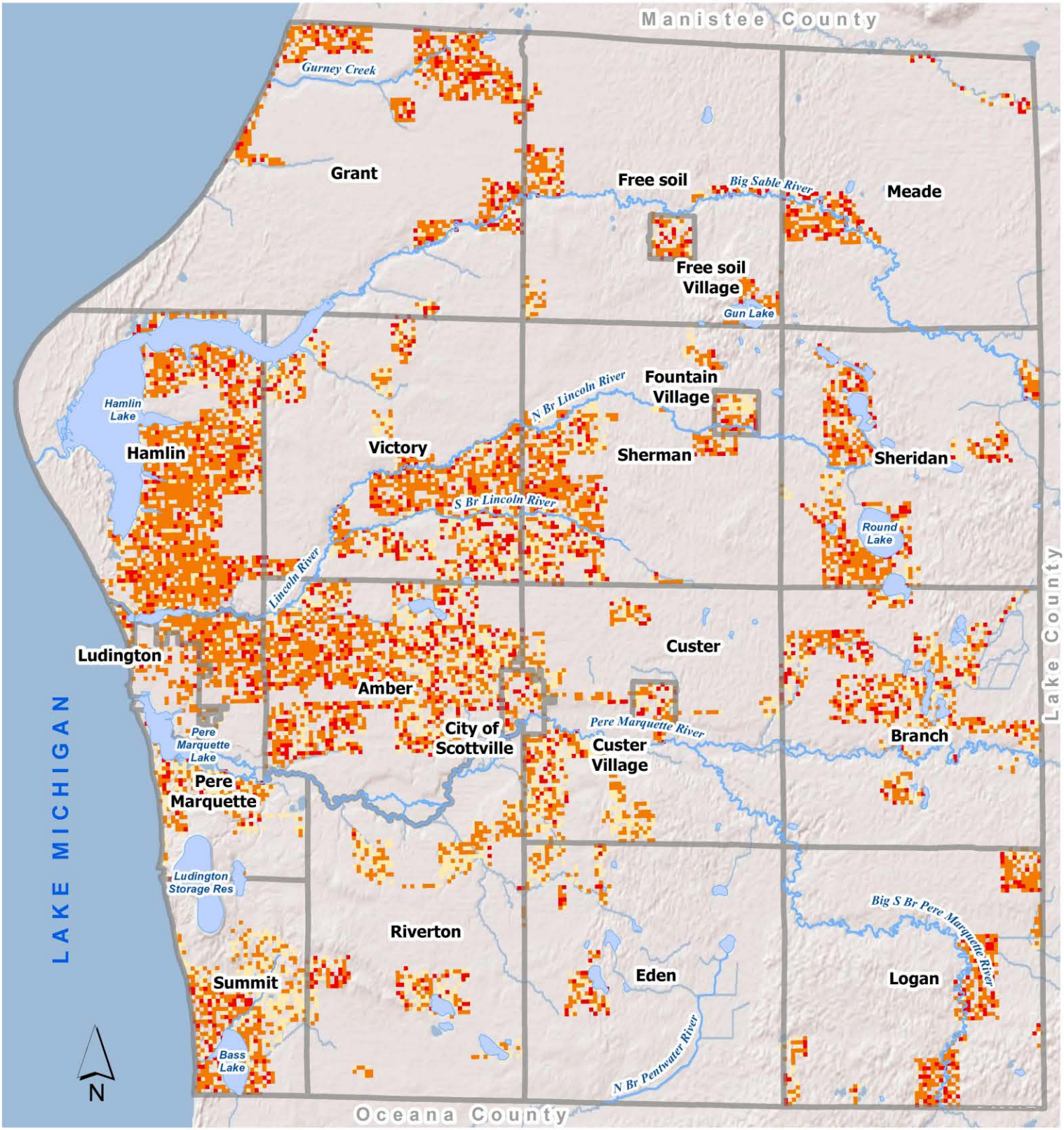
The purpose of the analysis is to highlight areas of development that may be subject to a greater risk of wildfire impacts. The levels of risk indicate where there may exist an **increased potential** for loss of life or property, should a wildfire occur. The analysis does not intend to indicate wildfire risk in terms of likelihood of occurrence. The map should be used as a tool to

help identify areas where mitigation measures will be the most effective in lessening the impacts of wildfire in Mason County.

The Wildfire Advisory Group reviewed the Mason County WUI Wildfire Risk Analysis map at its December 15, 2015 meeting. It was agreed that the map reasonably depicts areas of higher wildfire risk, and that it aligns with many wildfire concerns identified in group discussions. It was also agreed that the map should not be the only tool used to assess wildfire risk.

Lastly, it should be noted that this risk assessment is limited to WUI areas identified by USFS data. Maps showing countywide wildfire risk in terms of potential severity due to the type of vegetation are included in Appendix C. Other maps that were created to help analyze wildfire conditions in Mason County during the development of this plan are found there as well. Sources of digital geographic information utilized to create the maps in this plan include: U.S. Forest Service, U.S. Geological Survey, Multi-Resolution Land Characteristics Consortium, LANDFIRE, Michigan Geographic Data Library, and WMSRDC.

Mason County
WUI Wildfire Risk Map



0 2 4 Miles

Wildfire Risk

Low Risk
High Risk
Moderate Risk

WMSRDC
WEST MICHIGAN SHORELINE REGIONAL DEVELOPMENT COMMISSION

Map created April 2016
Source: USGS National Map, MIGDL, ESRI and Michigan DNR

IV. WILDFIRE MITIGATION

The information presented thus far is intended to aid the identification of mitigation projects, and to help ensure the efficient and effective implementation of those projects. The previous section discussed areas of the county where fires tend to occur, and areas where wildfire poses the greatest risk to life and property. The WUI Wildfire Risk map, combined with input from local fire departments regarding local wildfire concerns, provides the baseline for wildfire planning decisions to be made. Now that it is known where threats generally exist, the discussion shifts to identification of potential mitigation measures.

A. FUEL MANAGEMENT

Fuel management is the primary line of defense against the threat of an approaching wildfire. Proactive fuels management projects are an excellent way to protect property and prevent losses associated with wildfire. The National Wildfire Coordinating Group defines fuel management as the following:

(The) "Act or practice of controlling flammability and reducing resistance to control of wildland fuels through mechanical, chemical, biological, or manual means, or by fire, in support of land management objectives."

The first step is to outline fuel types and fuel arrangements that contribute to fire behavior in wildland areas.

Fuel Types

An understanding of the fuel types and fuels arrangement in the wildland is the first step to understanding how to manage fuels.

Fine Fuels- easy to ignite fuels with a diameter of less than one-quarter inch that are rapidly consumed and produce large flames. Examples include pine needles, dried grasses, dead leaves and twigs.

Coarse Fuels- thicker diameter fuels are slower to ignite, but when ignited burn for an extended time, producing small flames or smoldering. Examples of this fuel include tree trunks, limbs, and duff (the topmost layer of soil that is partially decayed).

Fuel Arrangements

The arrangement of fuel in the wildland affects how fire spreads in wildfire scenarios.

Fuel Loading- refers to the quantity of fuels in a given area that are available for combustion. Firefighters should be aware of both composition and moisture content.

Horizontal Continuity- a description of the arrangement of fuels horizontally across the landscape. The arrangement may be continuous or patchy. Patchy areas include places that have little or no vegetation including bare ground and other non-fuel areas. Continuous areas are places with uninterrupted vegetative fuels.

Vertical Arrangement- a description of the vertical arrangement of fuels, including: ground fuels (found beneath the surface); surface fuels (resting on the ground's surface or immediately above the surface); and aerial fuels (all vegetation in a forest's understory and canopy).

The Fuel Ladder- describes how fuels allow surface fires to move into the forest canopy. It is composed of three areas; the ground level, the understory, and forest canopy.

The following strategies may be utilized to manage fuels.

Vegetative Treatments

In order to stop or slow the progression of a wildfire, an interruption of the *horizontal continuity* and/or a break in the *fuel ladder* may be enough to prevent or inhibit catastrophic fire. Breaking the continuity of fuels in the wildland is referred to as 'vegetative treatment.' This can be achieved through the application of any number of different fuels treatments, or by prescribing a combination of treatments.

Fuel Ladder- treatment of the fuel ladder can be an excellent means of preventing catastrophic fire. By removing the aerial fuels in the understory of the forest from the ground to approximately 6 feet above the ground, it is possible to prevent fire from moving from the ground into the understory and the canopy. Treating the fuel ladder around structures and areas prone to crown fires may mitigate the potential for catastrophic fire.

Vegetative Thinning- treatment of the horizontal continuity of fuels can slow the spread and intensity of fires in the wildland. In general, the spacing of trees or tree groups 10 – 15 feet apart can prevent torching. Thinning of shrubs and separation of shrubs by at least 15 feet can also lessen the intensity of fires.

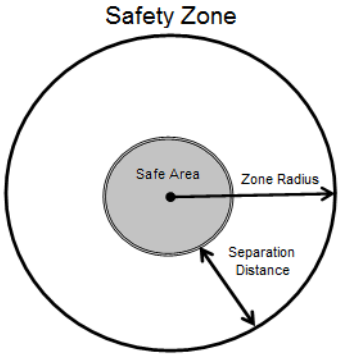
Crown Thinning- a form of vegetative thinning that applies to the forest canopy. This method slows the movement and intensity of fire through the canopy. By spacing tree crowns or groups of tree crowns 10 feet or more apart, torching can be stopped under most conditions.

Fuel Breaks- literally a break in the fuels complex of the forest. Fuel breaks can be effective in mitigating surface fires, understory fires, and if wide enough can stop the spread of a canopy fire. If the intention of the fuel break is to stop the spread of a canopy fire, its width should be at least 1½ the length of the flames of a high intensity fire.

Fuel Break System- a series of modified strips, fire resistance areas, or blocks of cleared land tied together to form a continuous strategically located fuel break.

Safety Zones

A safety zone is similar to a fuel break but intended to protect fire-fighters and vehicles from a wildfire. It should be easily accessible and large enough to keep fire fighters at least four times the distance of the height of the tallest flames of the adjacent burning fuels. For example, a safety zone with fuels that burn at 20 feet should have an 80 foot buffer zone between the fire and personnel and be at the least ½ an acre in size.



Flame Height	Separation Distance	Area in Acres
10 feet	40 feet	1/10 acre
20 feet	80 feet	½ acre
50 feet	200 feet	3 acres
75 feet	300 feet	7 acres
100 feet	400 feet	12 acres
(1 acre = 208 feet x 208 feet, or the approximate size of a football field)		

Shelter-in-Place

Similar to the 'safety zone' concept, a shelter in place is an area that can be protected from a wildfire. It is a way to protect the public from an advancing wildfire by instructing people to remain inside a safe structure until the danger passes. This method of incident response can be implemented where time, hazards, and logistics make an evacuation impossible. The success of this tactic depends on detailed preplanning that takes into account the construction type, building materials, topography, and the surrounding fuel loading.

Defensible Space

The area around every home and structure should be examined and considered to become "defensible space." With implementation of proper fuels management, this area can be defendable by a fire department in fire scenarios. Fire departments should keep track of homes that have implemented defensible space. In the event of a wildfire, a fire department may not be able to protect structures or homes without defensible space and may divert resources to areas that may be more easily protected. As one of the most effective means of mitigating community wildfire risk, landowners should be urged to adopt the practice.

Stewardship Contracting

A by-product of hazardous fuel reductions can be a large quantity of woody biomass. This by-product can be utilized by local "sustainable" industries. Becoming familiar with industries interested in utilization of biomass and inviting them to participate in the mitigation process could be mutually beneficial to local governments and local business. These beneficial relationships can develop into partnerships and can increase the effectiveness of fuels reductions by offsetting costs.

The US Forest Service provides an excellent resource that explains how it has used Stewardship Contracting in their land management activities. Mason County and/or individual fire departments may be interested in developing a contracting program for fuels reduction. Additional information about the USFS Stewardship Contracting program is available at http://www.fs.fed.us/restoration/Stewardship_Contracting/index.shtml.

B. REDUCING STRUCTURAL IGNITABILITY

One of the requirements for community wildfire protection plans by the Healthy Forest Restoration Act is to address structural ignitability and provide strategies to reduce structural ignitability. When homeowners take the initiative to establish and identify their home ignition zone and take steps to modify the conditions in this area, their home will have a much higher likelihood of surviving a wildfire.

Ignition Types

Homes and structures can ignite from direct flame contact, convection, radiation from nearby burning materials, and from flying embers (firebrands). Firebrand ignition happens when a burning ember lands on the home or on fuels adjacent to the home. Flame ignitions typically require direct contact with the structure. Most structures will not succumb to ignition by radiation, especially if flames are 30 or more feet from the house.

Protecting Structures from Ignitions

There are a number of steps homeowners can take to protect their investments. Here is a brief list of ignition prevention strategies that can increase home safety.

Firewise Landscaping- a method of reducing structural ignitability. This involves removing all

flammable vegetation within 5 feet of a structure, removing trees and tree limbs within 10 feet, and keeping a tidy green lawn. The "home ignition zone" is the space 30 feet around a structure. Trees and vegetation in this area should be sparse and spaced at least 15 feet apart. All ladder fuels should be removed within 100 feet of the structure, with thinning of trees and vegetation in this area also recommended. Other considerations include non-flammable walkways and decks, removal of woodchips around structure, and the use of rocks in landscaping.

Seasonal Maintenance- clear eaves, gutters, and roof of debris early every spring and fall. Sweep decks and wooden walkways of flammable debris and remove combustible materials from under these structures. Rake around structures to remove combustible debris. These actions prevent ignition from firebrands and prevent torching by convection if a surface fire advances on the structure.

NFPA Recommendations

The following actions are recommended by the National Fire Protection Association to reduce structural ignitions.

Roofing- use of class A roofing materials. Any covering that is non-combustible and does not self-sustain or spread fire is considered to be an appropriate roofing choice.

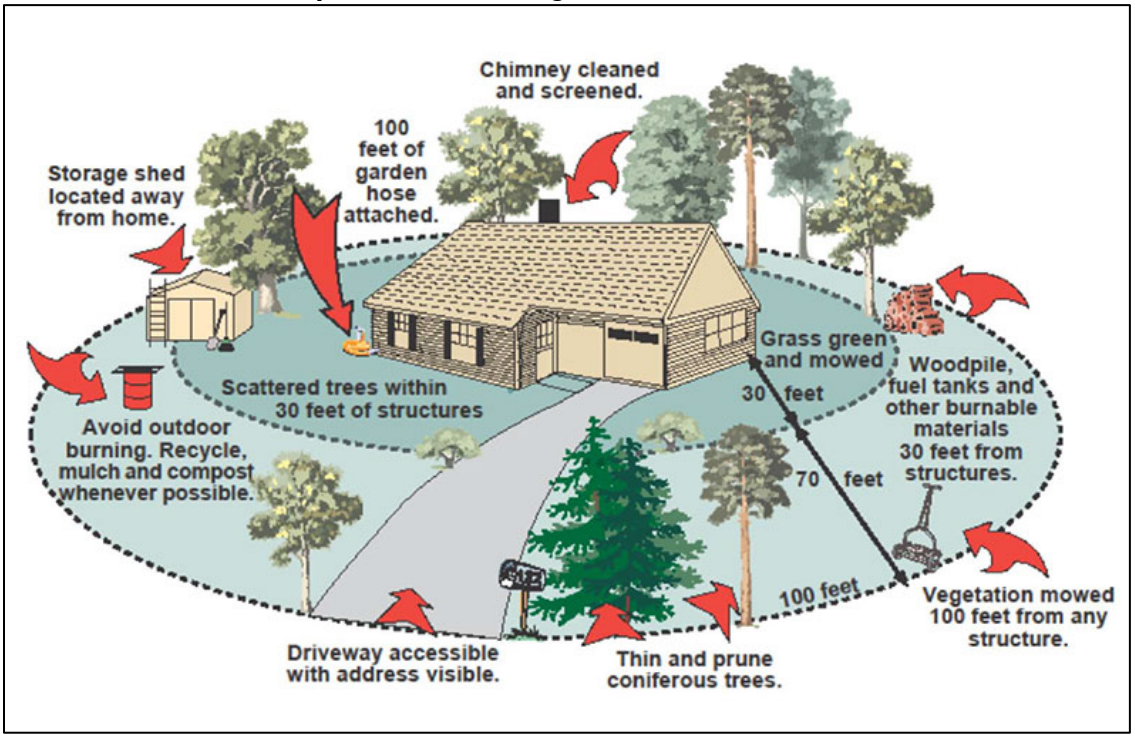
Screening- use of at least a 1/4 inch screen over all openings of structure, especially ground and attic vent openings.

Siding- use non-combustible siding materials.

Windows- installation of double paned windows. Close windows tightly prior to emergency fire evacuation.

Chimney and flue- spark arrestors made of at least 12 gauge steel with openings no greater than ½ inch. Vegetation shall be no closer than 10 feet from chimney outlet.

Defensible Space and Home Ignition Zone Recommendations



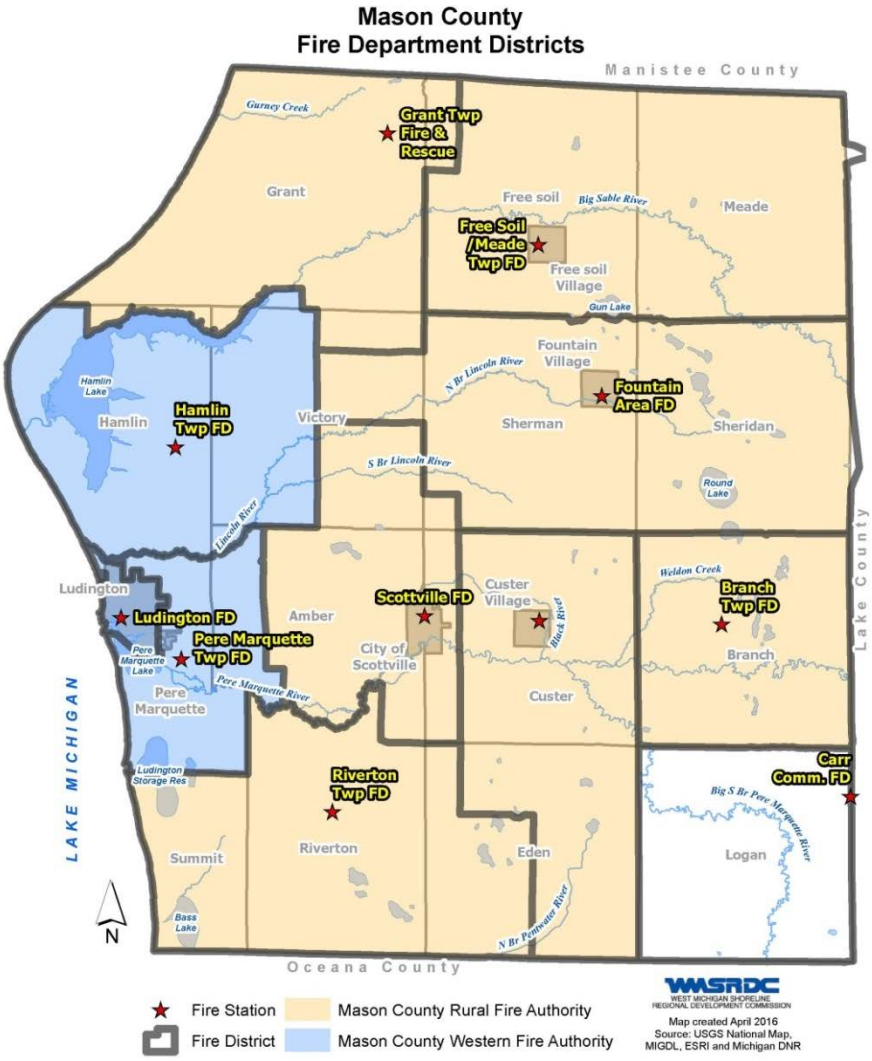
Source: Lincoln County FireSafe Council, http://www.lcfiresafe.org/homeowner-info.html

V. FIRE MANAGEMENT

This section explores fire management within the context of wildfire response and prevention in Mason County. It contains a description of the county's fire departments, federal and state land management, and issues pertaining to fire response in Mason County.

A. LOCAL FIREFIGHTING SETTING

Fire protection in Mason County is provided by eleven fire districts, the Michigan Department of Natural Resources (MDNR), and the U.S. Forest Service (USFS). In 1996, Mason County chose to stop contributing to fire departments. As a result, two fire authorities were formed. The Western Fire Authority includes Ludington and the townships of Hamlin and Pere Marquette. The Mason County Rural Fire Authority includes the fire departments of Scottville, Custer Township, Branch Township, Riverton Township, Fountain Area, Free Soil/Meade and Grant Township). Carr Fire Department in Logan Township is the only department in Mason County that does not belong to an authority.



One strategy of this CWPP was to rely on each fire district to provide information needed to identify local wildfire histories, risks, special vulnerabilities, and response capabilities. A questionnaire was distributed to the designated representatives of each fire department. Information received through this process has been compiled into fire department profiles which can be found in Appendix A of this plan. Each profile also includes a 2013 aerial image, a map showing notable assets of the area, and a WUI Wildfire Risk map.

B. REGIONAL FIREFIGHTING SETTING

U.S. Forest Service

Mason County contains a portion of the Huron-Manistee National Forests, which cover almost a million acres of public land in Michigan across a transitional zone between forested lands to the north and agricultural lands to the south. Mason County lies within two USDA Forest Service Ranger Districts: the Baldwin-White Cloud and Cadillac-Manistee.

Formed by glaciers thousands of years ago, these lands are characterized by relatively low relief, abundant sand, clear water and diverse forests. In the late 1800s logging was at its peak and these forests were clear-cut, burned and poorly farmed. In 1909, the Huron National Forest was established and the Manistee National Forests was formed in 1938. In 1945, these two National Forests were administratively combined. The diverse, maturing forest ecosystems that exist today are the result of nearly a century of forest management.

The Huron-Manistee National Forests Land and Resource Management Plan guides all natural resource management activities for the Huron-Manistee National Forests. It describes desired resource conditions, resource management practices, levels of resource production and management, and the availability of suitable land and resource management. The purpose of the plan is to provide management direction to ensure that ecosystems are capable of providing a sustainable flow of beneficial goods and services to the public. The plan may be freely accessed at http://www.fs.usda.gov/main/hmnf/landmanagement/planning.

Michigan Department of Natural Resources

The MDNR's Cadillac Unit manages over 235 thousand acres of state forest lands in Missaukee, Osceola, Lake, and Wexford counties, and provides wildfire protection for over a million acres of state and private land in those counties, as well as portions of Mason and Mecosta counties. The Cadillac Unit Headquarters is at the Cadillac Operations Service Center and is open to the public. Mason County is primarily serviced by the Baldwin Field Office, which also services Lake County. The Evart Field Office services Mecosta and Osceola counties, and the Manton Field Office services Wexford and Missaukee counties. Additional detail regarding the Cadillac Unit's resources and capabilities is available in Appendix B of this plan. The Oceana Field Office, formerly situated within the Cadillac Unit, is now part of the MDNR Plainwell Unit. It services Oceana and Newaygo counties, and may be called to respond to a fire in Mason County.

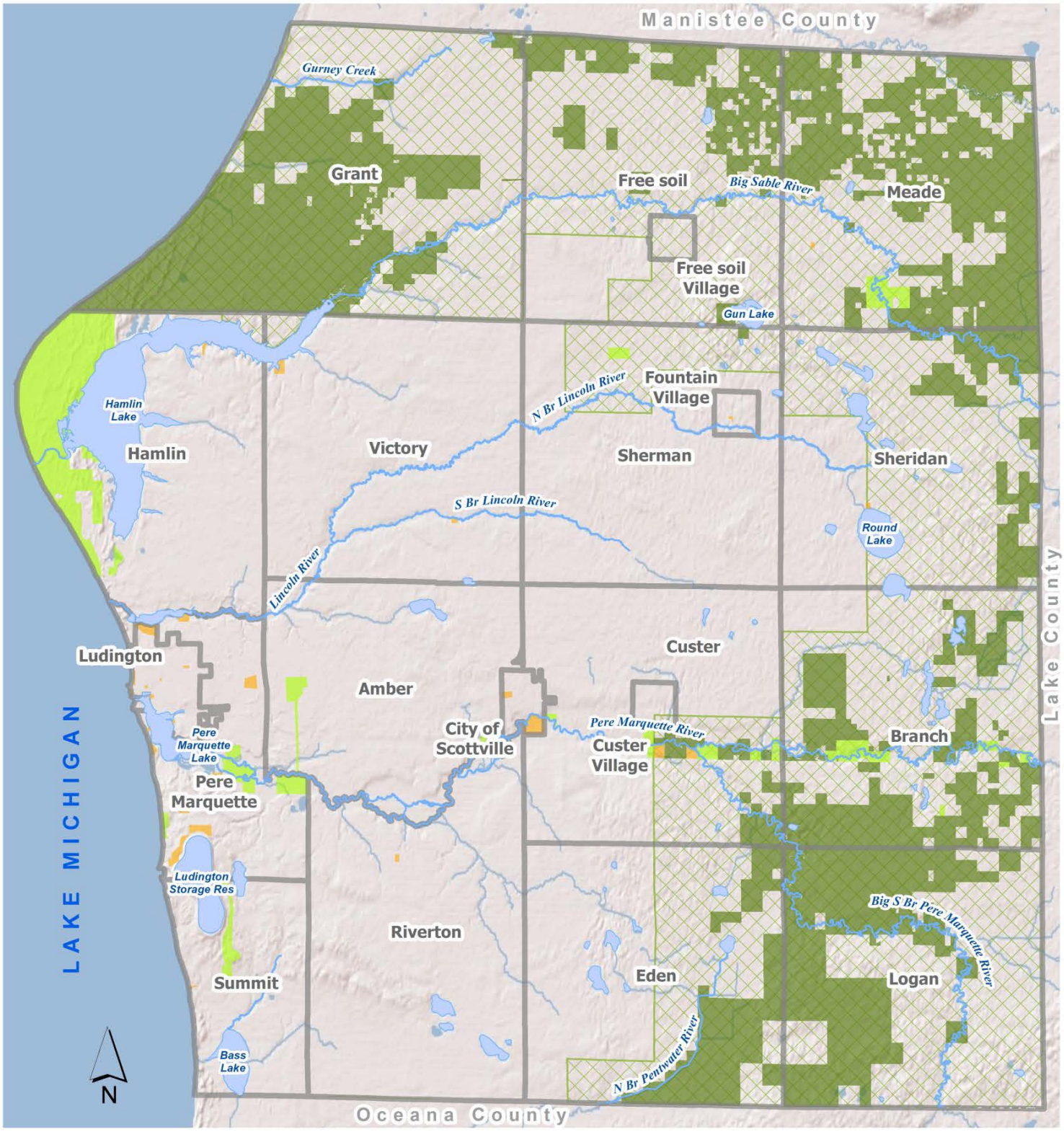
Beyond the provision of resources and expertise in wildland fire suppression, the MDNR also carries the legal responsibility, according to state law, over wildland fires. During a major fire emergency the MDNR has the ability to mobilize resources across the state to support a large fire operation. It also has Incident Management Teams that can be deployed to orchestrate large fire operations. In the event that a situation exceeds the capacity of those resources, the MDNR has mutual aid agreements in place with the USFS and through the Great Lakes Forest Fire Compact (WI, MN, MI, Manitoba & Ontario). These other entities can offer helpful resources such as trucks, dozer, manpower, and supervision; as well as specialized equipment such as tanker planes and helicopters.

The MDNR also operates Ludington State Park; manages the Pere Marquette State Game Area in Pere Marquette Charter Township; and has numerous other parcels scattered about the county, such as those along the Pere Marquette River. Ludington State Park encompasses about 5,300 acres in Hamlin Township. The Pere Marquette State Game Area occupies approximately 400 acres in Pere Marquette Charter Township and has been dedicated for wildlife conservation and management by the DNR Wildlife Division.

Mutual Aid Agreements

Mutual aid is an agreement between fire departments allowing for emergency assistance across jurisdictional boundaries. Mutual aid agreements operate under a cooperative basis during incidents that exceed local resources. All local fire departments within the county share a mutual aid agreement. Additional agreements held by fire departments with federal or state agencies or fire departments outside of Mason County are noted in in Appendix A.

Mason County
Land Ownership Map



0 2 4 Miles

Federal Land
State Land
Municipal Land
Manistee National Forest

WMSRDC
WEST MICHIGAN SHORELINE REGIONAL DEVELOPMENT COMMISSION

Map created April 2016
Source: USGS National Map, MIGDL, ESRI and Michigan DNR

C. TRANSPORTATION NETWORK AND EMERGENCY ACCESS

Mason County contains a wide variety of roads which may be used for responding to wildfire. Unfortunately, some of the most pressing wildfire concerns occur in areas that have roads, bridges, and driveways that are unsuitable or unsafe for firefighting apparatus. A detailed analysis of the transportation network and access for fire suppression would aid in operations preplanning, identify areas where improvements are needed, and may also help determine the need for response strategies and new apparatus. However, a countywide study of that magnitude is currently beyond the scope of this CWPP. The following considerations may be components of transportation network and access study in the future. Some have been identified for implementation within Chapter 6 – Action Plan.

Road Classification- surface type, road width, apparatus accessibility, bridge load limits, and other factors that affect emergency vehicle accessibility. Not all apparatus can respond to fire incidents in every area of the county. Knowing what equipment can respond to certain areas will aid in suppressions response and mobilization of resources.

Promote Street Signage and Addressing- nonflammable reflective street signage should be placed at every intersection on a non-flammable post. Not every responder in a catastrophic fire event will be familiar with local roads. Especially within the WUI, fires can be very chaotic and even the most experienced responder may become disoriented by the smoke, fire, and other incident stresses.

Inventory Turnarounds- every dead end road should have a turnaround that meets the NFPA fire code guidelines for apparatus turning radius. This can be accomplished by working with the road commission, subdivisions, property associations, and larger organizations such as camps to plan for needed turnarounds within the right of way.

Escape Routes- places with one ingress/egress route may become easily blocked and impassable due to fire, smoke, or broken down vehicles. These routes may be inventoried and prescribed with emergency pull-off sites and fuels reduction treatments.

D. WATER SUPPLY

Access to a reliable water supply is a tactical necessity for wildfire suppression. The source, delivery, and use of water in wildland fire suppressions may vary depending on location within Mason County. More detail regarding types and locations of water sources for fire suppression can be found within the individual fire department profiles in Appendix A. State and federal funding may be available to improve access to water where it is needed.

E. WILDFIRE EDUCATION

Education is an ongoing activity in the world of fire-fighting and wildfire awareness. There are a number of educational resources that fire departments can exploit, free of charge, to increase public knowledge associated with wildfire and enrich each department's base of knowledge.

The National Fire Protection Association provides educational materials free of charge on their website at www.nfpa.org under "catalog." Once in the NFPA Catalog, type "Wildland Urban Interface" into the search box and review materials. Also search "Firewise" for educational materials related to the Firewise communities program.

The Ready, Set, Go! (RSG) Program, managed by the International Association of Fire Chiefs (IAFC), seeks to develop and improve the dialogue between fire departments and the residents they serve. Launched nationally in March 2011 at the Wildland-Urban Interface Conference, the program helps fire departments to teach individuals who live in high risk wildfire areas – and the wildland-urban interface – how to best prepare themselves and their properties against fire threats. RSG tenets help residents be *Ready* with preparedness understanding, be *Set* with situational awareness when fire threatens, and to *Go*, acting early when a fire starts. Go to http://www.wildlandfirersg.org/ for more information.

VI. ACTION PLAN

The following table reveals a summary of action items selected to address wildfire in Mason County. These were discussed during the March 16, 2016 Wildfire Advisory Group meeting. All identified action items are considered priorities within the CWPP. In order to help structure implementation of the CWPP, a general priority level of high, medium or low was assigned to each measure. Some items may have been given a lower priority due to circumstances beyond the control of the CWPP, such as stakeholder buy-in. The list should be reviewed and revised annually, and progress should be discussed, tracked, and documented.

	High	Medium	Low
Goal 1: Mitigate Accidental Ignitions			
1a. Conduct fire safety programs		x	
1b. Wildfire prevention activities for the public furnished by MDNR, USFS, and local fire departments	x		
1c. Promote "Firewise on the Farm"	x		
1d. Public opportunities for trash disposal			x
Goal 2: Reduce Catastrophic Fire Potential			
2a. Acquire and distribute Firewise program materials to permanent and seasonal residents	x		
2b. Identify key roads / evacuation routes			x
2c. Identify locations for strategic firebreaks			x
2d. Identify locations for vegetative treatments			x
2e. Sponsor neighborhood cleanup days			x
2f. Organize chipping / disposal opportunities			x
2g. Home risk assessments		x	
2h. Identify demonstration houses and public facilities			x
Goal 3: Fortify Existing Structures and Infrastructure			
3a. Encourage homeowner / facility operator participation in the Firewise program		x	
3b. Identify potential "ignition resistant" standards that go beyond minimum requirements of current building codes			x
Goal 4: Support Fire Suppression and Emergency Response Capabilities			
4a. Ensure adequate access to water sources, especially within WUI areas			x
4b. Improve access to isolated properties	x		
4c. Coordinate with zoning bodies and land owners to set recommendations for emergency vehicle access	x		
4d. Maintain equipment, and acquire additional equipment as necessary			x
4e. Firewise training	x		
4f. Annual wildfire suppression training for local fire departments provided by MDNR and USFS	x		
4g. Information sharing through Mason County	x		

GOAL 1: Mitigate Accidental Ignitions *Measures to reduce the number of human-induced wildfire starts.*		
Action Items	**Possible Responsible Parties**	**Timeframe**
1a. Conduct fire safety programs. *Priority Level:* MEDIUM *Description:* Encourage the continuation and/or expansion of fire department efforts to engage in fire safety education.	Local Fire Departments	Annually
1b. Wildfire prevention activities for the public furnished by MDNR, USFS, and local fire departments. *Priority Level:* HIGH *Description:* The public will be informed about ways to prevent human-induced wildfire starts, such as: installation of spark arresters, proper installation of fire rings, observation of burn bans, etc.	Local Fire Departments USFS MDNR	Annually
1c. Promote "Firewise on the Farm." *Priority Level:* HIGH *Description:* A campaign to educate farmers and farm workers on the importance of following safe fire practices associated with brush burning, farm equipment operation, and other activities. This should be embraced by agencies that frequently interact with agricultural producers.	Local Fire Departments MSU Extension Conservation District	Annually; Begin implementing Winter 2017/2018
1d. Public opportunities for trash disposal. *Priority Level:* LOW *Description:* Provide residents with a viable alternative to trash / vegetative waste burning. This may include "community trash days" or establishment of low / no-cost waste receiving stations or transfer sites. Implementation should be assessed by each individual community and would require local government support.	Local Fire Departments Local Governments	Ongoing
GOAL 2: Reduce Catastrophic Fire Potential *Fuels reduction activities and other measures intended to mitigate the damage potential of wildfires.*		
Action Items	**Possible Responsible Parties**	**Timeframe**
2a. Acquire and distribute Firewise program materials to permanent and seasonal residents. *Priority Level:* HIGH *Description:* Firewise principles are a critical component of fuels reduction on private property. Local fire departments and Mason County Emergency Management will refer to firewise.org and work with MDNR to obtain materials for distribution. Look for opportunities to distribute materials along with tax, property assessment, and other local government mailings.	Local Fire Departments Mason Co Em. Management	Following adoption of this plan; continue on an ongoing basis
2b. Identify key roads / evacuation routes. *Priority Level:* LOW *Description:* Once identified, key roads and evacuation routes will be targeted for vegetative fuels reductions and increased accessibility for emergency responders. Incorporate information collected into the Mason County GIS, such as seasonal roads and low-tonnage bridges.	Local Fire Departments Mason Co. Road Commission	As time and funding permit

2c. Identify locations for strategic firebreaks. *Priority Level:* LOW *Description:* Utilize available aerial imagery and GIS technology in concert with existing maps and ground information to identify and map potential locations for firebreaks. Work with state and federal forestry agencies to implement an effective firebreak program.	MDNR USFS	As time and funding permit
2d. Identify locations for vegetative treatments. *Priority Level:* LOW *Description:* Locations for vegetative treatments will include access roads / evacuation routes, areas within the WUI, and other high risk areas identified within this plan. Subsequent actions may include enlisting landowner participation, acquisition of equipment, and performing vegetative treatments on the ground.	Local Fire Departments MDNR USFS	As time and funding permit
2e. Sponsor neighborhood cleanup days. *Priority Level:* LOW *Description:* Reduce the amount of trash and vegetative fuels that might otherwise be intentionally burned.	Local Fire Departments Local Governments Law Enforcement	Annually
2f. Organize chipping / disposal opportunities. *Priority Level:* LOW *Description:* Aspects may include: acquisition of a wood-chipping device for use in county neighborhoods to reduce fuels loads; and temporary storage locations for downed vegetation to help reduce neighborhood fuel loads. This may be most applicable during post-disaster activities.	Mason Co. Road Commission Mason Co. Em. Management	Annually, and/or during storm recovery
2g. Home risk assessments. *Priority Level:* MEDIUM *Description:* Following implementation of action item 4d, Firewise Training, local departments will offer to conduct home ignition-zone hazard assessments.	Local Fire Departments	Following completion of Action Item 4d; As time and funding permit
2h. Identify demonstration houses and public facilities. *Priority Level:* LOW *Description:* Demonstrate and publicize Firewise recommendations at private properties and public facilities.	Local Fire Departments	Following completion of Action Item 4d; Annually

Goal 3: Fortify Existing Structures and Infrastructure

Measures intended to increase the community's resistance to wildfire by reducing structural ignitability.

Action Items	Possible Responsible Parties	Timeframe
3a. Encourage homeowner / facility operator participation in the Firewise program. *Priority Level:* MEDIUM *Description:* The Firewise program offers a number of proven methods for reducing structural ignitability. Participation in the program will be encouraged through distribution of Firewise materials and through presentations at public meetings and to local government boards and planning commissions by local fire departments and Mason County Emergency Management. This action item may be most effective following implementation of action item 4d, Firewise Training.	All local, state, and federal agencies	Ongoing
3b. Identify potential "ignition resistant" standards that go beyond minimum requirements of current building codes. *Priority Level:* LOW *Description:* Identify and promote special standards to help new structures be more resistant to wildfires. These standards would be most beneficial in WUI / high wildfire risk areas.	Building Officials	Ongoing

Goal 4: Support Fire Suppression and Emergency Response Capabilities *Enhance the safety of emergency responders and enhance response capabilities during an emergency.*		
Action Items	**Possible Responsible Parties**	**Timeframe**
4a. Ensure adequate access to water sources, especially within WUI areas. *Priority Level:* LOW *Description:* Assess the availability of water sources. Note areas with insufficient access to water sources for fire suppression.	Local Fire Departments	As needed
4b. Improve access to isolated private properties *Priority Level:* HIGH *Description:* Serious access issues for emergency response exist with many private properties in the county, especially along the Lake Michigan coastline and within or around publicly-owned lands. Property owners will be made aware of the problem; be educated on ways to address the problem; and be encouraged to take action. Private landowner participation is critical.	Local Fire Departments Local governments Zoning Officials Mason Co. Road Commission	As funding and participants are available
4c. Coordinate with zoning bodies and land owners to set recommendations for emergency vehicle access. *Priority Level:* HIGH *Description:* Develop appropriate standards for access, including driveway width/height, turn around space, address signage, and bridge loads.	Local Fire Departments Local governments	By 2018
4d. Maintain equipment, and acquire additional equipment as necessary *Priority Level:* LOW *Description:* Equipment evaluation and maintenance will continue with added considerations for wildland fire suppression. Departments will also regularly maintain the inventory of equipment found in Appendix A of this document to inform agencies of each other's equipment and capabilities, and facilitate assessment of equipment needs on the county level.	Local Fire Departments	As funding is available
4e. Firewise training. *Priority Level:* HIGH *Description:* Work with state and federal foresters to identify and implement Firewise training for fire fighters, building officials, elected officials, and law enforcement.	Local Fire Departments Local Governments	Following adoption of this plan; As training is available
4f. Annual wildfire suppression training for local fire departments provided by MDNR and USFS. *Priority Level:* HIGH *Description:* Local fire departments will continue to receive wildfire suppression and training from MDNR and USFS personnel.	Local Fire Departments USFS MDNR	Annually
4g. Information sharing through Mason County. *Priority Level:* HIGH *Description:* Identify a Mason County point of contact to disseminate information to fire departments from MDNR and USFS. Of particular concern are forest route closings and prescribed burns.	Mason Co. Em. Management USFS MDNR	Following adoption of this plan

VII. PLAN MAINTENANCE

Over time, Mason County will have the opportunity to consider how this plan has helped reduce wildfire risk, while also meeting state and national goals for wildfire risk reduction. This chapter is intended to encourage and present strategies for long-term maintenance of this plan.

A. MONITORING & EVALUATION

The risks from fires are continual. Therefore the CWPP process should not end when the plan is adopted. Monitoring wildfire threats and mitigation progress are part of a process that revolves around the community's needs and desired amount of protection. A thorough process should involve a continuous cycle of collaborative planning, implementation, monitoring, and adapting strategies based on lessons learned.

CWPP Monitoring and Evaluation Guidelines:

- Only monitor what matters. Since resources are scarce, do not attempt to engage in complex monitoring process. Identify key goals and objectives, and make decisions to monitor what is most important to long-term sustainability of the CWPP.
- Track accomplishments and identify the extent to which CWPP goals have been met.
- Monitor how collaborative efforts have contributed to CWPP implementation, and when possible identify new partners or better arrangements.
- Identify actions and priority fuels reduction projects that have not been implemented, and why.

CWPP Evaluation Guide

Perhaps the most critical aspect of a monitoring and evaluation process is to identify the impact the CWPP has had on the community. A 2008 publication from the University of Oregon, CWPP Evaluation Guide, provides a step-by-step process to evaluate how well a community has addressed the goals and objectives of its CWPP, and modify actions for the future accordingly. This evaluation may be a helpful tool to celebrate successes, identify gaps, and update this CWPP.

Framework for Monitoring and Evaluating a CWPP

The table on the following page may also be used to help monitor and evaluate this CWPP. The table lists six broad CWPP goals and a series of questions to help monitor and evaluate accomplishments, challenges, and how well goals have been met.

Framework for Monitoring and Evaluating a CWPP

1. Partnerships and Collaboration	- Who has been involved with CWPP development and implementation? How have relationships grown or changed through implementation? What resources did they bring to the table?
	- How did the fire planning process influence CWPP implementation?
	- How has the collaborative process assisted in implementing the CWPP and building capacity for the community to reduce wildfire risk?
	- Have social service agencies (or groups that might assist low-income and vulnerable populations) partnered on CWPP efforts? If so, how?
	- Have CWPP partners remained engaged in implementation? Have new partners become involved? How have the relationships established through the CWPP enhanced opportunities to address plan goals?
	- Has collaboration made a difference or a positive impact on local organizations, neighborhoods and/or actions?
2. Risk Assessment	- How has population growth/change and development in your community affected wildfire risk?
	- If this is a multi-jurisdictional plan, what is the number and percent of communities at risk with a CWPP in the area? Are all communities at risk identified in the CWPP, and are there priority fuels projects identified in the area?
	- Are there new or updated data sources that may change the risk assessment and influence fuels priorities?
	- How is the risk assessment being used to make decisions about fuels priorities or the designation of the WUI boundary?
	- Has the community enacted a wildfire-related ordinance? If so, county, state, or local?
	- What percent of communities at risk are also low income or have special needs? Have these communities been engaged in reducing wildfire risk?
3. Reducing Hazardous Fuels	- How many acres have been treated for hazardous fuels reduction on public and private land that were identified as high-priority projects in the CWPP? What percentage of total acres treated does this constitute?
	- How many fuels reduction projects have spanned ownership boundaries to include public and private land?
	- What is the number and percent of residents that have participated in projects and completed defensible space on their land?
	- Economic development resulting from fuels reduction?
	- How many local jobs have resulted because of fuels reduction or restoration activities?
	- How many hazardous fuels reduction projects have been implemented in connection with a forest restoration project?
4. Reducing Structural Ignitability	- What kind of resource losses (e.g. homes, property, infrastructure) occurred from wildfires in the previous year?
	- Are the current codes and regulations for wildfire hazard adequate? If not, are there efforts to change or update them? Are there action items in the CWPP to develop codes and recommendations?
	- Has the public knowledge and understanding about structural ignitability been increased by strategies adopted in the CWPP? Have homeowners been educated on how to reduce home ignitability, and are they replacing flammable building components with non-flammable materials?
	- How many Firewise Communities have been recognized? How many citizens, neighborhoods, or communities have taken action to increase the resilience of their structure to fire?
	- How has the availability and capacity of local fire agencies to respond to wildland and structural fires improved or changed since the CWPP was developed?
5. Education and Outreach	- What kind of public involvement has the CWPP fostered? Examples include public education, household visits, demonstration projects, etc.
	- Has a change in public awareness about wildfire resulted from the plan?
	- What kinds of activities have citizens taken to reduce wildfire risk?
6. Emergency Management	- Is the CWPP integrated within the county or municipal Emergency Operations Plan?
	- Does the CWPP include an evacuation plan? If yes, has it been tested or implemented since the CWPP adoption?
	- Is the CWPP aligned with other hazard mitigation plans or efforts?

B. HAZARD MITIGATION PLANNING COORDINATION

In 2005 Mason County Emergency Management produced a hazard mitigation plan through contract and coordination with WMSRDC. In order for the county to obtain federal emergency funding from FEMA, the county plan must be reviewed and updated every five years. The update process began in 2012 and was completed in 2015.

The continual maintenance of this CWPP and coordination with the WMSRDC will ensure cohesive planning strategies into the future. WMSRDC should be notified of any changes to the Mason County CWPP so changes can be actively coordinated with the updating of other regional planning efforts and legislative actions.

The development of this CWPP aligns with many of the Goals and Objectives of the Mason County Hazard Mitigation Plan:

Mason County Hazard Mitigation Plan Goals & Objectives

GOAL 1. Promote growth in a sustainable, hazard-free manner.

Objective 1.1. Incorporate hazard provisions in building code standards, ordinances, and procedures.
Objective 1.2. Incorporate hazard mitigation into land use and capital improvement planning and development activities.
Objective 1.3. Incorporate hazard mitigation into existing land use regulation mechanisms to ensure that development will not put people in danger or increase threats to existing properties.
Objective 1.4. Research, recommend, adopt and enforce other plans and ordinances that protect natural resources so that they can, in turn, provide hazard protection.

GOAL 2. Protect existing and new properties.

Objective 2.1. Use the most cost-effective approaches to keep hazards away from existing buildings and facilities.
Objective 2.2. Use the most cost-effective approaches to protect existing buildings and sites from hazards.
Objective 2.3. Maximize insurance coverage to provide financial protection against hazard events.
Objective 2.4. Maximize the resources for investment in hazard mitigation, including the use of outside sources of funding.

GOAL 3. Protect public health and safety.

Objective 3.1. Assure that threat recognition (watches) and warning systems are adequate and appropriate and that they utilize the latest technology.
Objective 3.2. Protect infrastructure and services.
Objective 3.3. Build and support local capacity, commitment and partnerships to continuously become less vulnerable to hazards.
Objective 3.4. Enlist support of committed volunteers to safeguard the community before, during, and after a disaster.

GOAL 4. Increase public understanding, support, and participation in hazard mitigation.

Objective 4.1. Heighten public awareness of the full range of existing natural and man-made hazards and actions they can take to prevent or reduce the risk to life or property from them.
Objective 4.2. Encourage local communities, agencies, organizations and businesses to participate in the hazard mitigation process.
Objective 4.3. Encourage cooperation and communication between planning and emergency management officials.

C. ECOLOGICAL MONITORING

A critical outcome related to CWPPs is related to the change in fire behavior, as affected by the number and type of fuels treatments that occur as a result of priorities identified within the CWPP. The HFRA (Section 102(g)(5)) instructs the USFS and DOI to establish a collaborative multiparty monitoring, evaluation, and accountability process when significant interest is expressed in such an approach.

Multiparty monitoring gives communities an opportunity to assess environmental, social, and economic outcomes related to fuels reduction projects. Multiparty monitoring also builds trust and provides an opportunity for residents to learn about fire-adapted ecology. The USFS Collaborative Forest Restoration Program (CFRP) in the Southwest offers a set of guidelines for monitoring community-based forest restoration. Communities engaged in ecological monitoring of hazardous fuels reduction projects can use these guidelines. They provide an overview of the multiparty monitoring process, ecological and socioeconomic goals and indicators, and examples of measures, data sources, and tools that can be used in conducting this kind of monitoring. Additional information about the CFRP, including an overview, guidance, and training materials, is available online at http://www.fs.fed.us/restoration/CFLRP/index.shtml.

There are also tools used by state and federal agencies to conduct ecological monitoring and monitor maintenance of treated areas. One such program is the Fire Effects Monitoring and Inventory Protocol (FIREMON). FIREMON is an agency-independent plot-level sampling system designed to characterize changes in ecosystem attributes over time https://www.frames.gov/partner-sites/firemon/firemon-home/.

Other methods for conducting ecological monitoring for fuels reduction projects may include using photo points, modeling changes in fire behavior, and measuring change in fire regime and condition class. There are a wide range of approaches to ecological monitoring; FIREMON and other modeling systems are mostly within federal purview, but community organizations and citizens have many monitoring options available and simple methods like comparing photo points and conducting vegetation surveys that are valuable and important.

Appendix A

LOCAL FIRE DEPARTMENT PROFILES

A. Branch Fire Department

Chief: Steve McVicker
Number of part-paid firefighters: 13
Number of volunteer firefighters: 0
Inventory of major equipment:

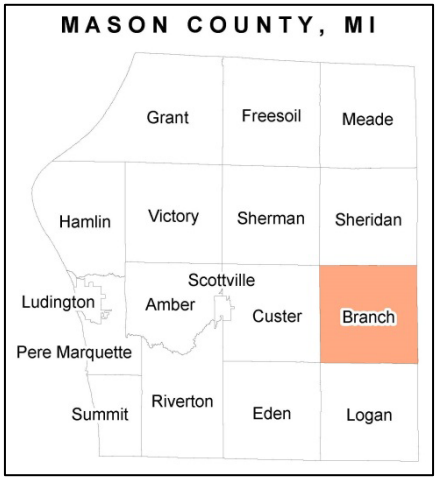
	Type	Year	Condition
2511	Engine, 1000 Gal, 1200 GPM	1998	Good
2521	Tanker, 2000 Gal	2002	Good
2541	Rescue Unit, 1 Ton Truck, Medical & Woods Fires	1998	Fair
2531	Jeep, Woods Fires	1952	Runs well
2561	Polaris Ranger, Rescue & Woods Fires	2008	Good

Mutual Aid Agreements:
- Mason County Rural Fire Authority
- Western Authority (3 departments)
- Lake County
- Michigan DNR
- US Forest Service

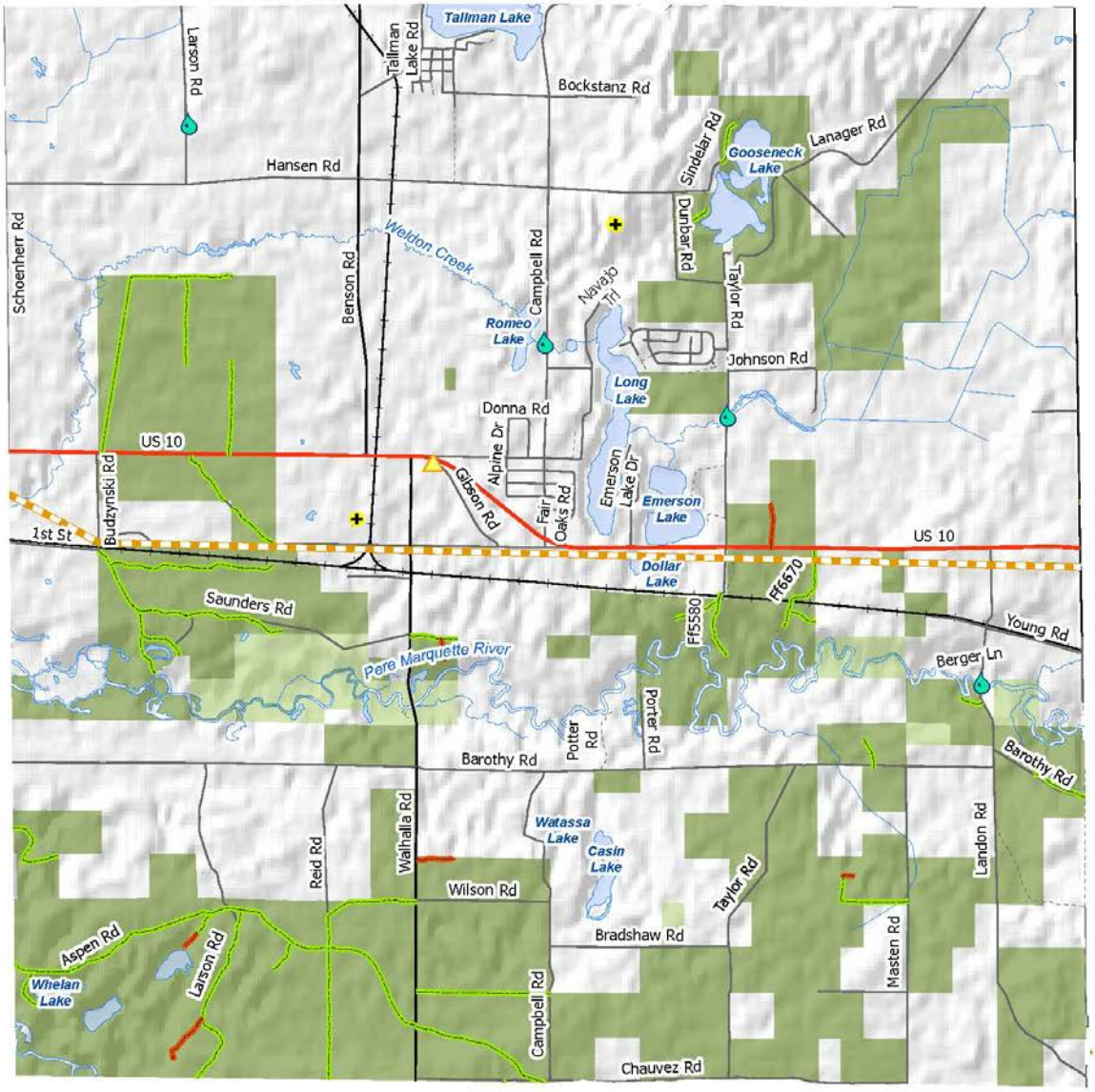
Response Capabilities and Services:
- Fire
- Medical first response

Community Outreach and Education:
Pamphlet distribution at public meetings.

General Description:
The Branch Township Fire Department provides fire protection to Branch Township. This area is mainly forested, with areas of Manistee National Forest and residential developments tucked around inland lakes and scattered within forested areas. Wildland-urban interface areas are common due to the mixture of residential areas and forests. Water sources for fire suppression include two dry hydrants, an irrigation well, and a draft side on the Pere Marquette River. Numerous access routes are in need of improvement to enhance access for first responders. One such area is Ridge Road along the north bank of the Pere Marquette River east of Walhalla Road.



Branch Township Fire Department
District Base Map



State Trunk Line
Primary/Major Rd
Minor/Local Rd
Unpaved/Undefined Rd
Railroad
Forest Service Rd-Open
Forest Service Rd-Closed

Fire Station
Communication Tower
Water Supply
Pipeline
Federal Land
State Land

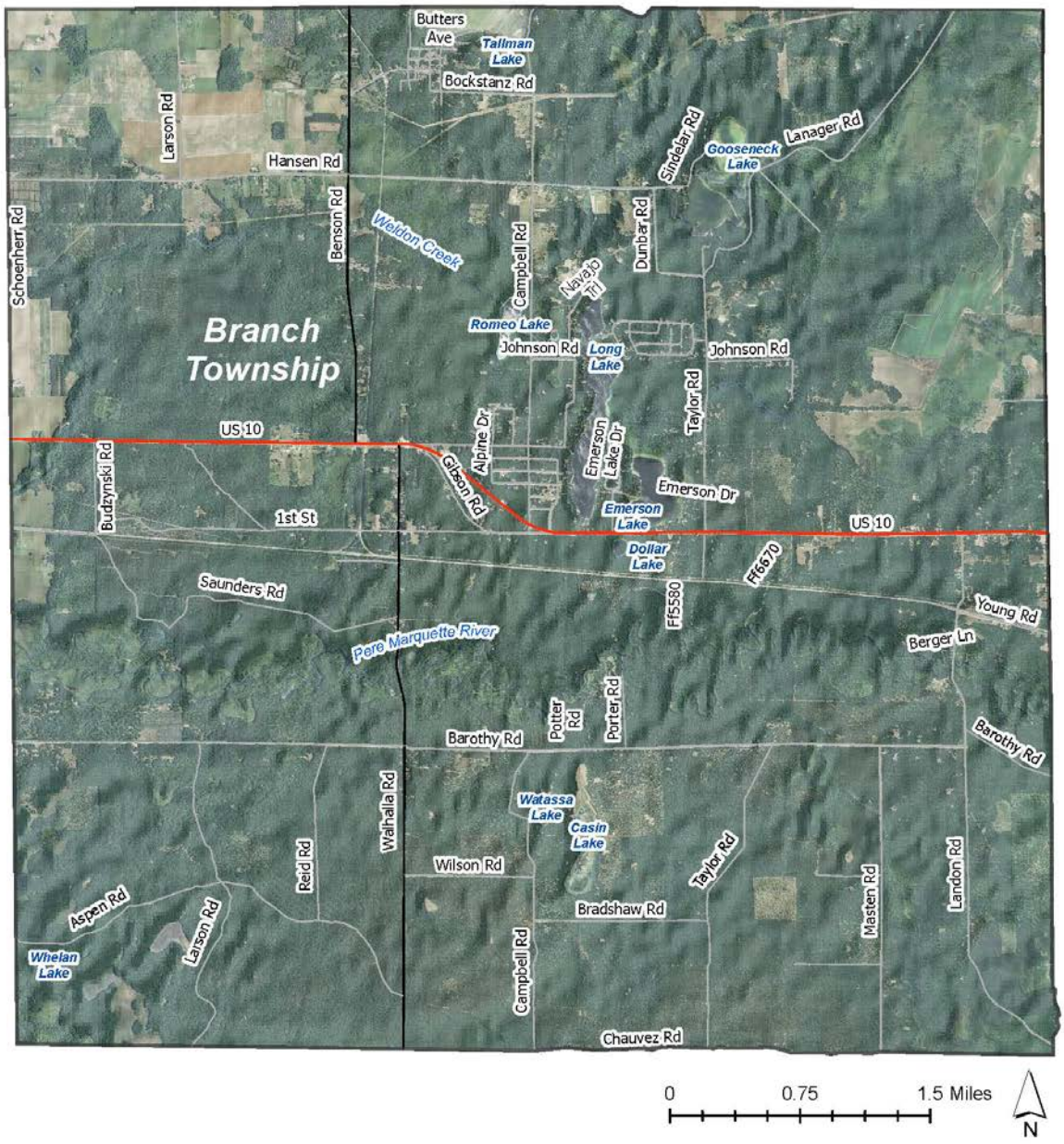
0 0.5 1 Miles

N

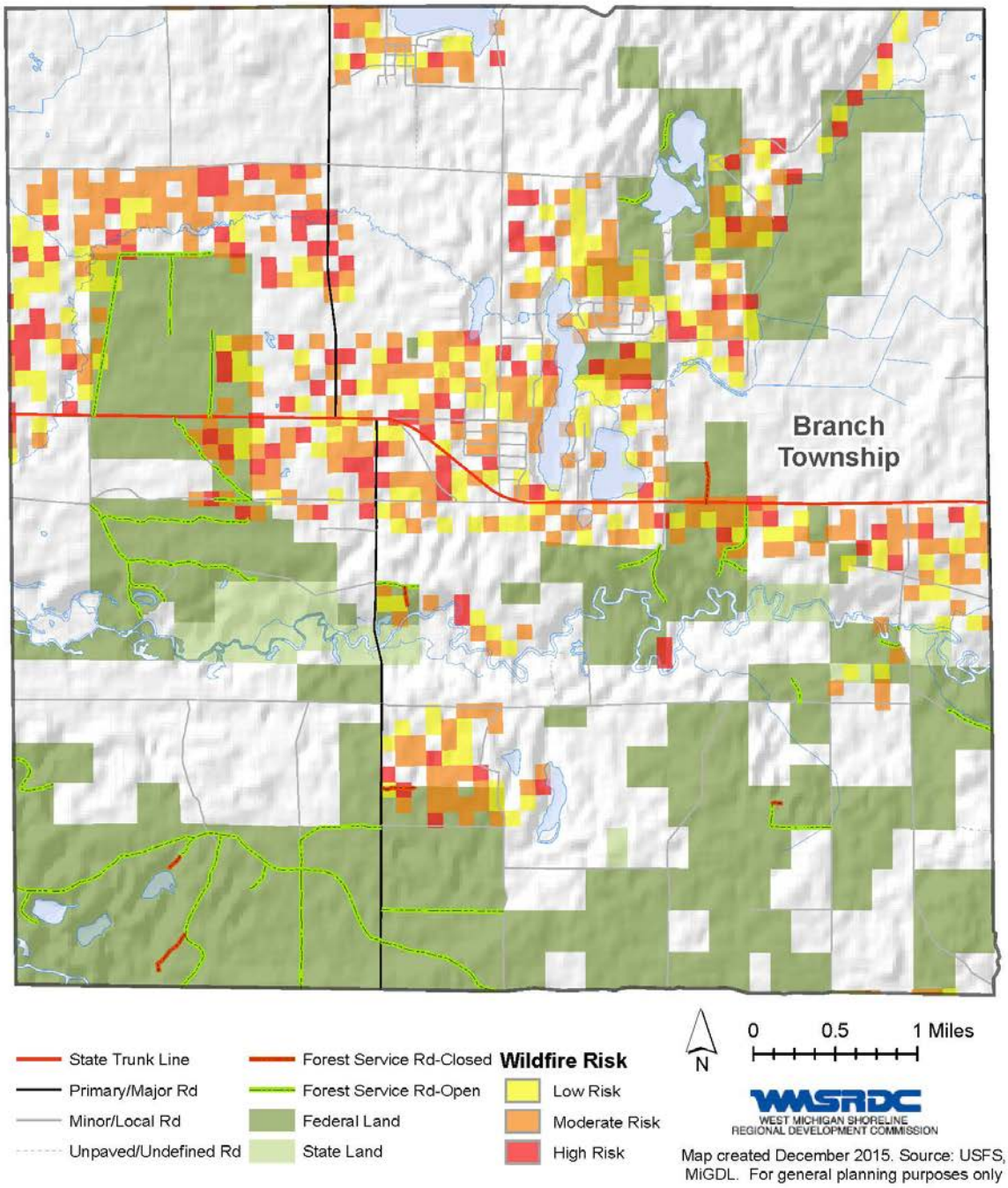
WASRDC
WEST MICHIGAN SHORELINE REGIONAL DEVELOPMENT COMMISSION

Map created January 2016
Sources: USGS National Map,MI DEQ Environmental Mapper, USFS, MI DNR, ESRI

Branch Fire Department
Aerial Imagery and Relief



Branch Township Fire Department
WUI Wildfire Risk Analysis



B. Carr Fire Department

Chief: Andy LaPointe
Number of paid firefighters: 0
Number of volunteer firefighters: 20
Inventory of major equipment:

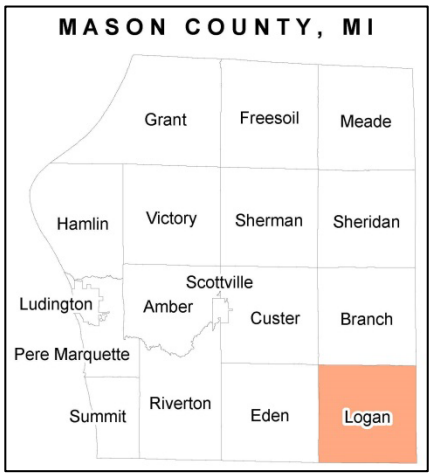
Type	Year	Notes
Engine (pumper)	1989	GMC Topkick, 750 Gal, 1250 GPM, 20'6" Hose, 750' 2.5" Hose, 1000' 1.75" Hose, 400' 1" Hose, 3 Personnel, 2 Fixed Lighting Towers
Grass/Brush/Wildfire Rig	1973	300 Gal, 20 GPM, 400' Hard Rubber Reel Hose; 6 Indian Back-packs; Chainsaw, 3 Personnel
Medical First Response Vehicle	2003	General Medical Supplies, 2 Air Packs, Generator, 6 Personnel
Command Vehicle	2010	High Band Radio, 800MHZ Radio, Maps, Transports ORV
Water Tender (Tanker)	2002	Hard Rubber Reel Hose
Off Road Vehicle	2010	Kawasaki Mule, 50 Gal Tank Fire Skid, 6 Personnel, Single Patient Transport, First Aid Bag

Mutual Aid Agreements:
- Neighboring Departments
- Lake Township (Lake County)
- Webber Township (Lake County)

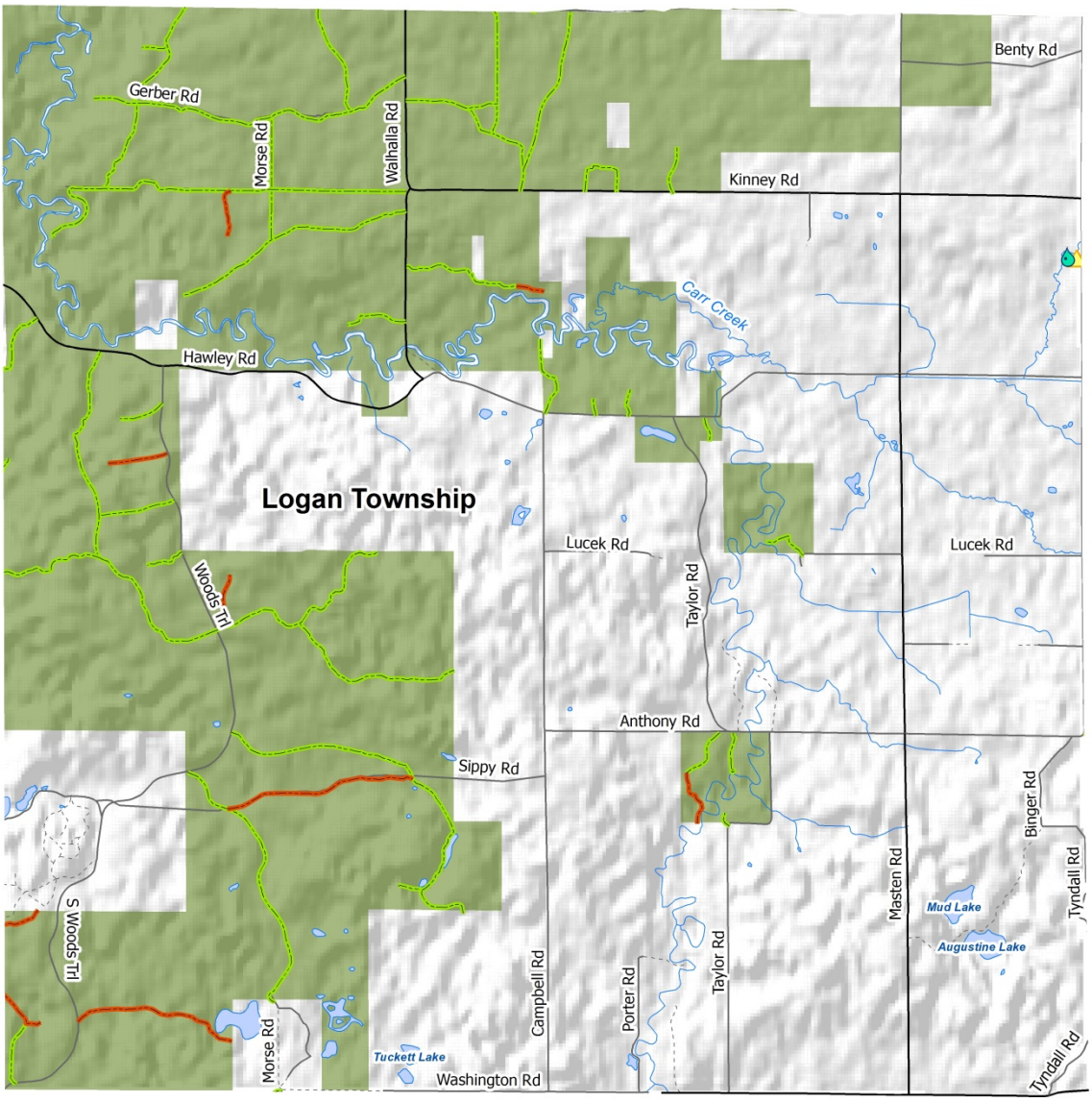
Response Capabilities and Services:
- Medical First Responders
- Fill site at station (150 GPM)
- Drafting capability for river/lake filling
- ORV for medical/fire use/search & rescue

Response Capabilities and Services:
- Fireman's Ball, Springtime
- Harvest Party, September (community involved)

General Description:
The Carr Fire Department area coincides with the boundaries of Logan Township in the southeast corner of Mason County. Most of the land in this area is covered by forest. Areas of the Manistee National Forest owned by the US Forest Service are common in northern and western portions of the area. Potential Wildland-urban interface areas have been identified in the district's eastern half, with only isolated areas adjacent to national forest parcels. In addition, residential areas bordering the Manistee National Forest along the north side of Kinney Road between Walhalla Road and Masten Road have been identified to have particular wildfire risk.



Carr Fire Department
District Base Map



Forest Service Rd-Closed
Forest Service Rd-Open
Primary/Major Rd
Minor/Local Rd
Unpaved/Undefined Rd
Federal Land
River
Lake
Fire
Water Supply

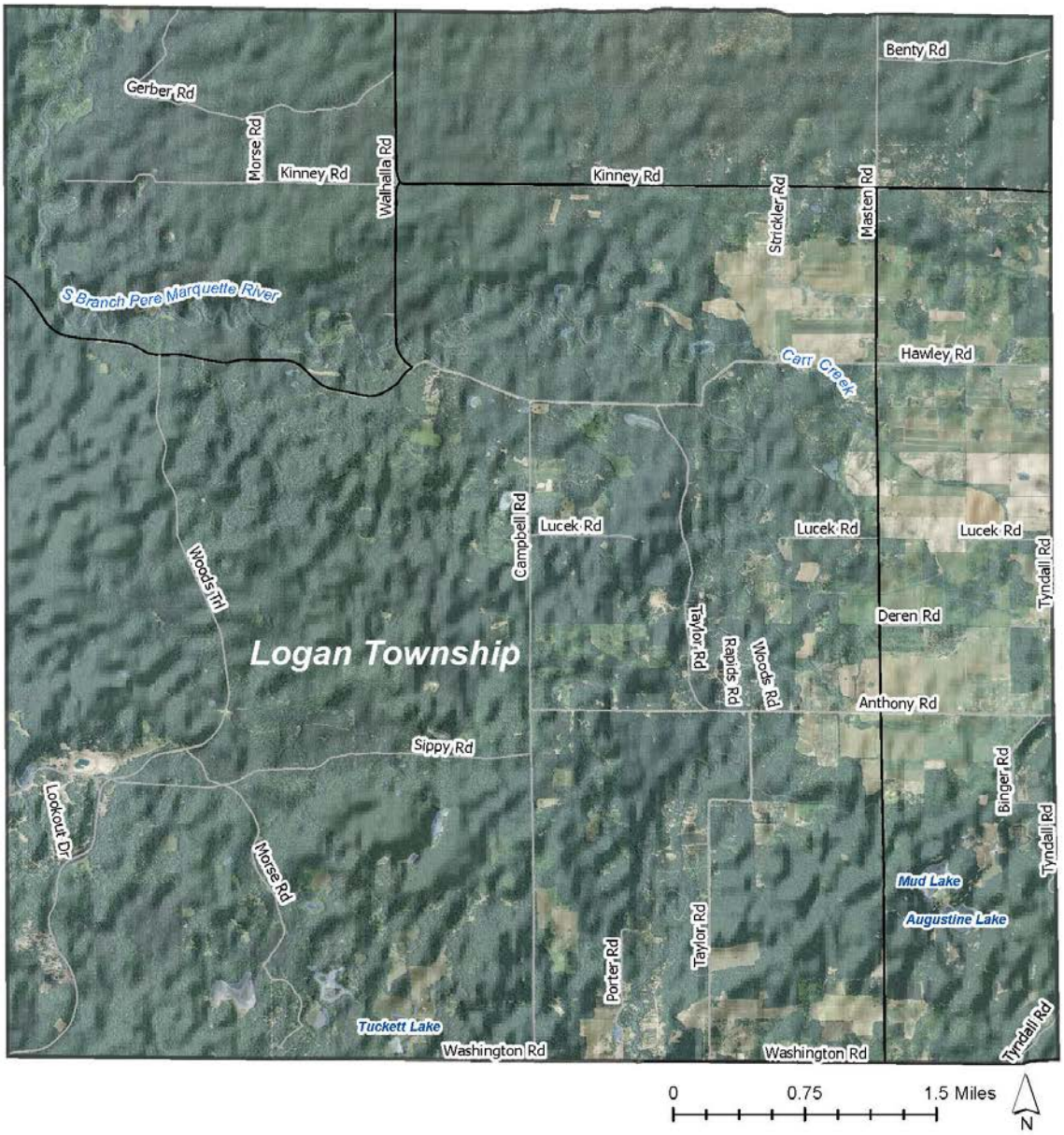
0 0.45 0.9 Miles

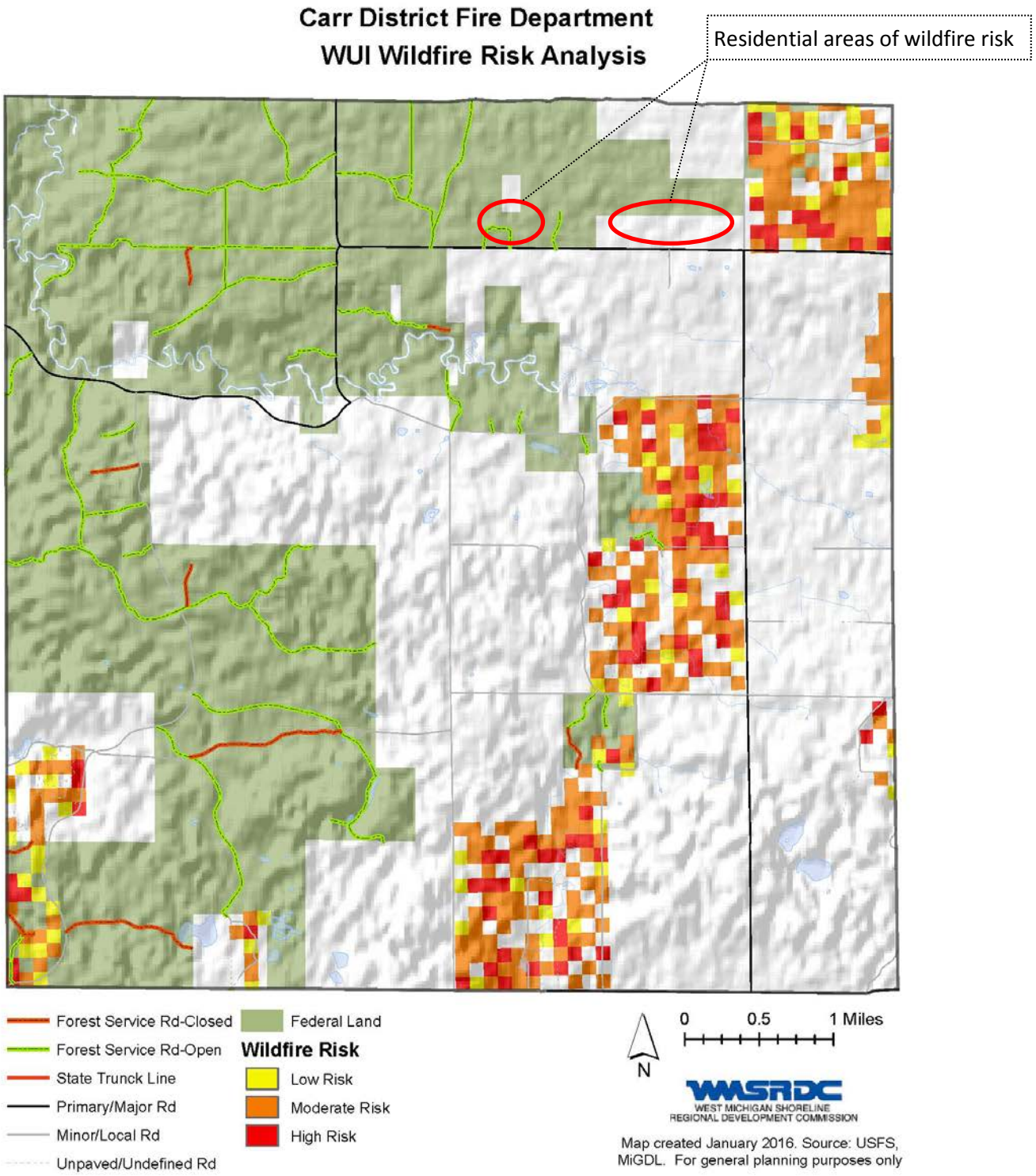
N

WSRDC
WEST MICHIGAN SHORELINE REGIONAL DEVELOPMENT COMMISSION

Map created January 2016
Sources: USGS National Map,MI DEQ Environmental Mapper, USFS, MI DNR, ESRI

Carr Fire Department
Aerial Imagery and Relief




Carr District Fire Department
WUI Wildfire Risk Analysis
Residential areas of wildfire risk
Forest Service Rd-Closed
Forest Service Rd-Open
State Trunck Line
Primary/Major Rd
Minor/Local Rd
Unpaved/Undefined Rd
Federal Land
Wildfire Risk
Low Risk
Moderate Risk
High Risk
N
0
0.5
1 Miles
WEST MICHIGAN SHORELINE REGIONAL DEVELOPMENT COMMISSION
Map created January 2016. Source: USFS, MiGDL. For general planning purposes only

C. Custer Fire Department

Chief: Larry Crawford
Number of part-paid firefighters: 25
Number of volunteer firefighters: 0
Inventory of major equipment:

Year	Type	Condition
1999	Dodge Brush Truck	Good
1998	Pumper	Good
2002	Tanker	Good

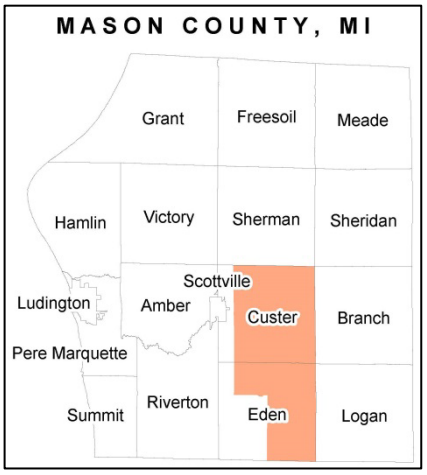
Mutual Aid Agreements:

- Mason County Rural Fire Authority
- Manistee County
- Oceana County
- Lake County
- Michigan DNR
- US Forest Service

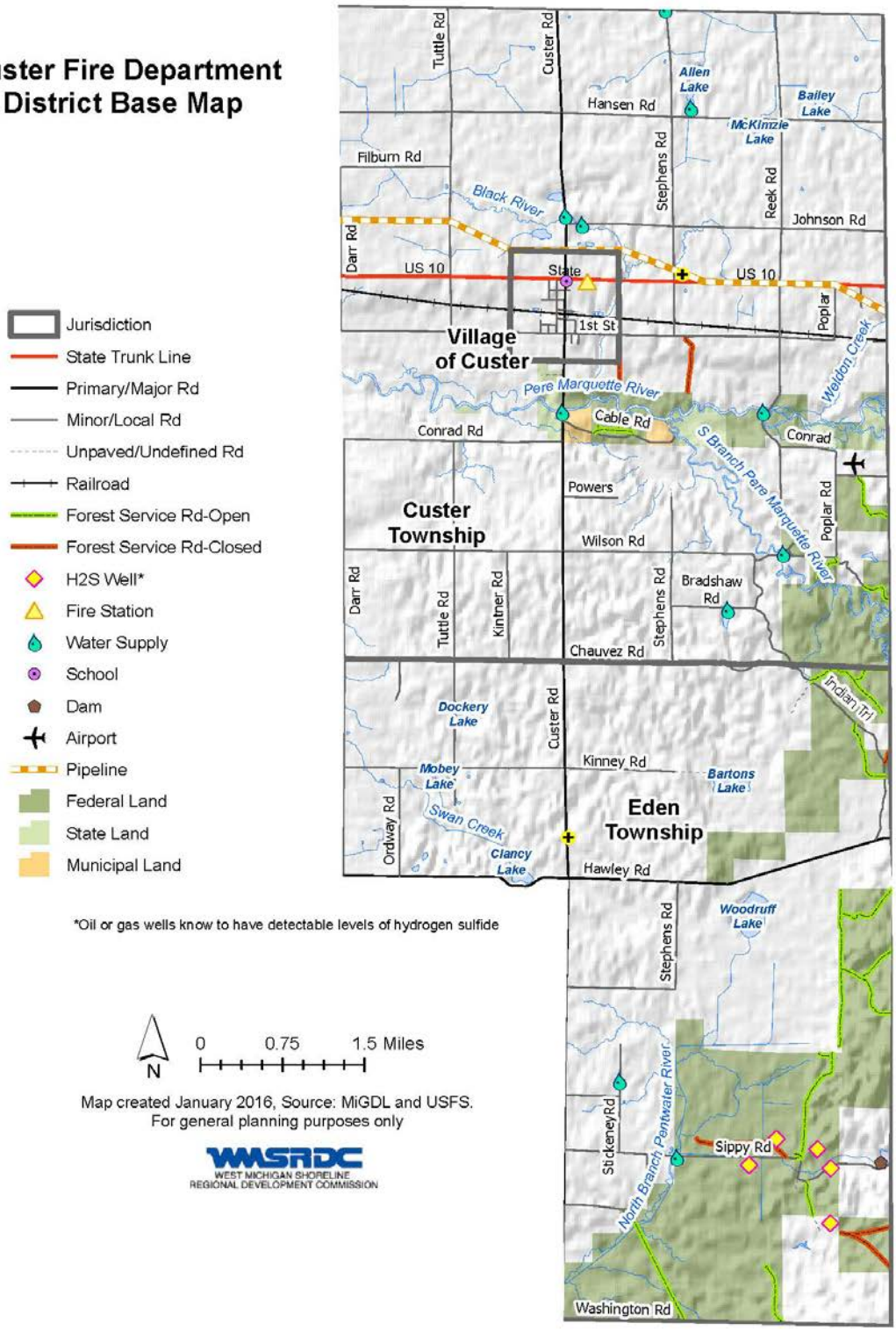
Response Capabilities and Services:
- Fire
- EMS
- Jaws
- Custer Fire is paged by Oceana-Mason 911.

Community Outreach and Education:
Fire Prevention for elementary schools.

General Description:
The Custer Fire Department serves Custer Township and much of Eden Township. North of the Pere Marquette River, the landscape is mainly rural with agriculture and scattered forests. South of the river, the land is typically forested with areas of agriculture. Sections of the Manistee National Forest are found along and south of the river east of Custer Road. Potential wildland-urban interface areas are most prominent in and around the Village of Custer and in the western portion of Custer Township. Water sources for fire suppression are well-distributed throughout the area, and there is a cluster of oil/gas wells known to have detectable levels of hydrogen sulfide in the southern portion of Eden Township.



Custer Fire Department District Base Map



- Jurisdiction
- State Trunk Line
- Primary/Major Rd
- Minor/Local Rd
- Unpaved/Undefined Rd
- Railroad
- Forest Service Rd-Open
- Forest Service Rd-Closed
- H2S Well*
- Fire Station
- Water Supply
- School
- Dam
- Airport
- Pipeline
- Federal Land
- State Land
- Municipal Land

*Oil or gas wells know to have detectable levels of hydrogen sulfide

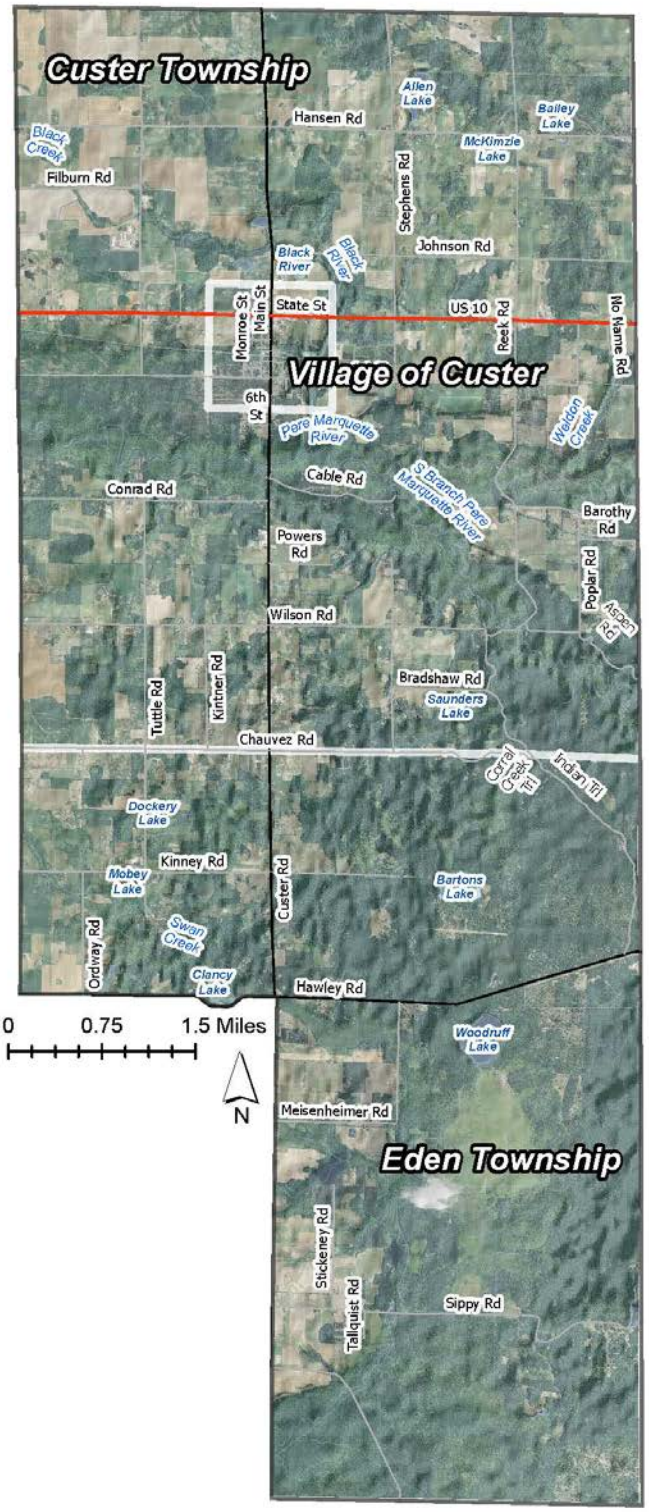
N

0 0.75 1.5 Miles

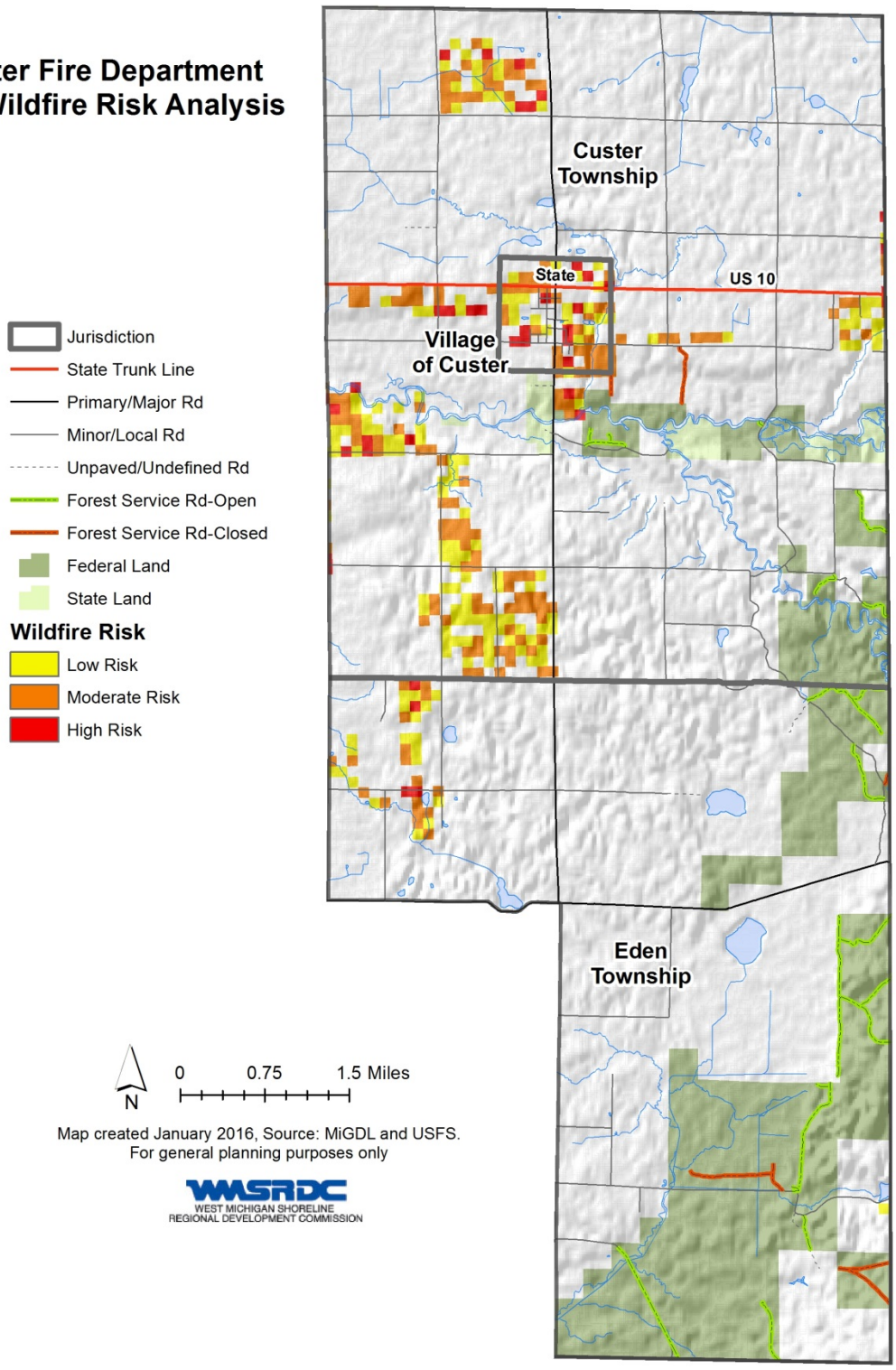
Map created January 2016, Source: MiGDL and USFS.
For general planning purposes only

WMSRDC
WEST MICHIGAN SHORELINE REGIONAL DEVELOPMENT COMMISSION

Custer Fire Department
Aerial Imagery and Relief



Custer Fire Department
WUI Wildfire Risk Analysis



Map created January 2016, Source: MiGDL and USFS.
For general planning purposes only

WMSRDC
WEST MICHIGAN SHORELINE
REGIONAL DEVELOPMENT COMMISSION

D. Free Soil Fire Department

Chief: Vince Williams
Number of part-paid firefighters: 15
Number of volunteer firefighters: 0
Inventory of major equipment:

Type	Year	Notes
Freightliner		Engine (Pumper), 750 Gal, 1,200 GPM, Freightliner
Chevy 1 Ton	1986	Grass/Brush/Wildfire Rig, 200 Gal, 30 GPM
Chevy 1 Ton	1986	Grass/Brush/Wildfire Rig, 240 Gal, 50 GPM
Ford F550		Basic Medical Supplies, Jaws
Freightliner		Water Tender (Tanker), 2000 Gal, 380 GPM
Rescue Boat		16' Inflatable RDC
Kabota		Off Road Vehicle, 75 Gal, 15 GPM

Mutual Aid Agreements:

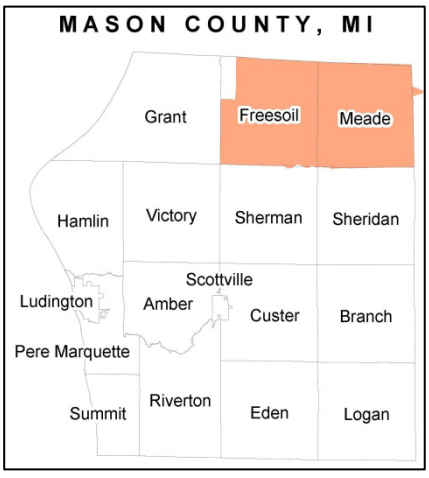
- Stronach Township Fire Department (Manistee County)
- Irons Fire Department (Lake County)
- Filer Township Fire Department (Manistee County)

Response Capabilities and Services:

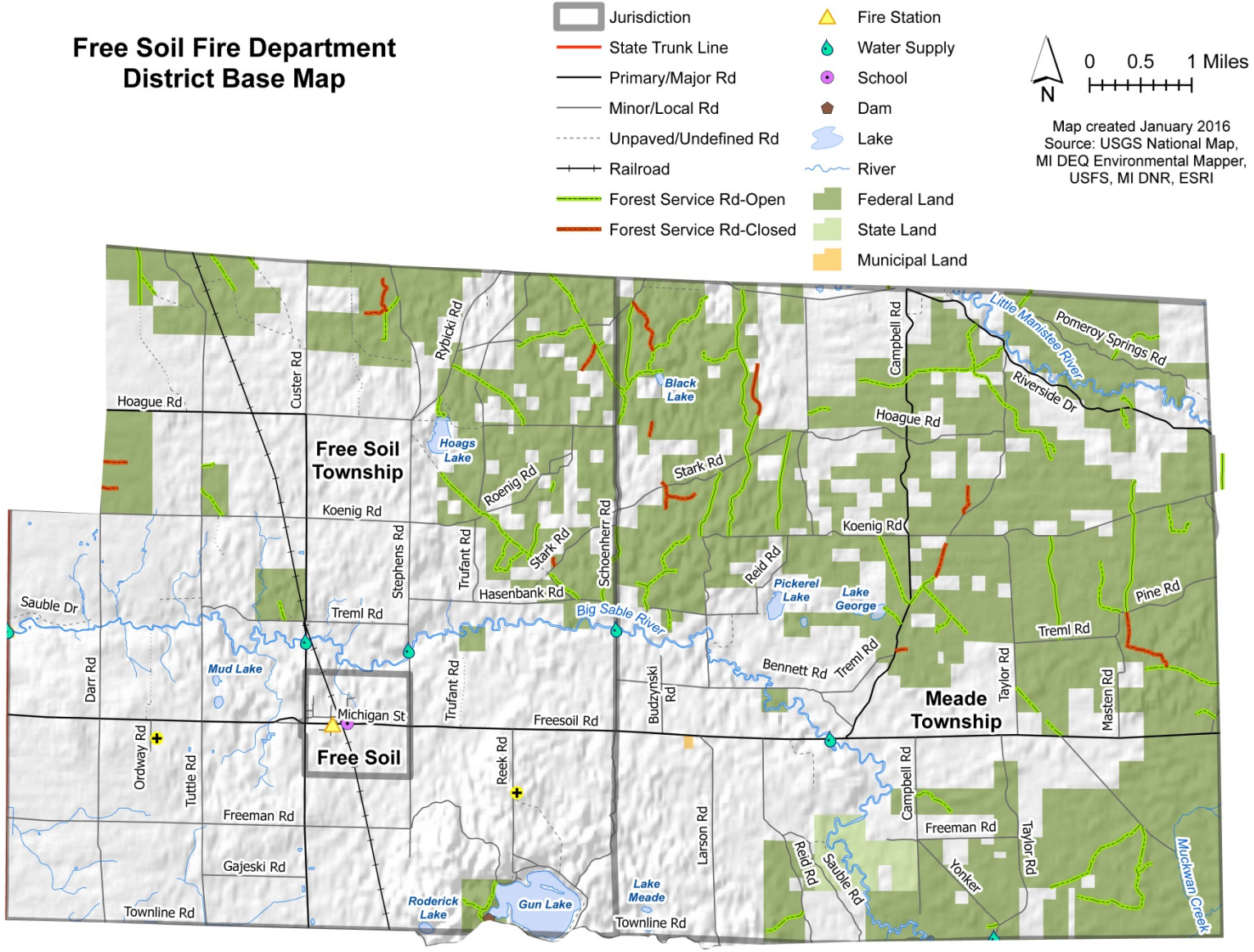
- Structural firefighting
- Wildland firefighting
- MFR medical response
- Jaws
- Ice rescue
- Swift water rescue
- Working on high angle rescue

Community Outreach and Education:
Basic fire prevention and handouts at schools and fundraisers.

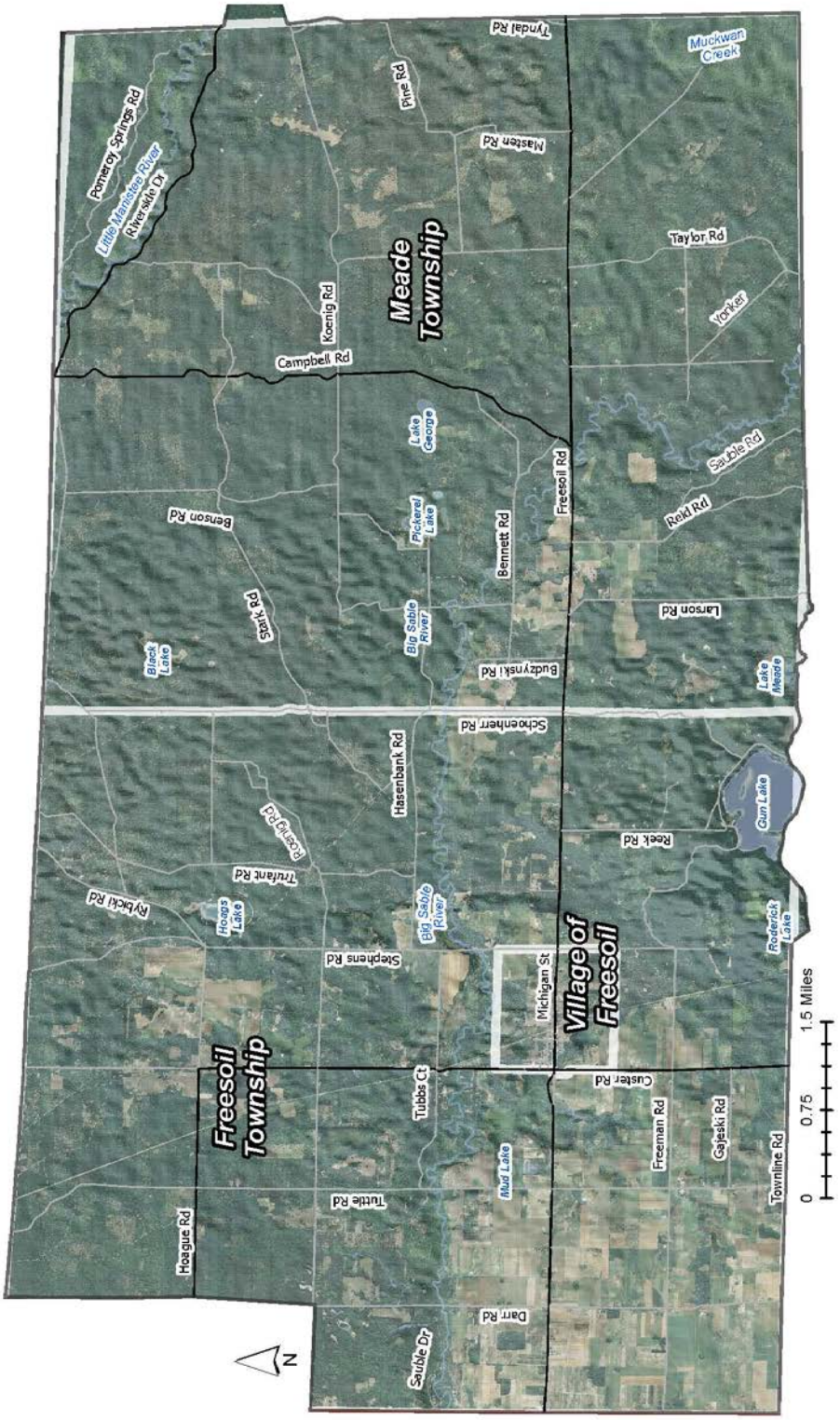
General Description:
The Free Soil Township Fire Department covers the townships of Free Soil and Meade. Much of the area is dense forest containing houses that are only accessible by two-track. About 66 percent of land cover is forest, while the remaining 34% is mostly covered with vegetation, farmland and residential uses. Much of the forestland is owned by the US Forest Service as a part of the Manistee National Forest. Storms over the past ten years have left large amounts of trees and brush throughout. Wildland-urban interface areas are situated in the Village of Free Soil, near Gun Lake, and along the Big Sable and Pere Marquette rivers. Water sources for fire suppression include two dry hydrants along the Big Sable River (one in Free Soil Township and one in Meade Township; and two seasonal draft sites (one on Gun Lake and one on Hoags Lake).



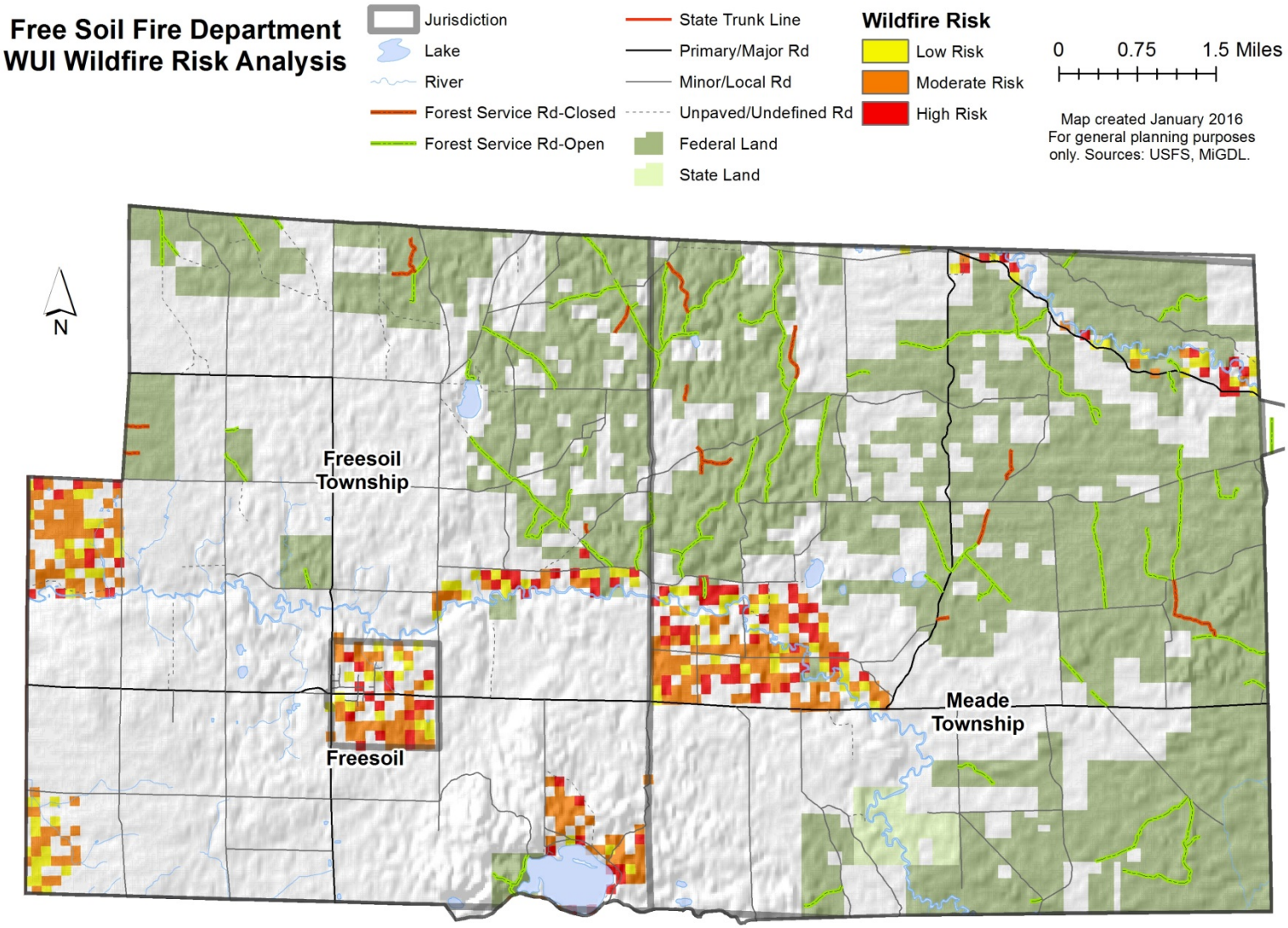
Free Soil Fire Department District Base Map



Free Soil Fire Department
Aerial Imagery and Relief



Free Soil Fire Department
WUI Wildfire Risk Analysis



E. Fountain Area Fire Department

Chief: Roger C. Berndt
Number of part-paid firefighters: 19
Number of volunteer firefighters: 0
Inventory of major equipment:

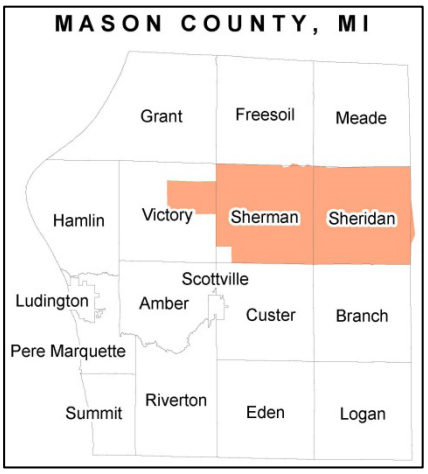
Year	Type	Condition
2002	27-11	Good
1998	27-21	Good
2006	27-41	Good
1978	27-31	Good
2013	Polaris Ranger 27-62	Good

Mutual Aid Agreements:
- Lake County
- Michigan DNR
- US Forest Service

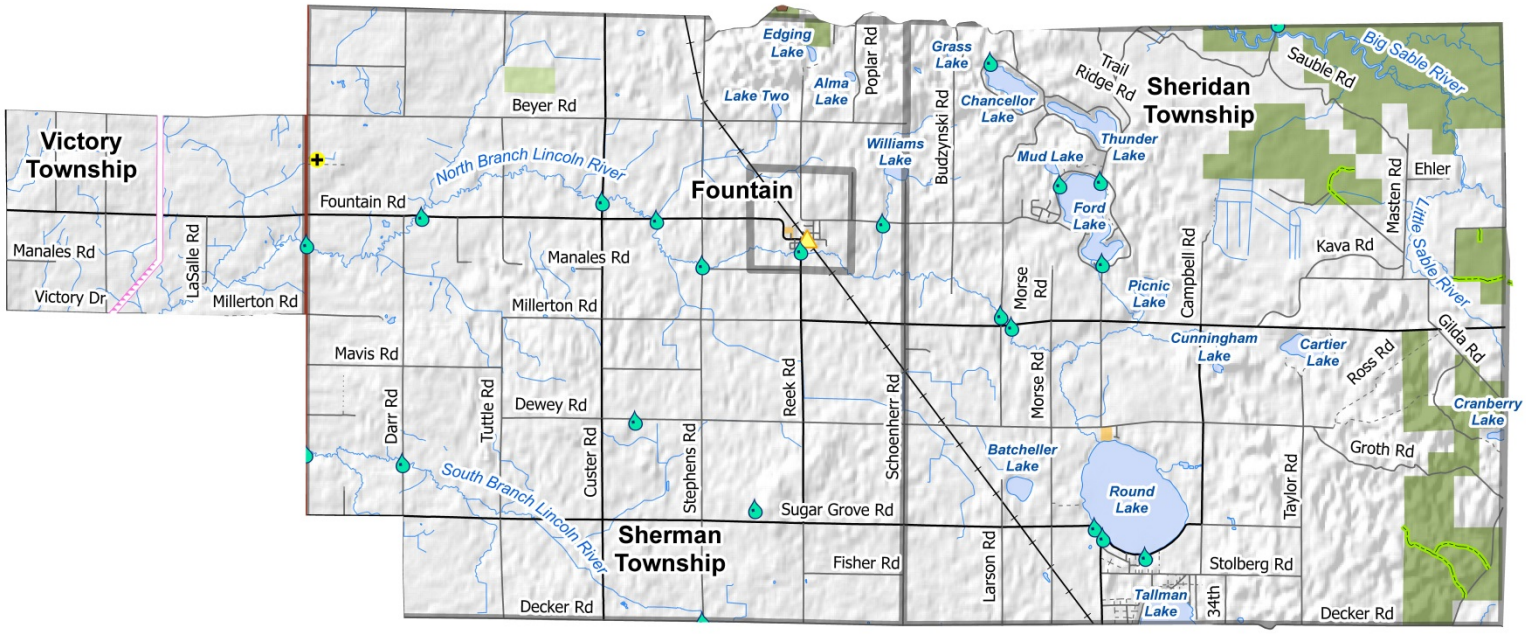
Response Capabilities and Services:
- Fire
- Medical
- Jaws

Community Outreach and Education:
- FiveCAP
- Custer Elementary during Fire Week

General Description:
The Fountain Area Fire Department covers the townships of Sherman, Sheridan, and part of Victory. The landscape contains a mix of lakes and rivers, farmland, forests, residential developments, and seasonal dwellings. Wildland-urban interface areas are generally concentrated in three areas: western Sheridan Township south of Fountain Road; the Village of Fountain; and around lakes in Sheridan Township. There are some areas of the Manistee National Forest in the area, primarily in eastern Sheridan Township. Thanks to the wealth of lakes and streams in the area, there are many sites to draw water for fire suppression.



Fountain Fire Department
District Base Map



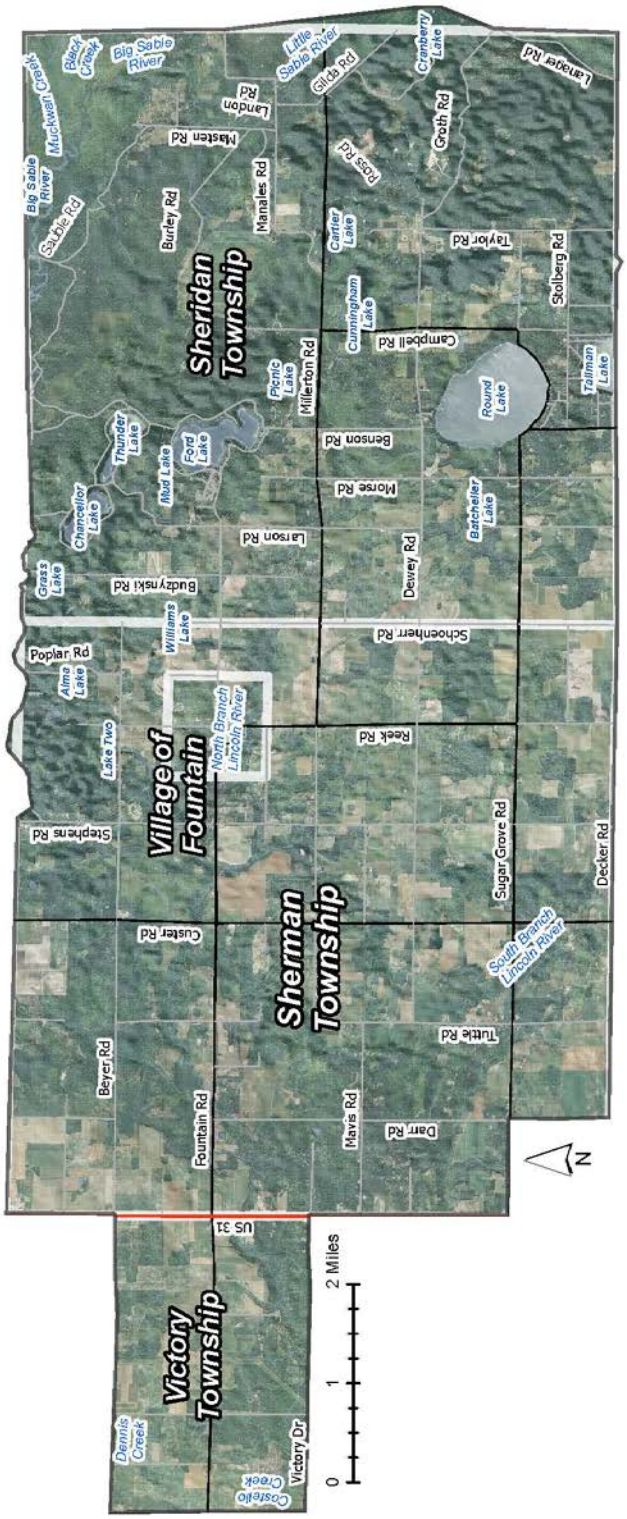
- Jurisdiction
- State Trunk Line
- Primary/Major Rd
- Minor/Local Rd
- Unpaved/Undefined Rd
- Railroad
- Forest Service Rd-Open
- Fire Station
- Water Supply
- Dam
- Lake
- River
- Power Line
- Federal Land
- State Land
- Municipal Land

N

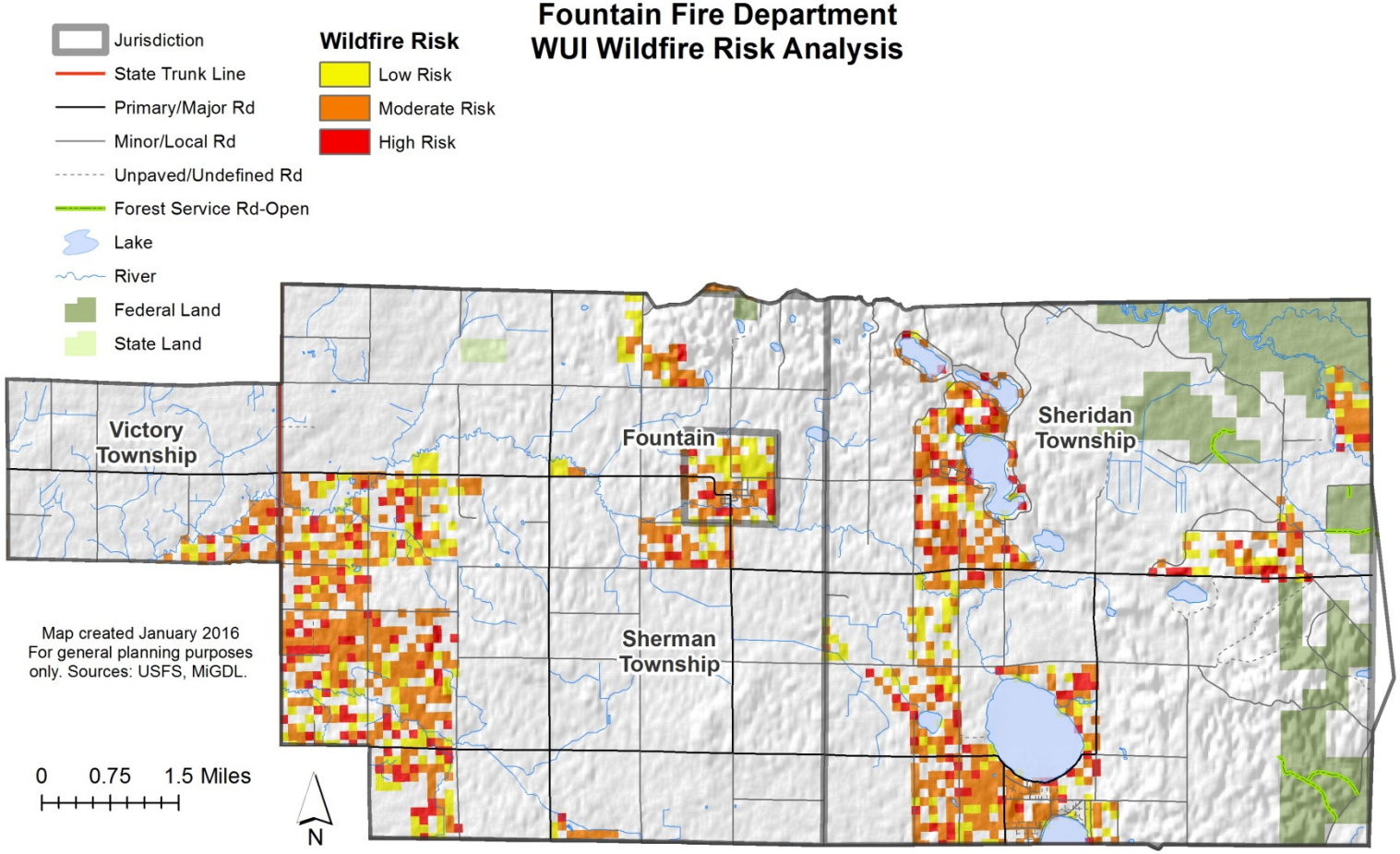
0 0.75 1.5 Miles

Map created January 2016
Source: USGS National Map,
MI DEQ Environmental Mapper,
USFS, MI DNR, ESRI

Fountain Fire Department
Aerial Imagery and Relief



Fountain Fire Department
WUI Wildfire Risk Analysis



F. Grant Fire Department

Chief: Ronnie Melchert II
Number of part-paid firefighters: 15
Number of volunteer firefighters: 0
Inventory of major equipment:

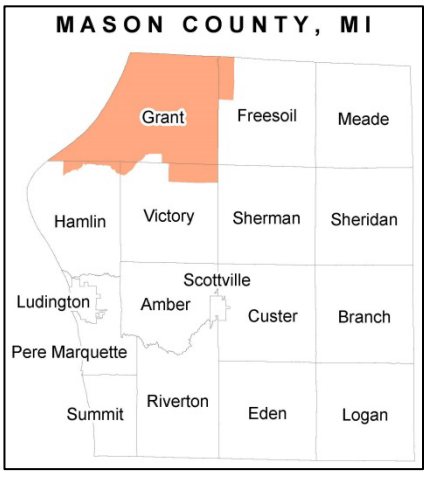
#	Type	Condition
37-11	Engine (1998)	Good
37-21	Tender (2000), 2000 Gal	Good
37-31	Brush (2014), 550 Gal, 10 Gal foam, 4x4	Excellent
37-41	Medical	Good
37-42	Extraction	Excellent
37-61	Kabota on tracks 4x4, Fire/Medical	Excellent
37-62	18' Command Trailer	Excellent

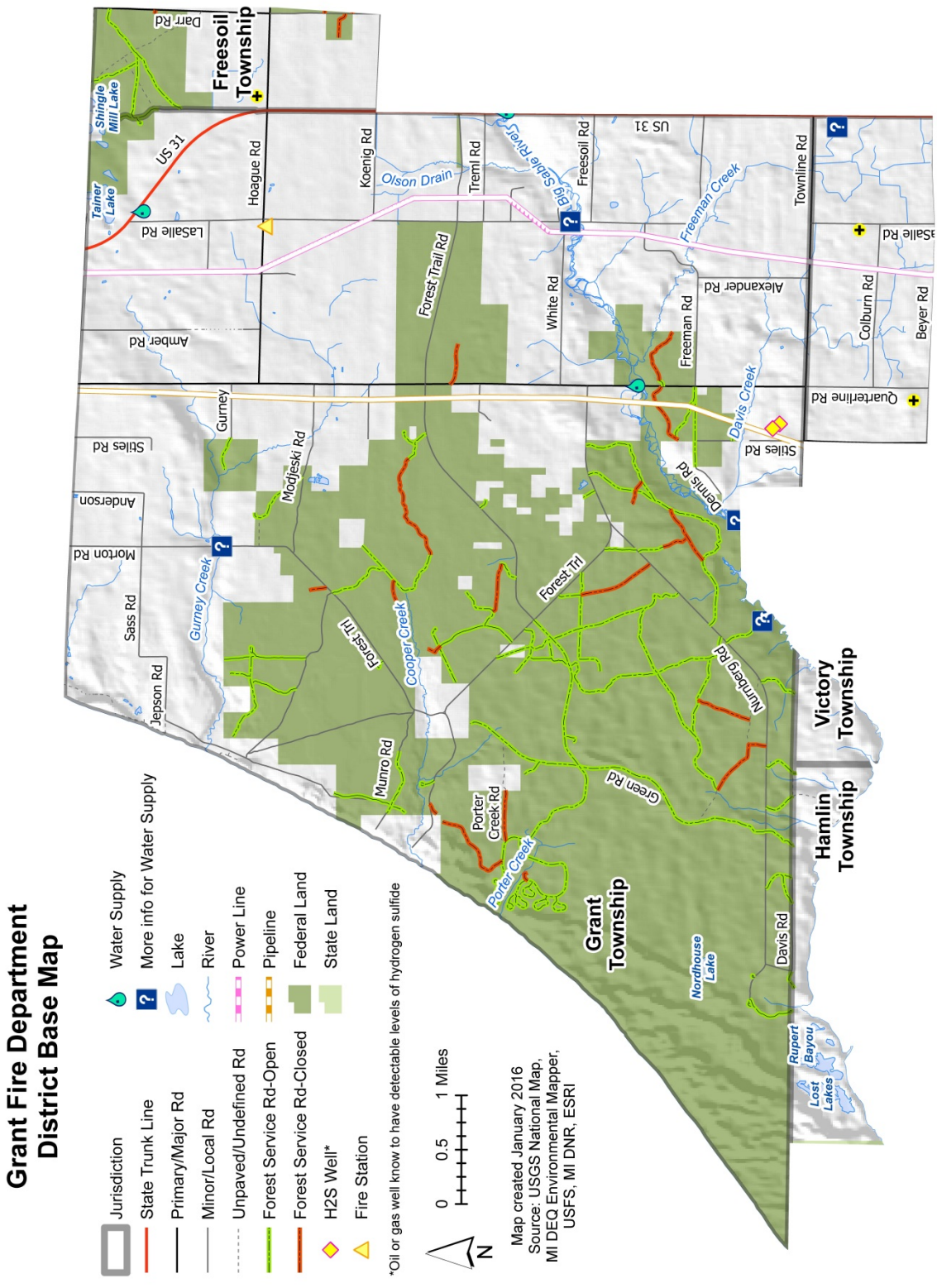
Mutual Aid Agreements:
- Manistee County
- Lake County
- USFS
- MDNR
- Western Fire Authority

Response Capabilities and Services:
- Fire
- Medical
- Jaws
- Ice Rescue

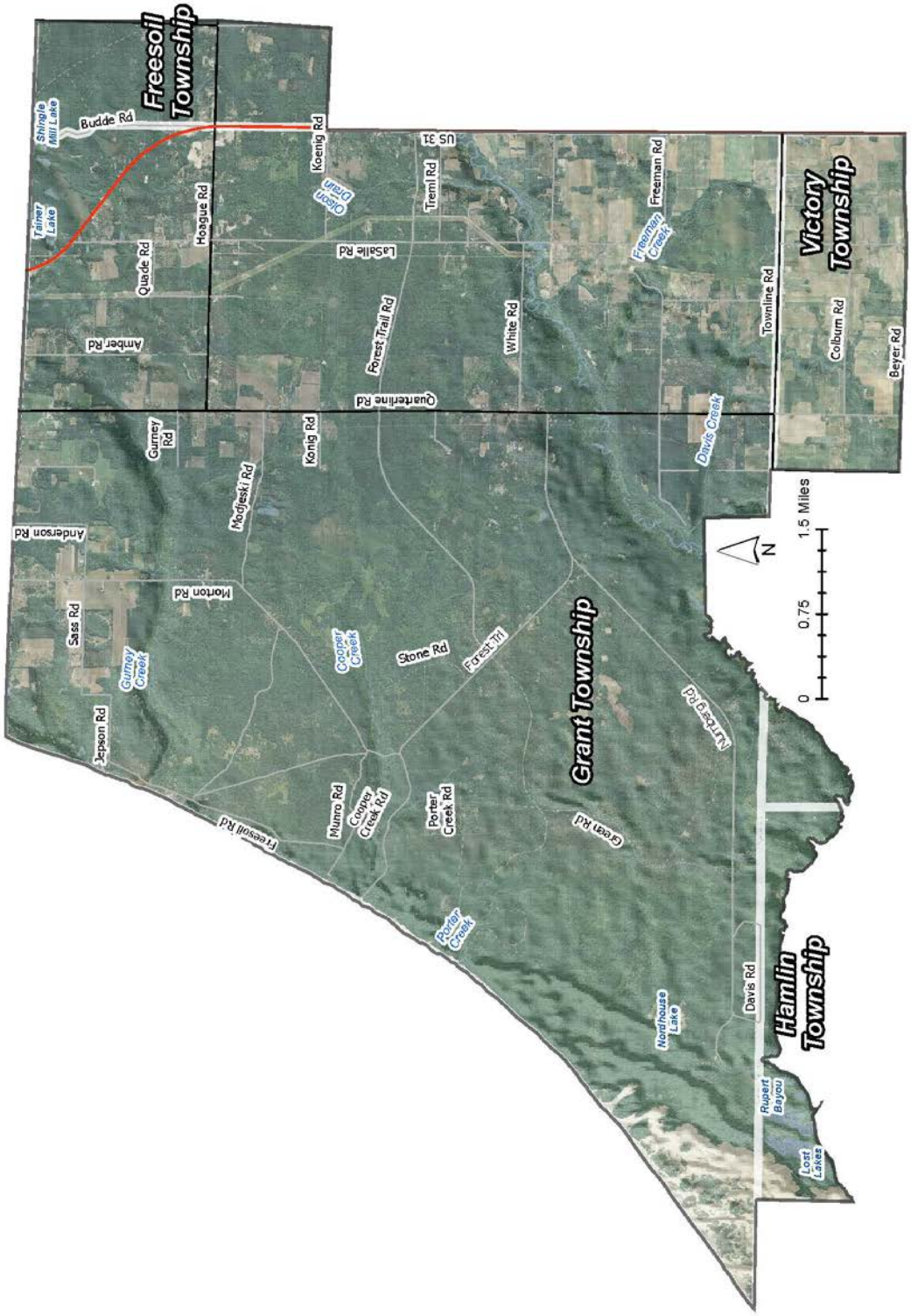
Community Outreach and Education:
- Citizen watch group

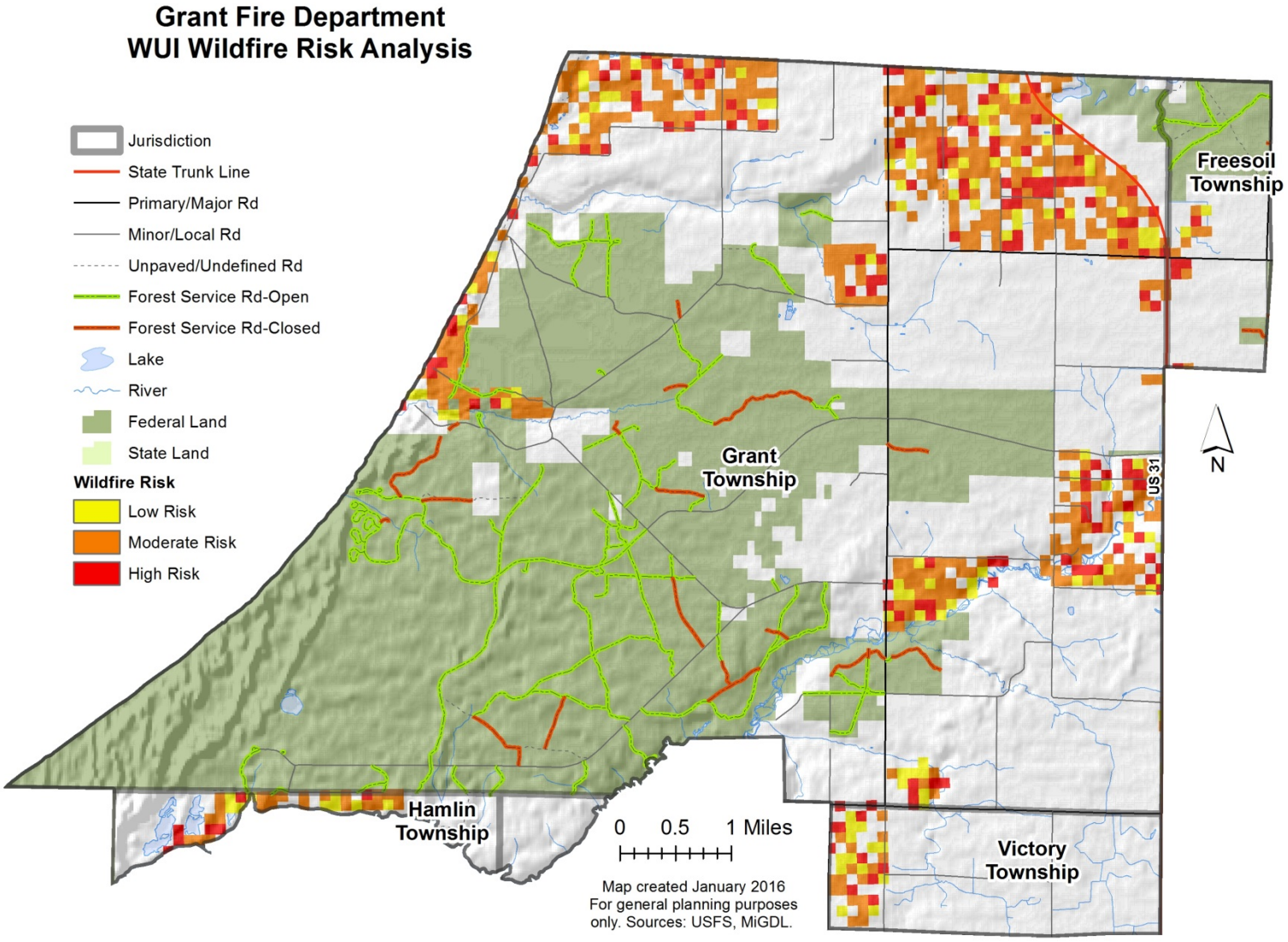
General Description:
The Grant Fire Department covers Grant Township and small portions of Free Soil, Hamlin, and Victory townships. The landscape is heavily forested with numerous pine stands. Much of the area is within the Manistee National Forest, and there are many "no exit" routes are located along the Lake Michigan shoreline. Grant Fire does engage in fuel reduction activities when invited by the US Forest Service, and has an agreement to assist Forest Service with extended attack for wildfires. Wildland-urban interface areas generally coincide with residential developments along the US 31 corridor, Big Sable River, and Lake Michigan shoreline.




Grant Fire Department
District Base Map
Jurisdiction
State Trunk Line
Primary/Major Rd
Minor/Local Rd
Unpaved/Undefined Rd
Forest Service Rd-Open
Forest Service Rd-Closed
H2S Well*
Fire Station
Water Supply
More info for Water Supply
Lake
River
Power Line
Pipeline
Federal Land
State Land
*Oil or gas well know to have detectable levels of hydrogen sulfide
0 0.5 1 Miles
N
Map created January 2016
Source: USGS National Map,
MI DEQ Environmental Mapper,
USFS, MI DNR, ESRI
Grant Township
Hamlin Township
Victory Township
Freesoil Township
Anderson
Stiles Rd
Morton Rd
Sass Rd
Jepson Rd
Gurney
Gurney Creek
Modjeski Rd
Amber Rd
Darr Rd
Shingle Mill Lake
Tainer Lake
US 31
LaSalle Rd
Hoague Rd
Koenig Rd
Olson Drain
Tremi Rd
Forest Trail Rd
Big Sable River
Freesoil Rd
White Rd
Freeman Rd
Alexander Rd
Freeman Creek
Townline Rd
Colburn Rd
Beyer Rd
Quarterline Rd
Davis Creek
Dennis Rd
Forest Trl
Cooper Creek
Munro Rd
Porter Creek Rd
Porter Creek
Green Rd
Nurnberg Rd
Nordhouse Lake
Davis Rd
Rupert Bayou
Lost Lakes

Grant Fire Department
Aerial Imagery and Relief




Grant Fire Department
WUI Wildfire Risk Analysis
Jurisdiction
State Trunk Line
Primary/Major Rd
Minor/Local Rd
Unpaved/Undefined Rd
Forest Service Rd-Open
Forest Service Rd-Closed
Lake
River
Federal Land
State Land
Wildfire Risk
Low Risk
Moderate Risk
High Risk
Freesoil Township
Grant Township
Hamlin Township
Victory Township
US 31
N
0 0.5 1 Miles
Map created January 2016
For general planning purposes
only. Sources: USFS, MiGDL.

G. Hamlin Fire Department

Chief: Steve Vandervest
Number of part-paid firefighters: 15
Number of volunteer firefighters: 0
Inventory of major equipment:

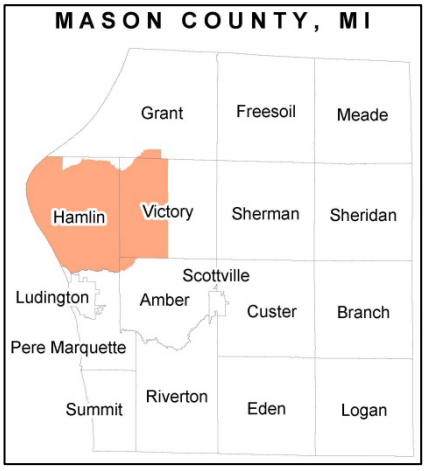
	Type	Condition
22-11	Pumper, 1997	Good
22-12	MIDI Pumper, 2007	Excellent
22-21	Tender, 2002	Good
22-31	Brush, 2009	Excellent
22-41	Med, 2009	Excellent
22-71	Support Truck, 2015	Excellent
	Ranger	
	Boston Whaler	
	Command Trailer	
	Equipment Trailer	

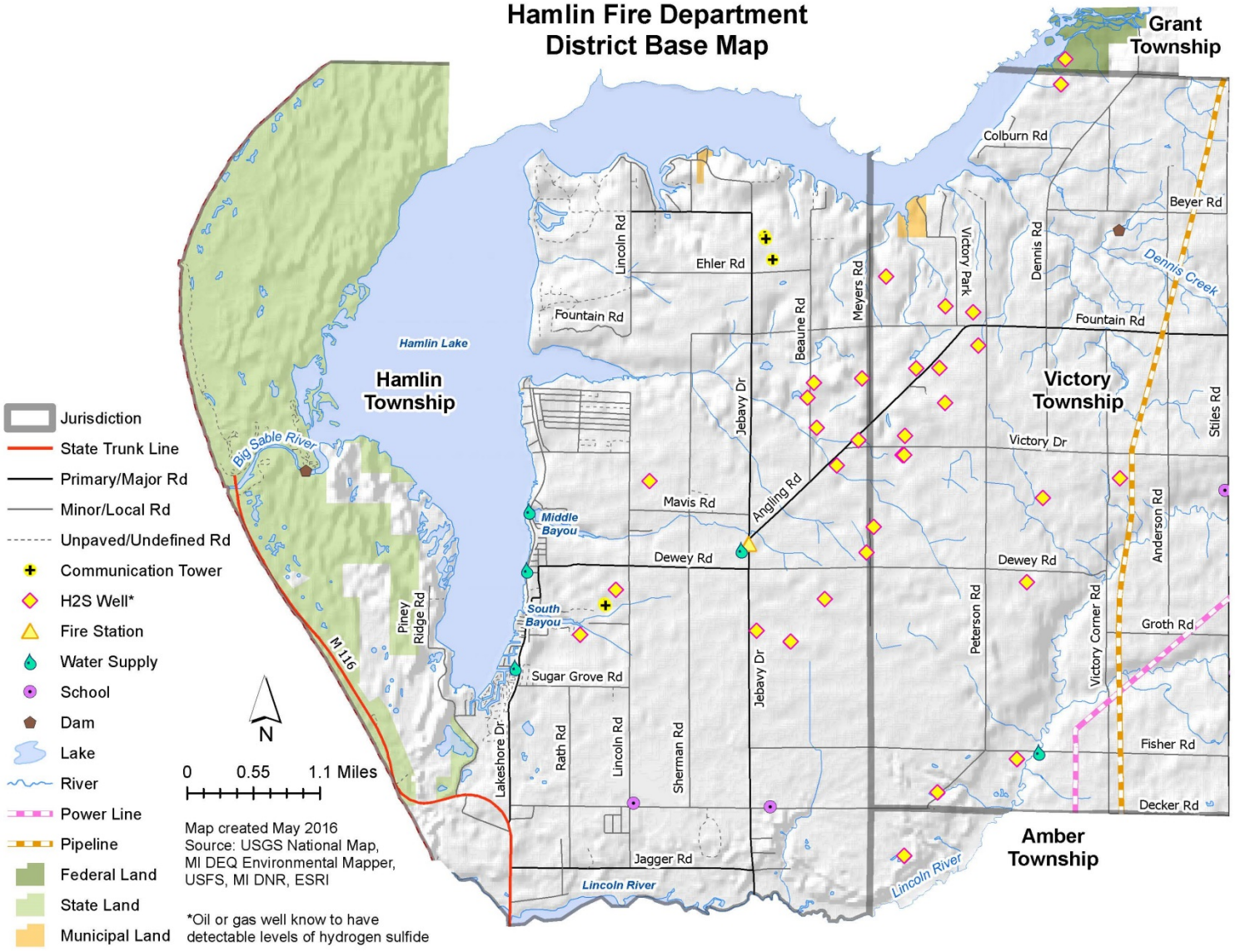
Mutual Aid Agreements:
- Mason County Rural Fire Authority
- US Forest Service

Response Capabilities and Services:
- Fires
- Medical
- Lines Down
- Gas Leaks
- Boat Rescue
- Traffic Control

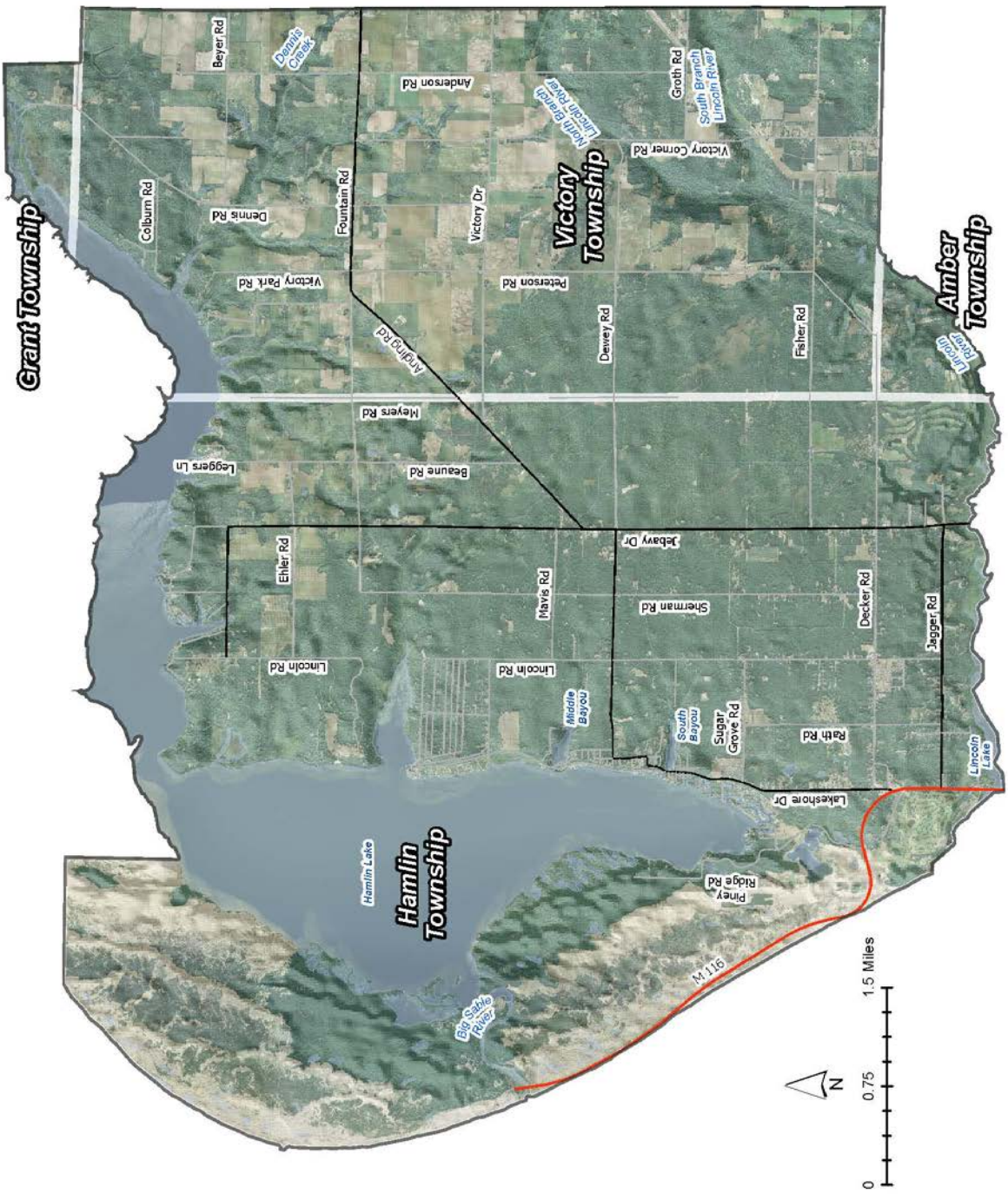
Community Outreach and Education:
School fire prevention

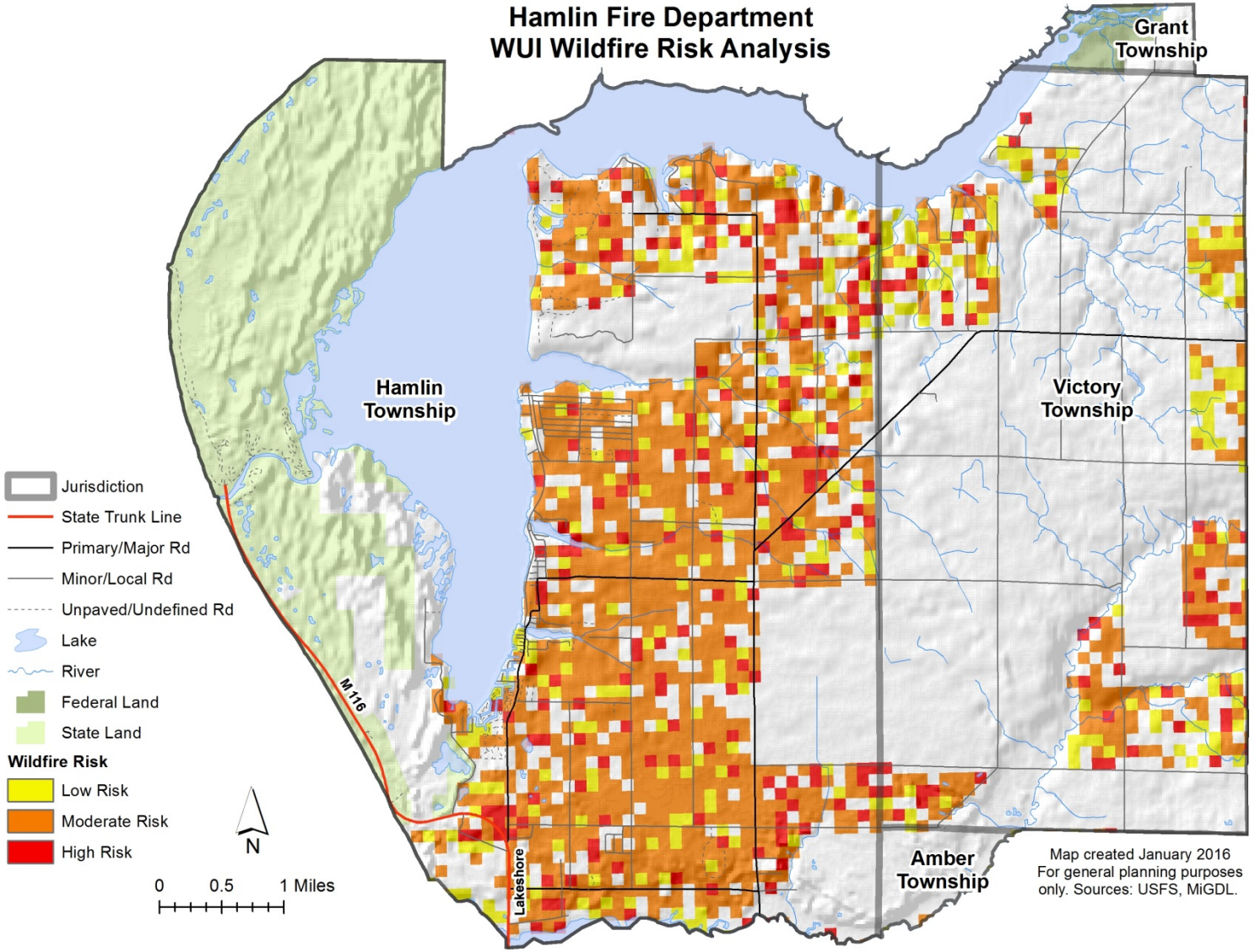
General Description:
The Hamlin Township Fire Department serves Hamlin Township, part of Victory Township, and a small part of Amber Township. The area is characterized by many residential and seasonal neighborhoods sandwiched between forests and Hamlin Lake, as well as the Ludington State Park. As a result, a large proportion of the area is within wildland-urban interface and intermix areas. There are also numerous locations where only one escape route exists (areas where there is only one way in or out). Lastly, there is a concentration of oil/gas wells near the border of Hamlin and Victory townships that are known to have detectable levels of hydrogen sulfide.




Hamlin Fire Department
District Base Map
Grant Township
Hamlin Township
Victory Township
Amber Township
Hamlin Lake
Big Sable River
Lincoln River
Dennis Creek
Middle Bayou
South Bayou
M 116
Colburn Rd
Beyer Rd
Ehler Rd
Fountain Rd
Lincoln Rd
Beaune Rd
Meyers Rd
Victory Park
Dennis Rd
Stiles Rd
Jebavy Dr
Victory Dr
Angling Rd
Mavis Rd
Dewey Rd
Anderson Rd
Piney Ridge Rd
Sugar Grove Rd
Peterson Rd
Victory Corner Rd
Groth Rd
Lakeshore Dr
Rath Rd
Sherman Rd
Fisher Rd
Decker Rd
Jagger Rd
Jurisdiction
State Trunk Line
Primary/Major Rd
Minor/Local Rd
Unpaved/Undefined Rd
Communication Tower
H2S Well*
Fire Station
Water Supply
School
Dam
Lake
River
Power Line
Pipeline
Federal Land
State Land
Municipal Land
N
0 0.55 1.1 Miles
Map created May 2016
Source: USGS National Map, MI DEQ Environmental Mapper, USFS, MI DNR, ESRI
*Oil or gas well know to have detectable levels of hydrogen sulfide

Hamlin Fire Department
Aerial Imagery and Relief




Hamlin Fire Department
WUI Wildfire Risk Analysis
Grant Township
Hamlin Township
Victory Township
Amber Township
Lakeshore
M116
Jurisdiction
State Trunk Line
Primary/Major Rd
Minor/Local Rd
Unpaved/Undefined Rd
Lake
River
Federal Land
State Land
Wildfire Risk
Low Risk
Moderate Risk
High Risk
N
0 0.5 1 Miles
Map created January 2016
For general planning purposes
only. Sources: USFS, MiGDL.

H. Ludington Fire Department

Chief: Jerry Funk
Number of paid on-call firefighters: 20
Inventory of major equipment:

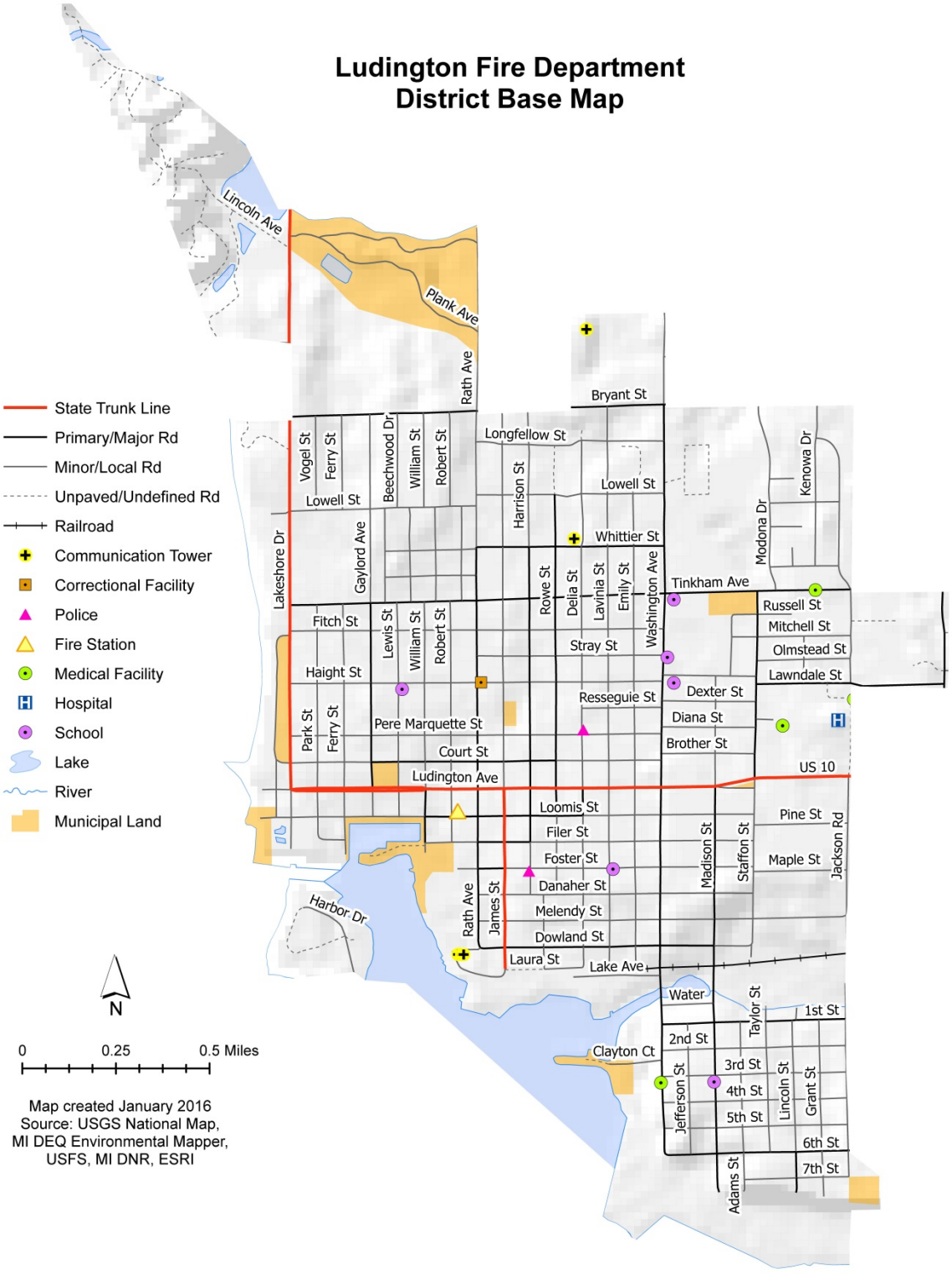
#	Type
20-11	Pumper, 1,000 Gal, 1,250 GPM
20-12	Pumper, 1,000 Gal, 1,250 GPM
20-13	Pumper, 750 Gal, 1,250 GPM
20-51	Ladder Truck, 2,000 GPM
20-42	General Rescue Vehicle
20-41	Medical First Response Vehicle, Tahoe
20-61	Off Road Vehicle, Polaris
	Water Rescue Boat, 26', 3,000 GPM

Mutual Aid Agreements:
- Oceana County Fire Departments (March 2001)
- MDNR Forest, Mineral and Fire Management (August, 2007)

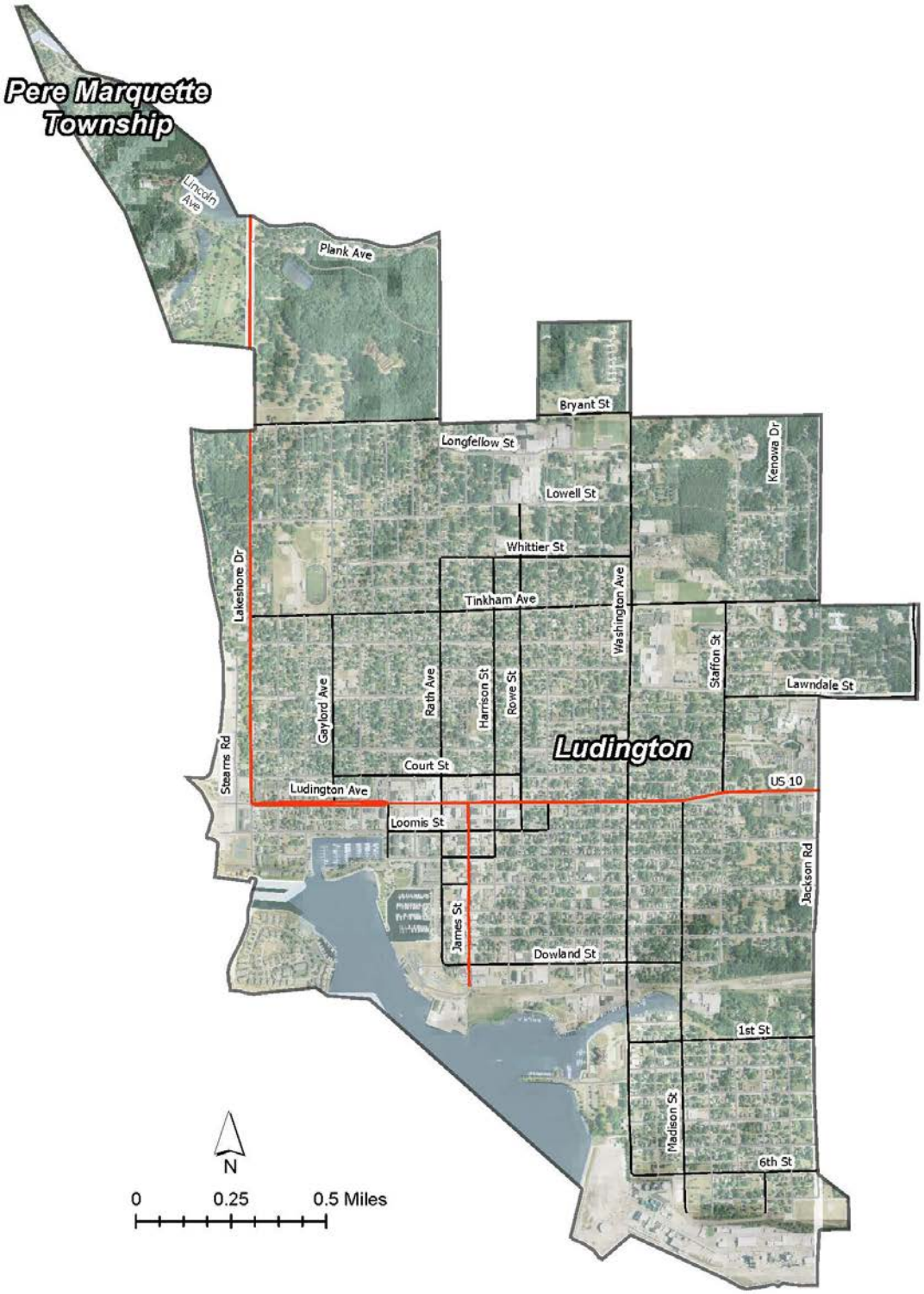
Response Capabilities and Services:
- Fire
- Medical first response
- Jaws

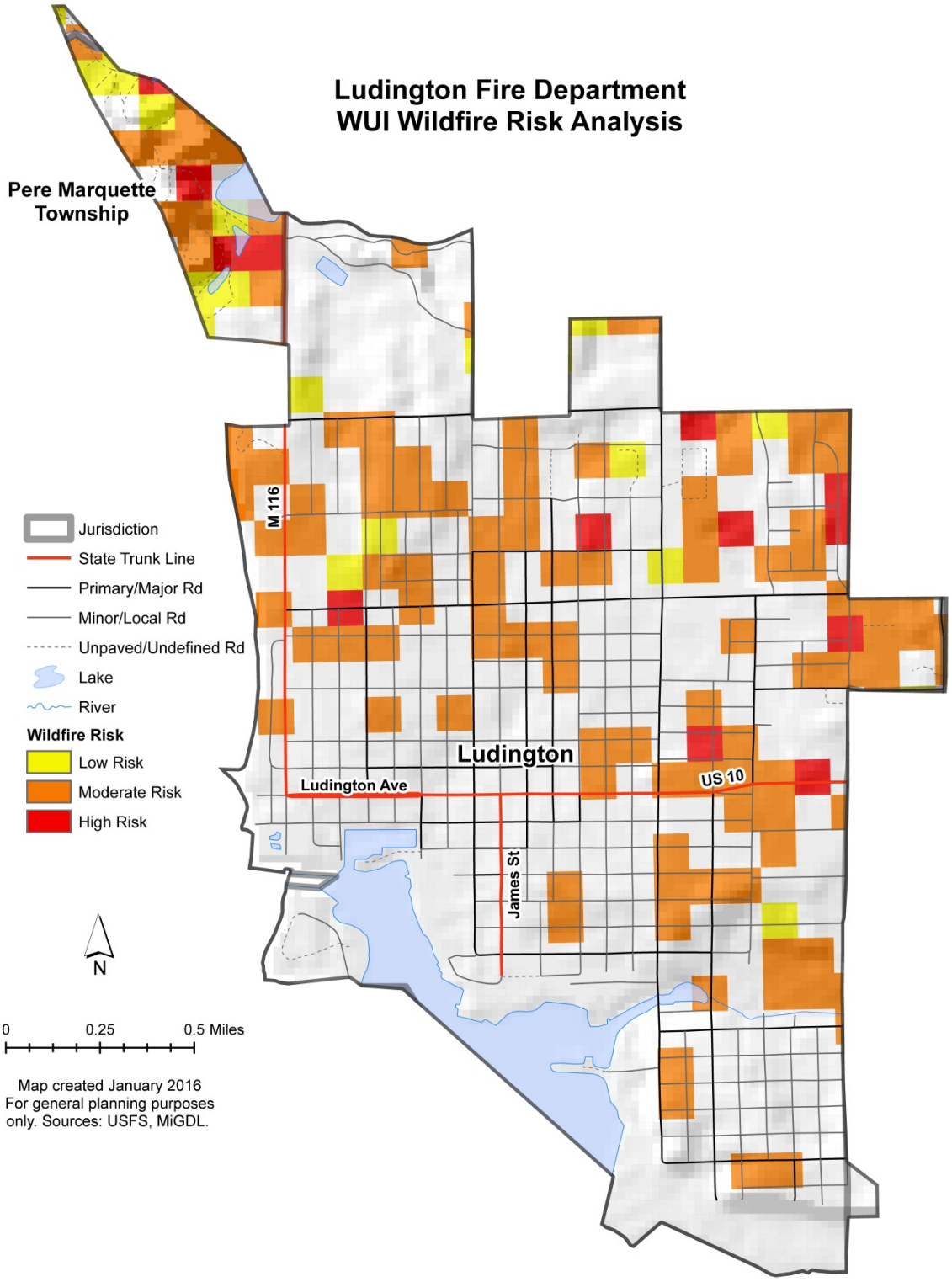
Community Outreach and Education:
Pamphlet distribution at public meetings.

General Description:
The Ludington Fire Department provides fire protection to the City of Ludington. This area is mainly developed with a fair amount of trees within the urban setting. More densely forested areas of the city are found in the northern third, as well as adjacent to those areas in Pere Marquette Township. Because of the presence of development as well as an apparent availability of vegetative fuels, many area of the city are considered to be within wildland-urban interface areas.


Ludington Fire Department
District Base Map
State Trunk Line
Primary/Major Rd
Minor/Local Rd
Unpaved/Undefined Rd
Railroad
Communication Tower
Correctional Facility
Police
Fire Station
Medical Facility
Hospital
School
Lake
River
Municipal Land
N
0
0.25
0.5 Miles
Map created January 2016
Source: USGS National Map,
MI DEQ Environmental Mapper,
USFS, MI DNR, ESRI
Lincoln Ave
Plank Ave
Rath Ave
Bryant St
Longfellow St
Lowell St
Whittier St
Tinkham Ave
Russell St
Mitchell St
Olmstead St
Lawndale St
Dexter St
Diana St
Brother St
US 10
Pine St
Maple St
Jackson Rd
Vogel St
Ferry St
Beechwood Dr
William St
Robert St
Harrison St
Kenowa Dr
Modona Dr
Lakeshore Dr
Gaylord Ave
Rowe St
Delia St
Lavinia St
Emily St
Washington Ave
Fitch St
Lewis St
Haight St
Stray St
Resseguie St
Park St
Pere Marquette St
Court St
Ludington Ave
Loomis St
Filer St
Foster St
Danaher St
Melendy St
Dowland St
Laura St
Lake Ave
Harbor Dr
James St
Madison St
Stiffon St
Water
Taylor St
1st St
2nd St
3rd St
4th St
5th St
6th St
7th St
Clayton Ct
Jefferson St
Lincoln St
Grant St
Adams St

Ludington Fire Department
Aerial Imagery and Relief




Ludington Fire Department
WUI Wildfire Risk Analysis
Pere Marquette Township
M 116
Ludington
Ludington Ave
US 10
James St
Jurisdiction
State Trunk Line
Primary/Major Rd
Minor/Local Rd
Unpaved/Undefined Rd
Lake
River
Wildfire Risk
Low Risk
Moderate Risk
High Risk
N
0
0.25
0.5 Miles
Map created January 2016
For general planning purposes
only. Sources: USFS, MiGDL.

I. Pere Marquette Fire Department

Chief: Lawrence Gaylord
Number of part-paid firefighters: 20
Number of volunteer firefighters: 0
Inventory of major equipment:

#	Year	Type
29-41	2005	Chevy Suburban 4wd Medical First Responder
29-11	1999	E-One Class A Pumper 1000 gal tank
29-12	2008	GMC 500 gal mini-pumper
29-21	1996	Marion Class A Pumper/Tanker 1500 gal tank
29-51	1999	E-One Class A Pumper/ 75 ft Ladder 500 gal tank

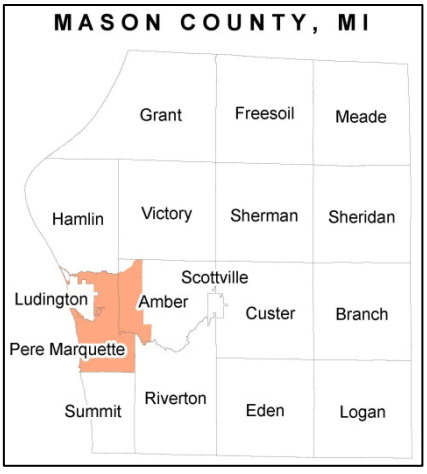
Mutual Aid Agreements:

- Mason County Fire Departments
- Informal agreements with Lake, Manistee, and Oceana counties

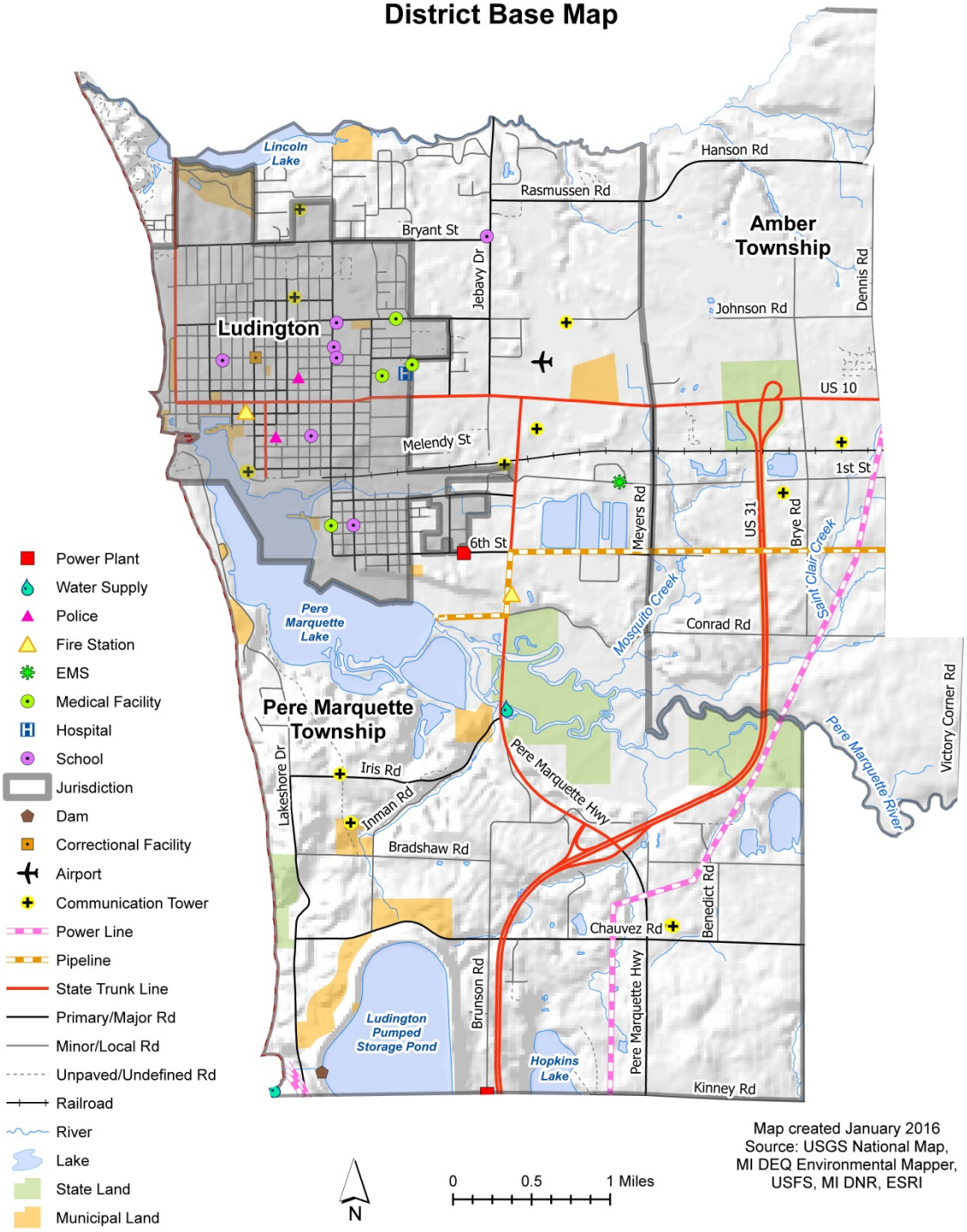
Response Capabilities and Services:
- Fire Suppression
- Medical first response
- Search and rescue

Community Outreach and Education:
- Fire extinguisher training
- Grade school visits during fire prevention month

General Description:
The Pere Marquette Township Fire Department provides fire protection to Pere Marquette Township and the western portion of Amber Township. Areas near Ludington and the US31/US10 corridor are urbanized. Some areas adjacent to development is forested or natural vegetation. As a result, much of the area is considered Wildland-urban interface. A number of public parks and residential developments are located between US31/Pere Marquette Highway and the Lake Michigan shoreline.

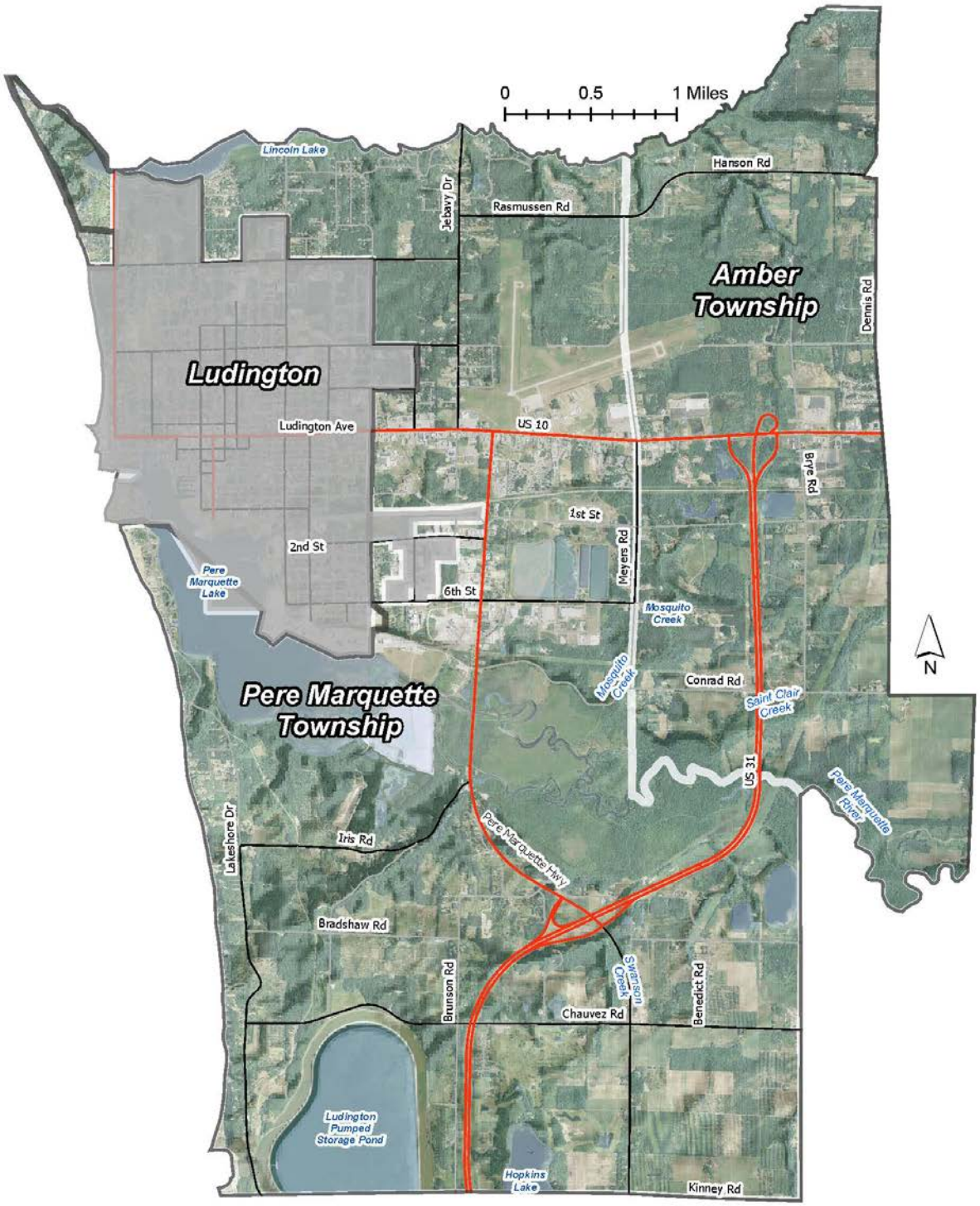


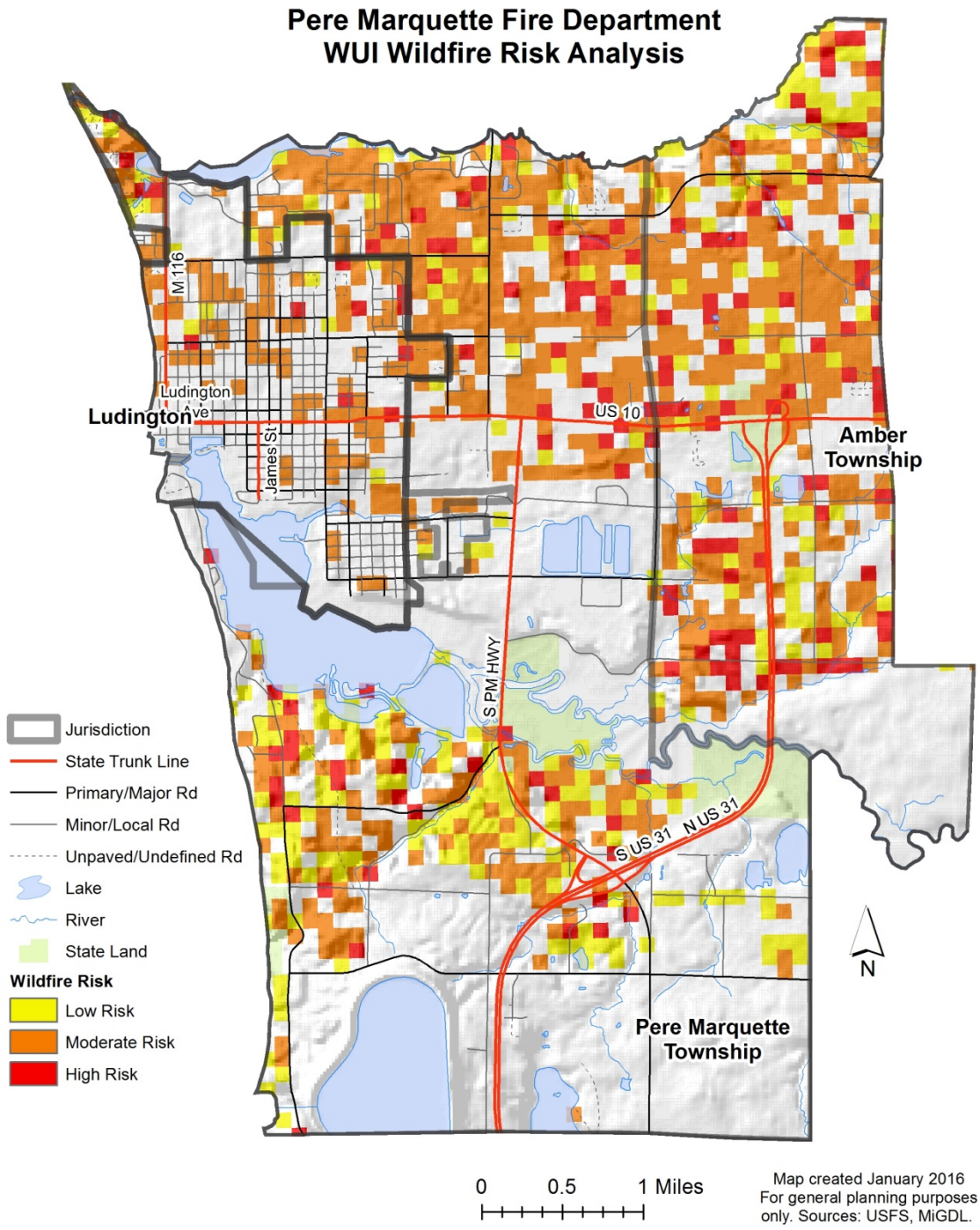
Pere Marquette Fire Department
District Base Map



Map created January 2016
Source: USGS National Map,
MI DEQ Environmental Mapper,
USFS, MI DNR, ESRI

Pere Marquette Fire Department
Aerial Imagery and Relief



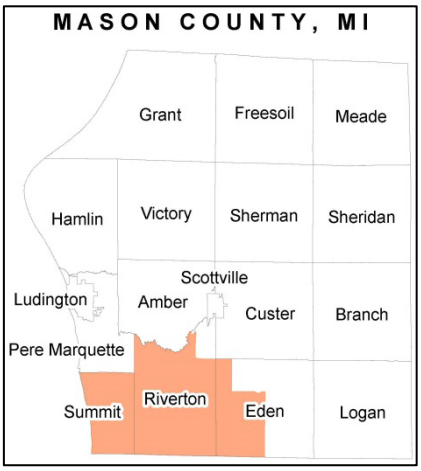

Pere Marquette Fire Department
WUI Wildfire Risk Analysis
M 116
Ludington
Ludington Ave
James St
US 10
Amber Township
S PM HWY
S US 31
N US 31
Pere Marquette Township
N
Jurisdiction
State Trunk Line
Primary/Major Rd
Minor/Local Rd
Unpaved/Undefined Rd
Lake
River
State Land
Wildfire Risk
Low Risk
Moderate Risk
High Risk
0
0.5
1 Miles
Map created January 2016
For general planning purposes
only. Sources: USFS, MiGDL.

J. Riverton Fire Department

Chief: Joe Cooper
Number of part-paid firefighters: 25
Number of volunteer firefighters: 0
Inventory of major equipment:

Year	Type	Condition
1998	Freightliner, Class A Pumper	Good
2001	Freightliner, 2000 Gal Tender Truck	Good
2008	Ford F550, 4x4 Rescue Truck	Excellent
2016	Ford F550, Brush Truck	Excellent
2008	Polaris Ranger, 6x6 ATV, 75 Gal water tank skid unit	Good
	14' Jon Boat, 6 HP	

Mutual Aid Agreements:
- All Mason County fire units
- Pentwater FD (Oceana Co.)
- Crystal Valley FD (Oceana Co.)
- Manistee FD (Manistee Co.)
- Lake FD (Lake Co.)

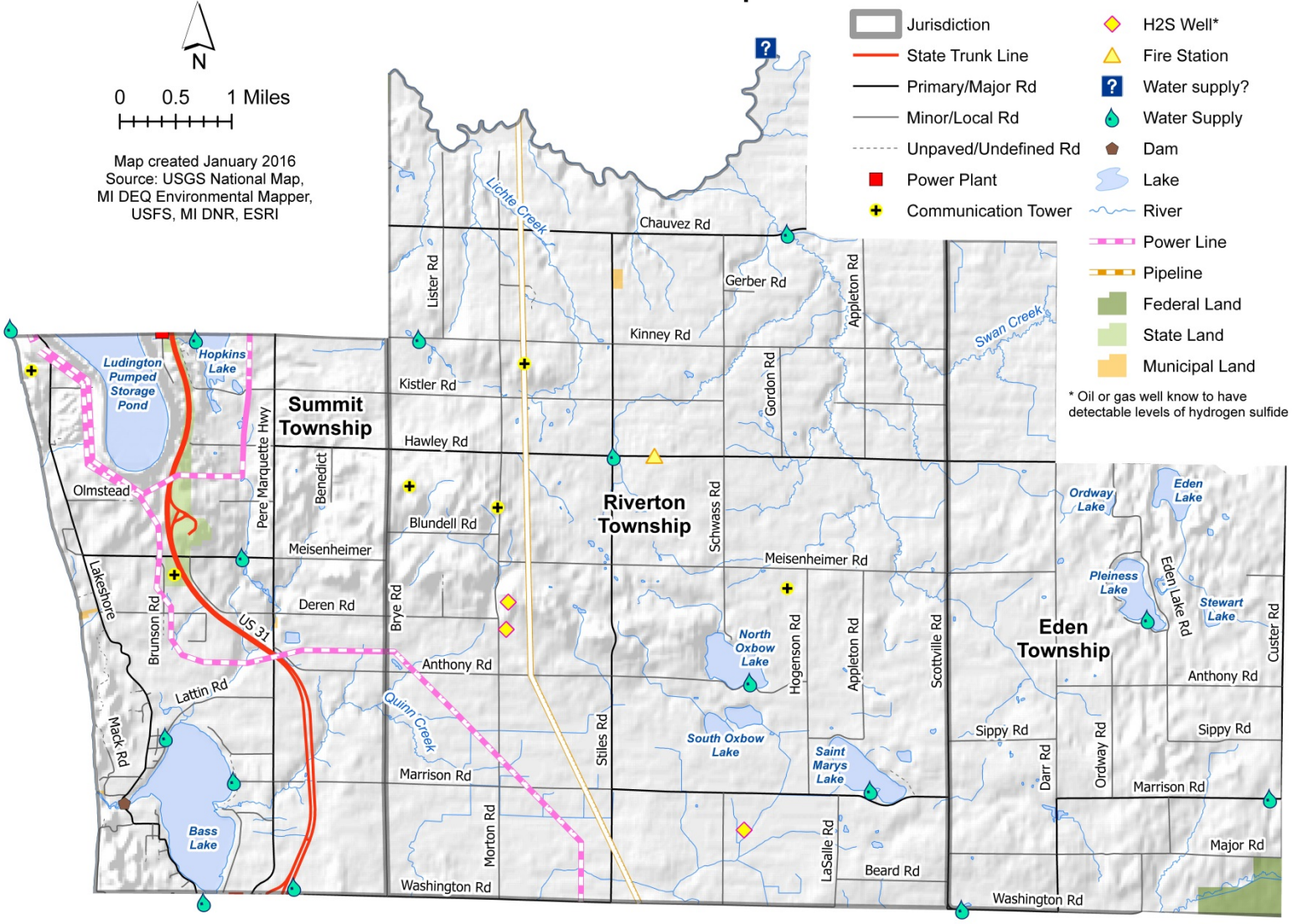


Response Capabilities and Services:
"We provide fire and medical coverage. We have access to heavy equipment in the area and have a small rescue boat for our small lakes. We currently have 25 firefighters and most are first responders as well."

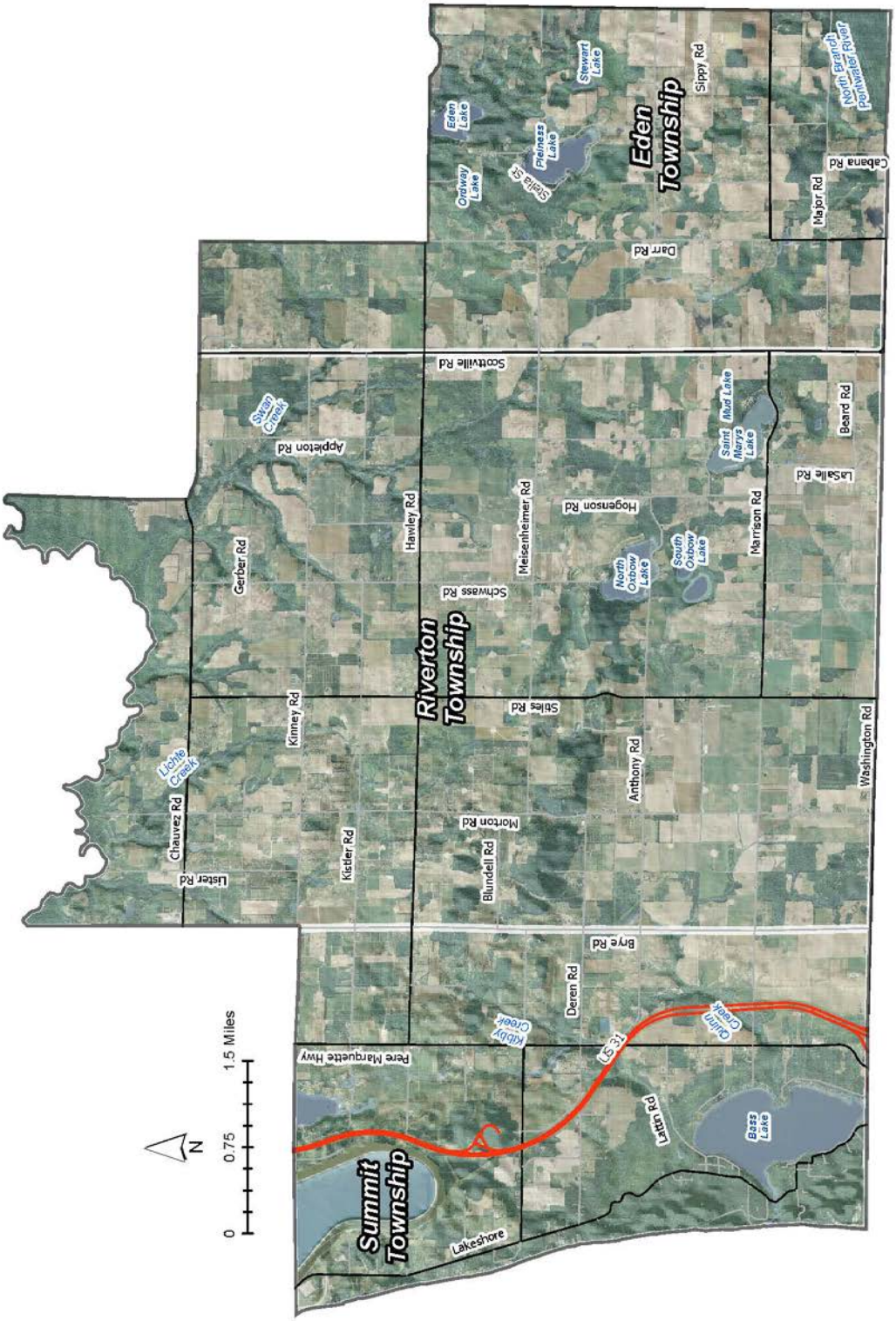
General Description:
The Riverton Fire Department covers the townships of Riverton, Summit, and a portion of Eden. Much of land in this area is used as farmland. Residential developments are common around inland lakes and between US31 and the Lake Michigan shoreline. Water sources for fire suppression are available at 15 sites distributed across the service area. Sources include five dry hydrants and ten pond or lake fill sites.

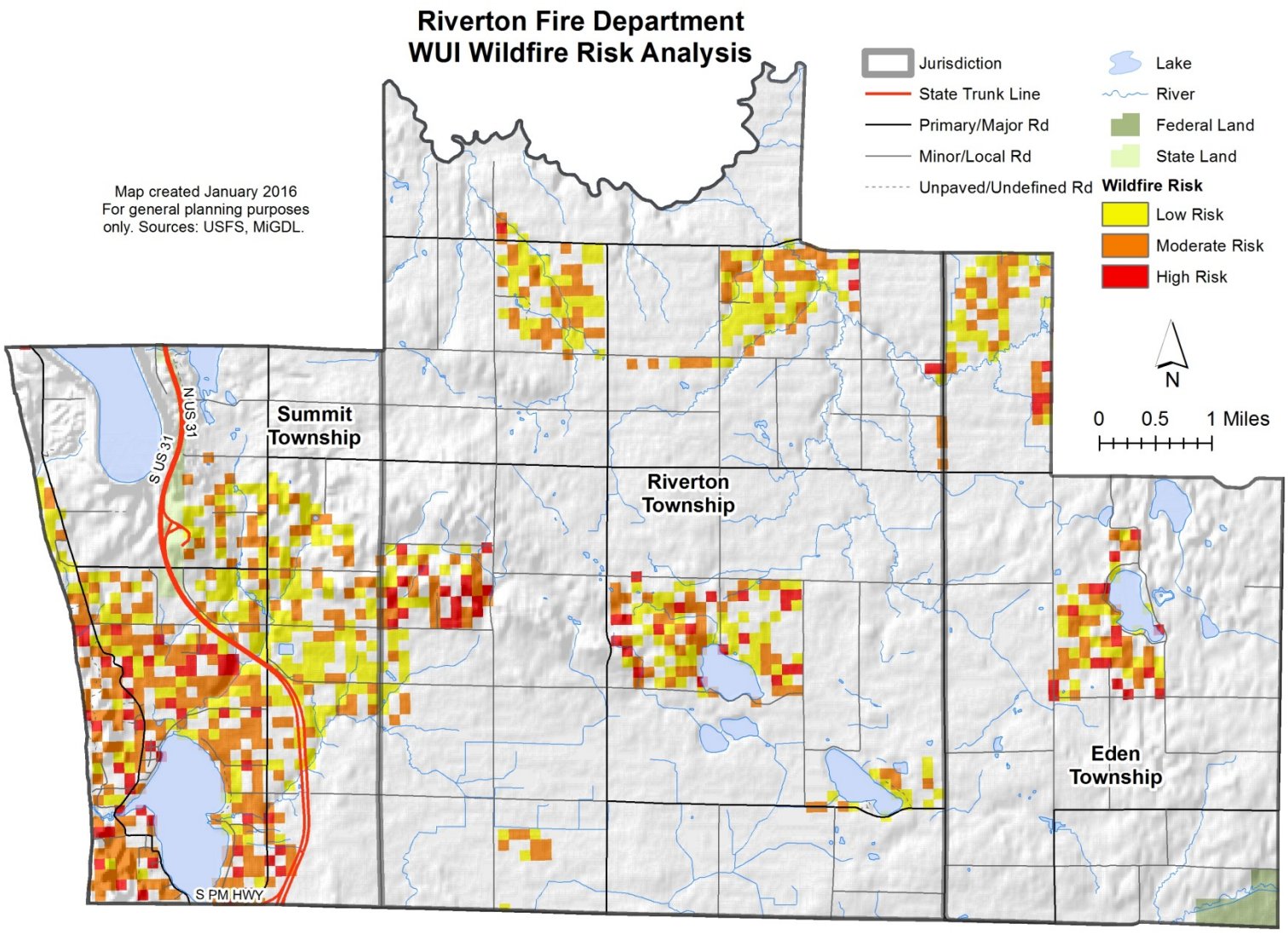
Wildfire Vulnerabilities:
- Infrastructure vulnerable to wildfire can be found along Pere Marquette River, North Oxbow Lake, Saint Mary's Lake, Pleiness Lake, Bass Lake, and the Lake Michigan shoreline.
- Summit Park needs better access to the beach for the 6x6 ATV. This is the only place to access the Lake Michigan shoreline from the Consumers Energy Pumped Storage Plant to the southern county line.
- Specific locations with limited access include the north shore of Saint Mary's Lake, Birchwood Hills subdivision on Lake Michigan shoreline, and Montgomery Lane on Lake Michigan shoreline.
- All areas along the Lake Michigan shoreline need improvement to driveways. Trees need to be trimmed or removed to allow access for fire trucks.
- Many homes in dune areas have no fire protection because of elevation.

Riverton Fire Department
District Base Map



Riverton Fire Department
Aerial Imagery and Relief




Riverton Fire Department
WUI Wildfire Risk Analysis
Map created January 2016
For general planning purposes
only. Sources: USFS, MiGDL.
Jurisdiction
State Trunk Line
Primary/Major Rd
Minor/Local Rd
Unpaved/Undefined Rd
Lake
River
Federal Land
State Land
Wildfire Risk
Low Risk
Moderate Risk
High Risk
N
0 0.5 1 Miles
N US 31
S US 31
Summit Township
Riverton Township
Eden Township
S PM HWY

K. Scottville Fire Department

Chief: Dale Larr
Number of part-paid firefighters: 18
Number of volunteer firefighters: 0
Inventory of major equipment:

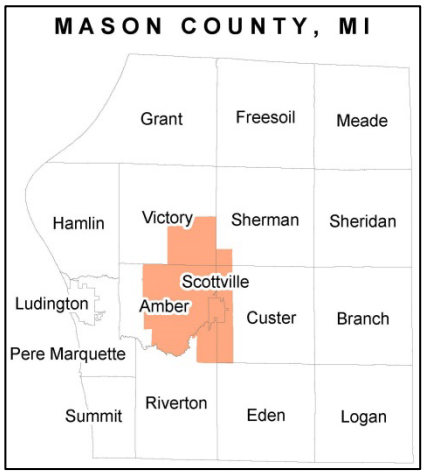
#	Year	Type	Condition
2121	2008	Pumper/Tanker, 1,250 gpm, 1,845 gal	Very Good
2111	1998	Class A Pumper, 1,250 gpm, 1,000 gal	Good
2131	2002	Brush Truck, 250 gpm, 350 gal	Fair
2141	2009	Medical/Rescue Truck	Very Good

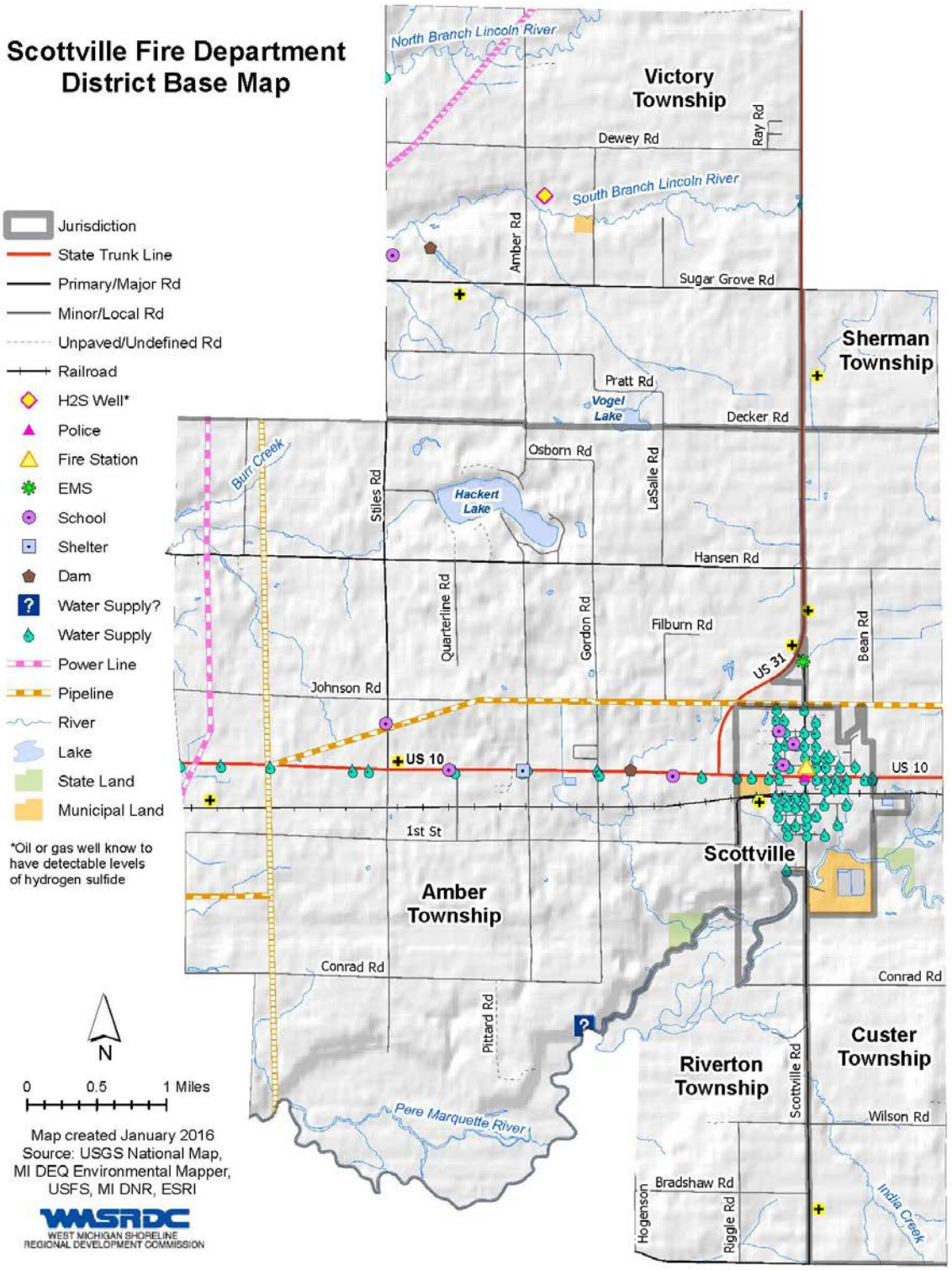
Mutual Aid Agreements:
- All Mason County fire units

Response Capabilities and Services:
- Fire
- Medical first response

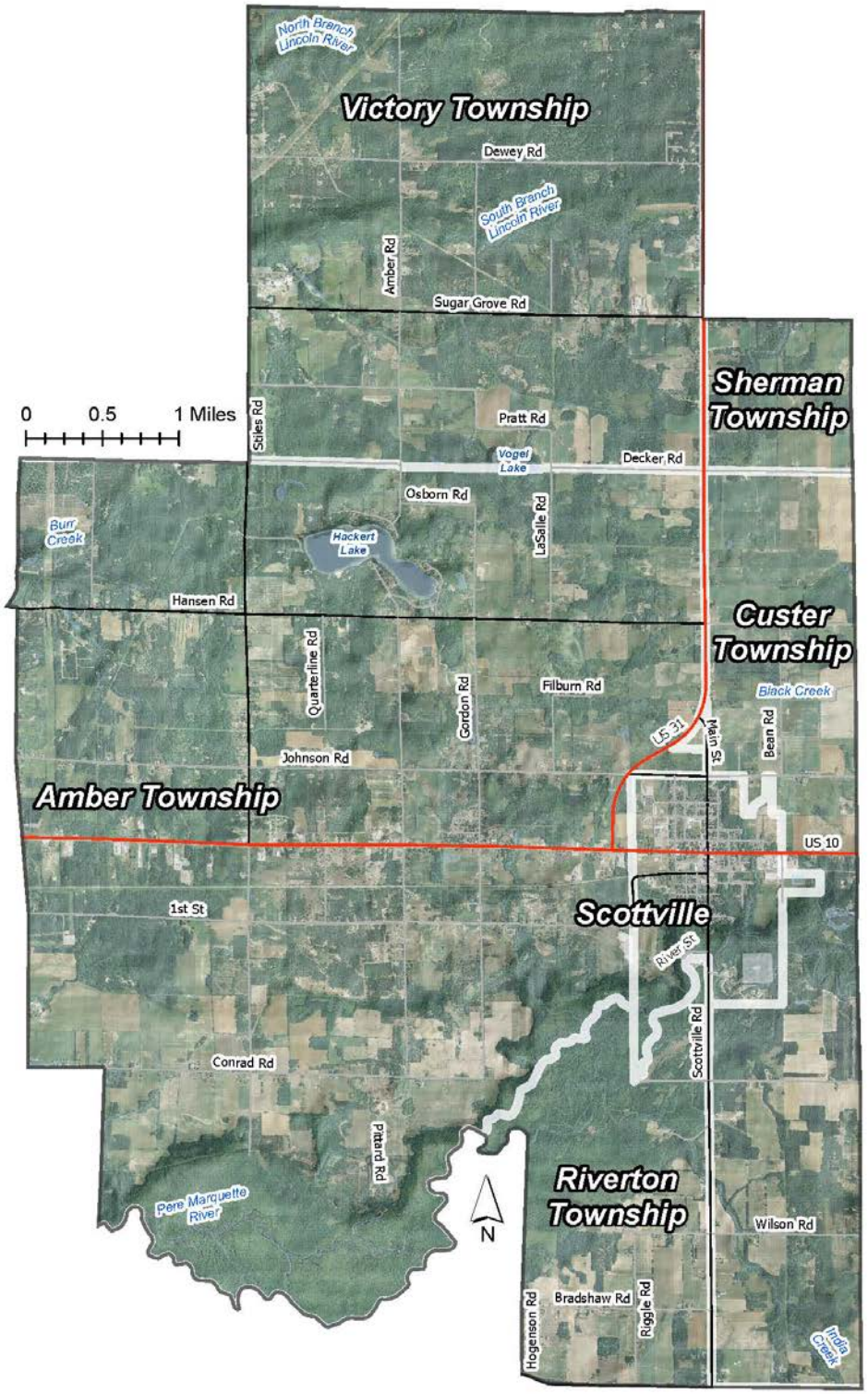
Community Outreach and Education:
Pamphlet distribution at schools, churches, senior center, library.

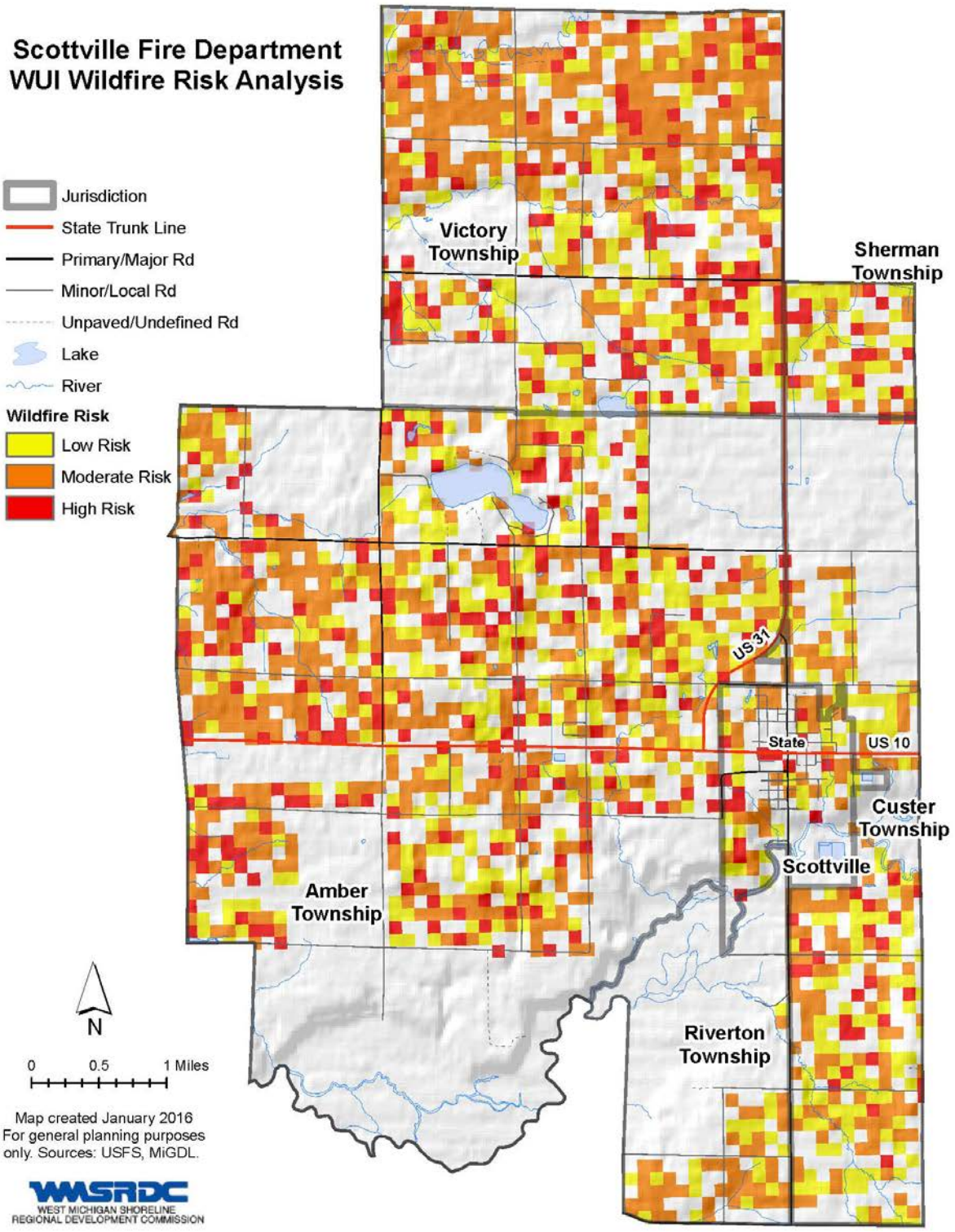
General Description:
The Scottville Fire Department covers the City of Scottville, most of Amber Township, and portions of Custer, Sherman, and Victory townships. The landscape features a mix of urbanized development, scattered rural residences, farmland, and natural vegetation. Due to this mix, much of the area is considered to be Wildland-urban interface. Water sources for fire suppression are abundant in the City of Scottville and along the US/10 corridor.




Scottville Fire Department
District Base Map
Jurisdiction
State Trunk Line
Primary/Major Rd
Minor/Local Rd
Unpaved/Undefined Rd
Railroad
H2S Well*
Police
Fire Station
EMS
School
Shelter
Dam
Water Supply?
Water Supply
Power Line
Pipeline
River
Lake
State Land
Municipal Land
*Oil or gas well know to have detectable levels of hydrogen sulfide
N
0 0.5 1 Miles
Map created January 2016
Source: USGS National Map, MI DEQ Environmental Mapper, USFS, MI DNR, ESRI
WMSRDC
WEST MICHIGAN SHORELINE REGIONAL DEVELOPMENT COMMISSION
North Branch Lincoln River
Victory Township
Dewey Rd
Ray Rd
South Branch Lincoln River
Amber Rd
Sugar Grove Rd
Sherman Township
Pratt Rd
Vogel Lake
Decker Rd
Burr Creek
Stiles Rd
Osborn Rd
LaSalle Rd
Hackert Lake
Hansen Rd
Quarterline Rd
Gordon Rd
Filburn Rd
US 31
Bean Rd
Johnson Rd
US 10
1st St
Scottville
Amber Township
Conrad Rd
Pittard Rd
Riverton Township
Custer Township
Scottville Rd
Wilson Rd
Pere Marquette River
Bradshaw Rd
Hogenson
Riggle Rd
India Creek

Scottville Fire Department
Aerial Imagery and Relief




Scottville Fire Department
WUI Wildfire Risk Analysis
Jurisdiction
State Trunk Line
Primary/Major Rd
Minor/Local Rd
Unpaved/Undefined Rd
Lake
River
Wildfire Risk
Low Risk
Moderate Risk
High Risk
Victory Township
Sherman Township
US 31
State
US 10
Custer Township
Scottville
Amber Township
Riverton Township
N
0
0.5
1 Miles
Map created January 2016
For general planning purposes only. Sources: USFS, MiGDL.
WMSRDC
WEST MICHIGAN SHORELINE REGIONAL DEVELOPMENT COMMISSION

Appendix B

USFS & MDNR FIRE PROTECTION RESOURCES

UNITED STATES FOREST SERVICE

Huron-Manistee National Forest – West Zone

Summary of Fire Program Resources

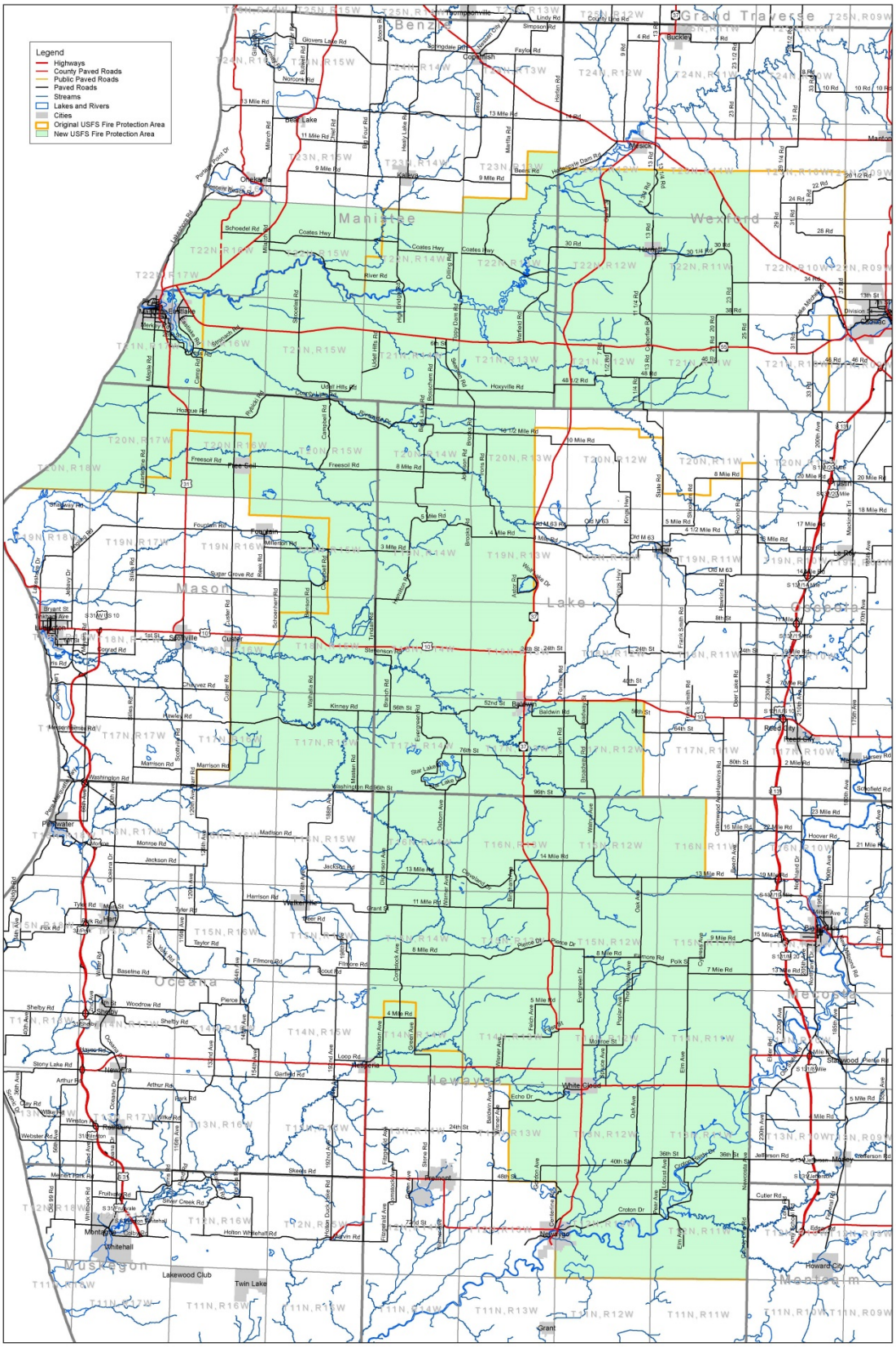
at Manistee

1 Battalion Chief
1 type 6 engine with Captain and crew
1 dozer with operator and assistant

at Baldwin

1 Division Chief
1 Battalion Chief
2 type 6 engines with Captains and crew
2 dozers with operators and assistant

Fire Protection Boundaries



MICHIGAN DEPARTMENT OF NATURAL RESOURCES

Cadillac Management Unit

The Michigan DNR (DNR) Cadillac Management Unit includes fire response stations at Baldwin, Evart, and Manton. These stations are responsible for Initial Attack (IA) wildland fire suppression in the counties of Lake, Mason, Mecosta, Missaukee, Osceola, and Wexford. Also, Oceana Field Office can also respond as needed by the Forest Fire Supervisor. Each station is staffed with a Forest Fire Officer, and additional staff, as needed, to meet fire danger conditions. The management unit is supervised by the Unit Manager for day to day operations and a Forest Fire Supervisor for fire suppression and prevention activities. Fire suppression resources in these stations may be dispatched to other areas as needed, and similarly may be assisted by resources from other areas as needed, including other management units. In addition, these resources may assist or be assisted by the US Forest Service (USFS).

Exact Initial Attack response boundaries within the Cadillac Management Unit have been established by mutual aid agreement between the USFS and DNR, which are illustrated on page B3.

BALDWIN FIELD OFFICE Voice:(231)745-4651x6950 Fax:(231)745-8743

Staff Name	Call Sign/800 ID	Office Phone
Dave Fisher UNIT MANAGER	CS: Baldwin 40	(231) 745-4651 x6946
Bruce Tower FIRE OFFICER SUP	CS: Baldwin 50	(231) 745-4651 x6950
Gary Meese FIRE OFFICER	CS: Baldwin 51	(231) 745-4651 x6952
Michael Adamcyzk FOREST TECH	CS: Baldwin 41	(231) 745-4651 x6941

Equipment Type	Description	Call Sign/800 ID	Stand by Location
ENGINE, ATV	Polaris 6 wheeler w/tank		
PUMPS, PORTABLE	Mark III Portable Pump		
PUMPS, PORTABLE	Honda portable pump		
OTHER	Foam		
OTHER	Honda 400 4x4		
OTHER	Polaris Sportsman 400 4x4 ATV		
CREW TRANSPORTATION	1/2 Ton Dodge 4x4 Pickup	No Radio	
CREW TRANSPORTATION	1/2 ton pickup 4x4 w/ topper	No Radio	
TILTBED, TANDEM AXLE	Peterbilt tandem tiltbed	CS: Baldwin 52	
SKIDGINE	John Deere skidgine	CS: Baldwin 58	
CREW TRANSPORTATION	Dodge Pickup 4 dr 4x4	CS: BD-50	
CREW TRANSPORTATION	1 ton 4x4 pickup 8 foot box	CS: BD-51	
TRACTOR-PLOW, TYPE III	JD-350D	CS: BD-53B	
TRUCK-TRACTOR, TANDEM AXLE	Peterbilt	CS: BD-54	
ENGINE, SMALL	Hummer	CS: BD-55	
ENGINE, LARGE	Navistar, no plow	CS: BD-57	

EVART FIELD OFFICE Voice:(231)734-5840 Fax:(231)734-6491

Staff Name	Call Sign/800 ID	Office Phone
Curt Wemple FIRE OFFICER	CS: Evart 51	(231)734-5840

Equipment Type	Description	Call Sign/800 ID	Stand by Location
PUMPS, PORTABLE	Wicke Pump		
PUMPS, PORTABLE	Homelite porta Pump		
PUMPS, PORTABLE	Jaguar Portable pump		
OTHER	Sprinkler Kit w/ Box		
OTHER	Suppression foam		
CREW TRANSPORTATION	Dodge 1/2 t 4 dr 4x4 Pickup	CS: EV-51	
TRACTOR-PLOW, TYPE III	JD-550E LPG	CS: EV-53	
TRUCK-TRACTOR, TANDEM AXLE	Peterbilt	CS: EV-54	
ENGINE, LARGE	AM-Gen 6x6	CS: EV-57	
ENGINE, LARGE	2006 Navistar 4x4 Foam Plow	CS: EV57B	MCBAIN
ENGINE, SMALL	Chevy 1 ton 4x4	CS: Evart 55	

MANTON FIELD OFFICE Voice:(231)824-3591x12 Fax:(231)824-9340

Staff Name	Call Sign/800 ID	Office Phone
Bret Baker FIRE OFFICER	CS: Manton 51	(231)824-3591x12
James Malloy FORESTER		
Joe Ventimiglia FORESTER		
Steve Eisele FOREST TECHNICIAN		

Equipment Type	Description	Call Sign/800 ID	Stand by Location
PUMPS, PORTABLE	portable pump		
OTHER	Honda 4x4 ATV		
OTHER	Class A foam per gallon		
CREW TRANSPORTATION	2010 Ford F150 4x4 crew cab	No radio	
CREW TRANSPORTATION	1/2 ton 4x4 pickup shortbed	No Radio	
CREW TRANSPORTATION	1/2 ton 4x4 pickup shortbed	No Radio	
DOZER, TYPE 3	450H Tractor plow	CS: Manton 53	
TRUCK-TRACTOR,TANDEM AXLE	Freightliner semi tractor	CS: Manton 54	
CREW TRANSPORTATION	Ford F 350 4x4 reg. cab p.u.	CS: MN 51	
ENGINE, SMALL	Chev C-30 4x4	CS: MN-55	
ENGINE, LARGE	AM General 6x6, 5 Ton	CS: MN-57	
ENGINE, LARGE	Navistar 4x4 with plow	CS: MN-57B	Fife Lake

OCEANA FIELD OFFICE Voice:(231)861-5636 Fax:(231)861-2682
(MDNR Plainwell Management Unit)

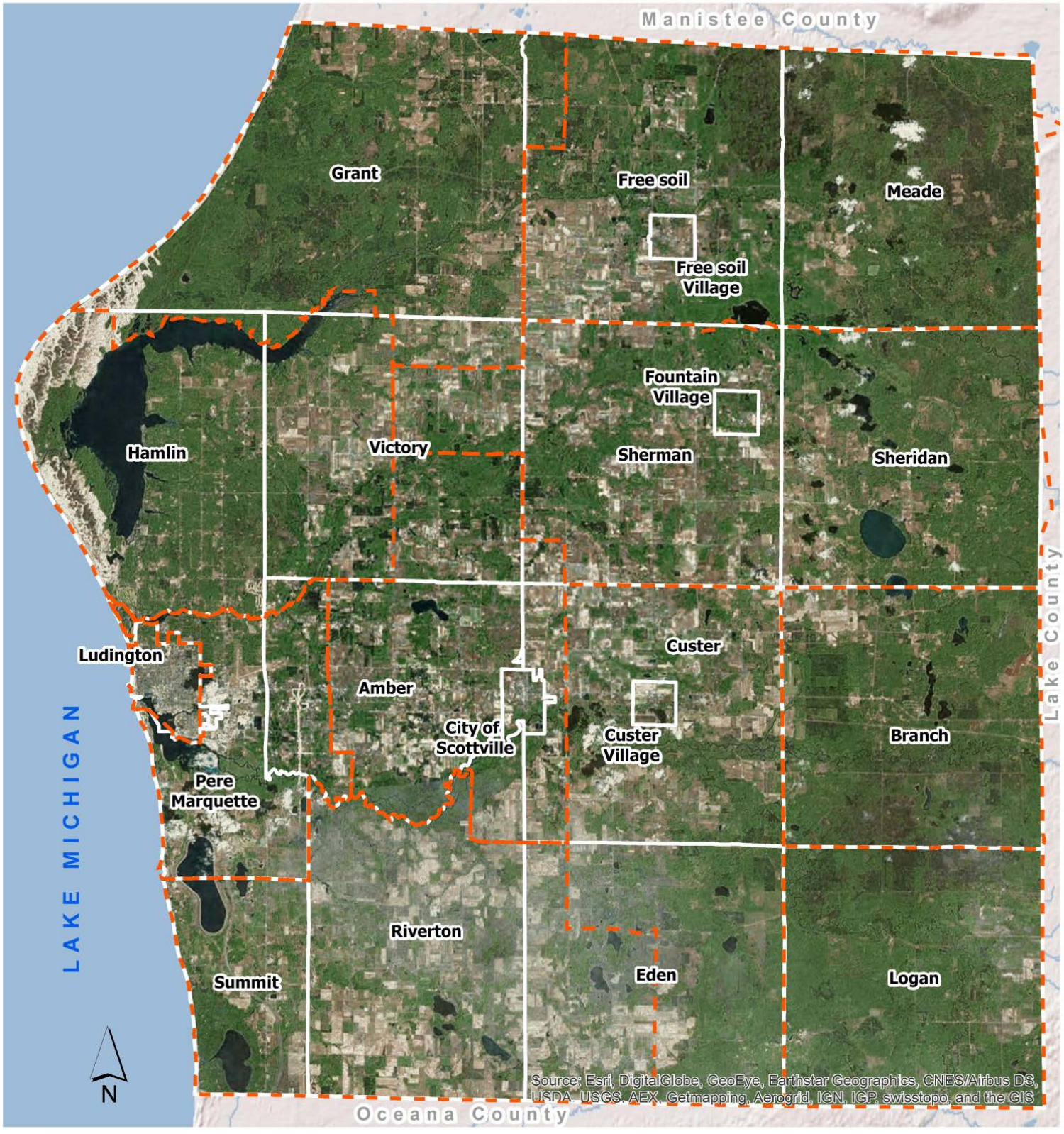
Staff Name	Call Sign/800 ID	Office Phone
Ray Cole FIRE OFFICER	CS: Oceana 51	(231)861-5636x10

Equipment Type	Description	Call Sign/800 ID	Stand by Location
PUMPS, PORTABLE	Wick 250 pump		
OTHER	Foam		
CREW TRANSPORTATION	Ford F2504x4 Pickup extended cab	CS: OC51	
TRACTOR-PLOW, TYPE III	JD-350D Relife	CS: OC53	
TRUCK-TRACTOR, SINGLE AXLE	International WorkStar Semi-Tractor AWD single axle	CS: OC54	
ENGINE, SMALL	Hummer 4x4	CS: OC55	
ENGINE, LARGE	Am-Gen 6x6	CS: OC57	

Appendix C

MAPS

Mason County
County Aerial Image



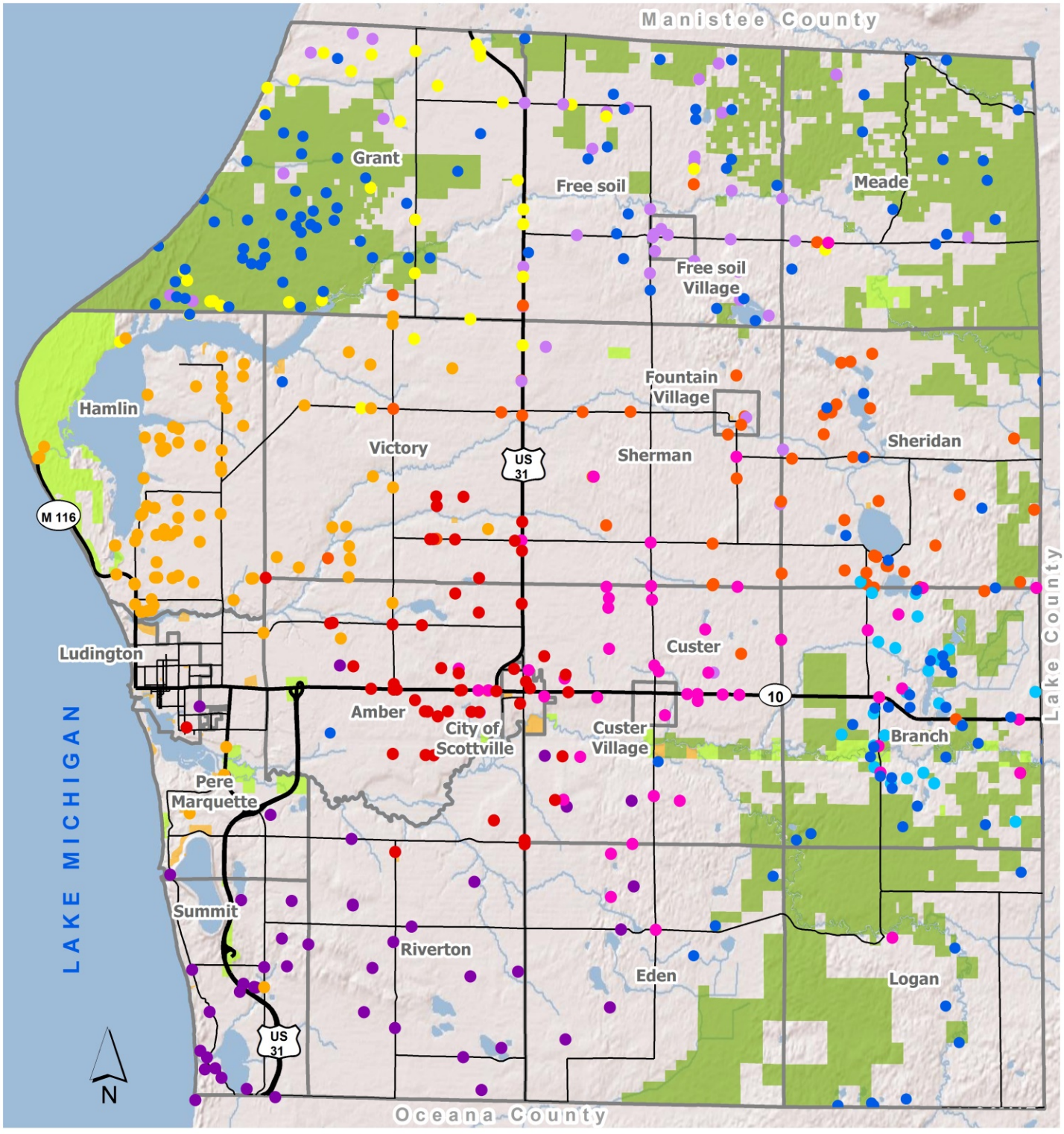
0 2 4 Miles

Fire District

WMSRDC
WEST MICHIGAN SHORELINE REGIONAL DEVELOPMENT COMMISSION

Map created April 2016
Source: USGS National Map, MIGDL, ESRI and Michigan DNR

Mason County
Reported Wildfires



Fires by Department (1999-2015)

- Custer
- Grant
- Scottville
- Branch
- Fountain
- Free Soil Meade
- Hamlin
- Riverton

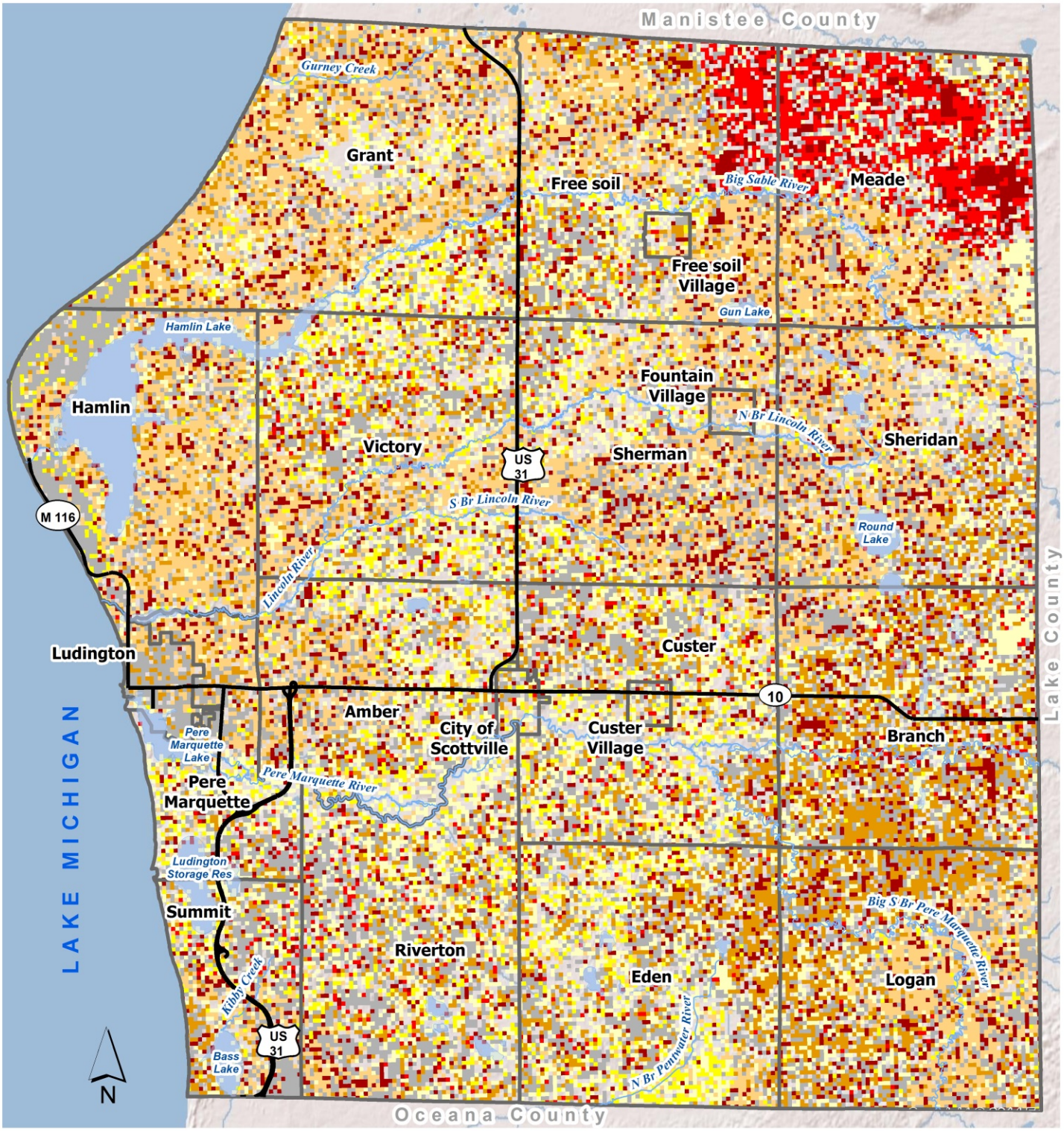
- DNR Reported Fires (1978-2011)
- Federal Land
- State Land
- Municipal Land

0 2 4 Miles

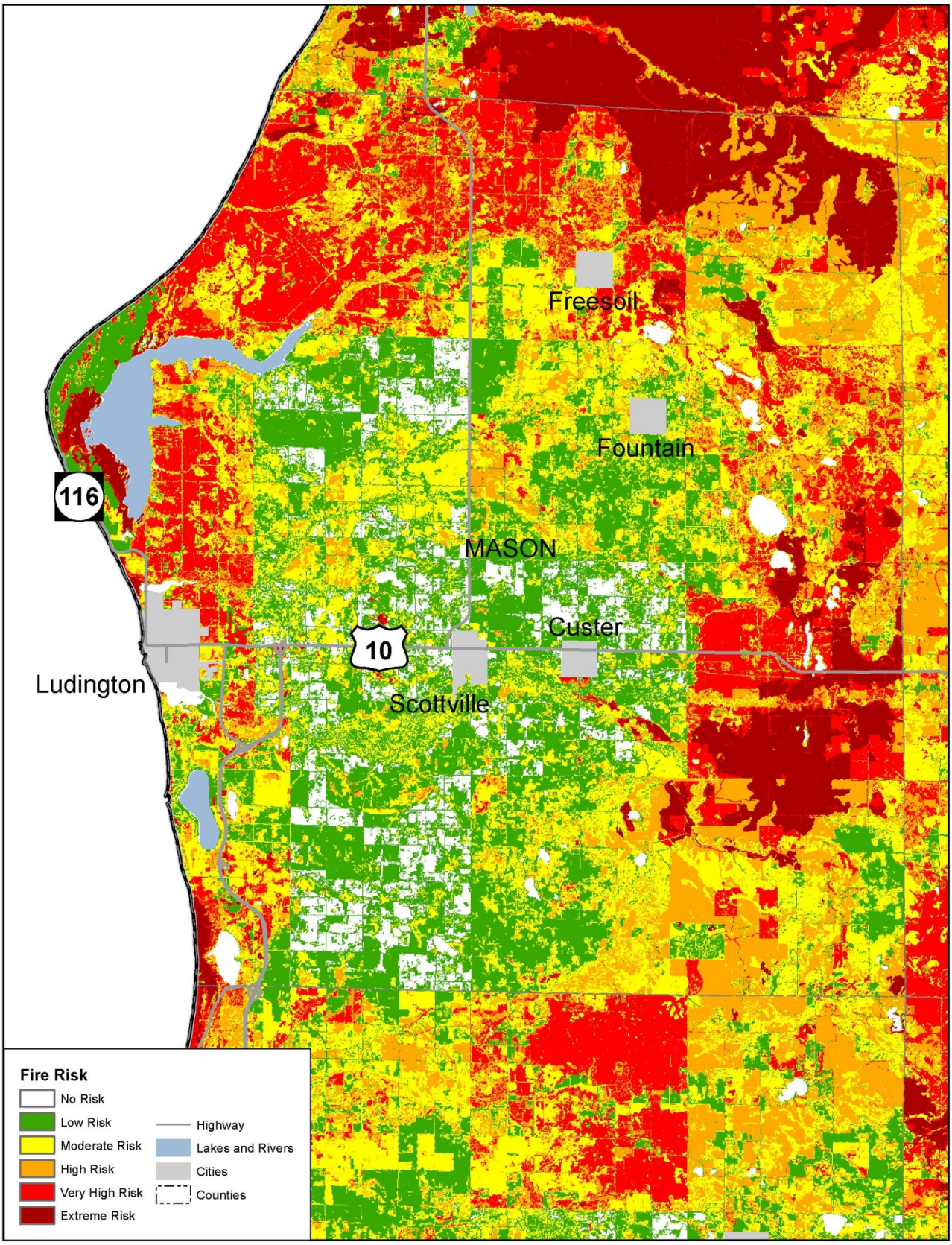
WMSRDC
WEST MICHIGAN SHORELINE REGIONAL DEVELOPMENT COMMISSION

Map created April 2016
Source: USGS National Map, MIGDL, ESRI and Michigan DNR

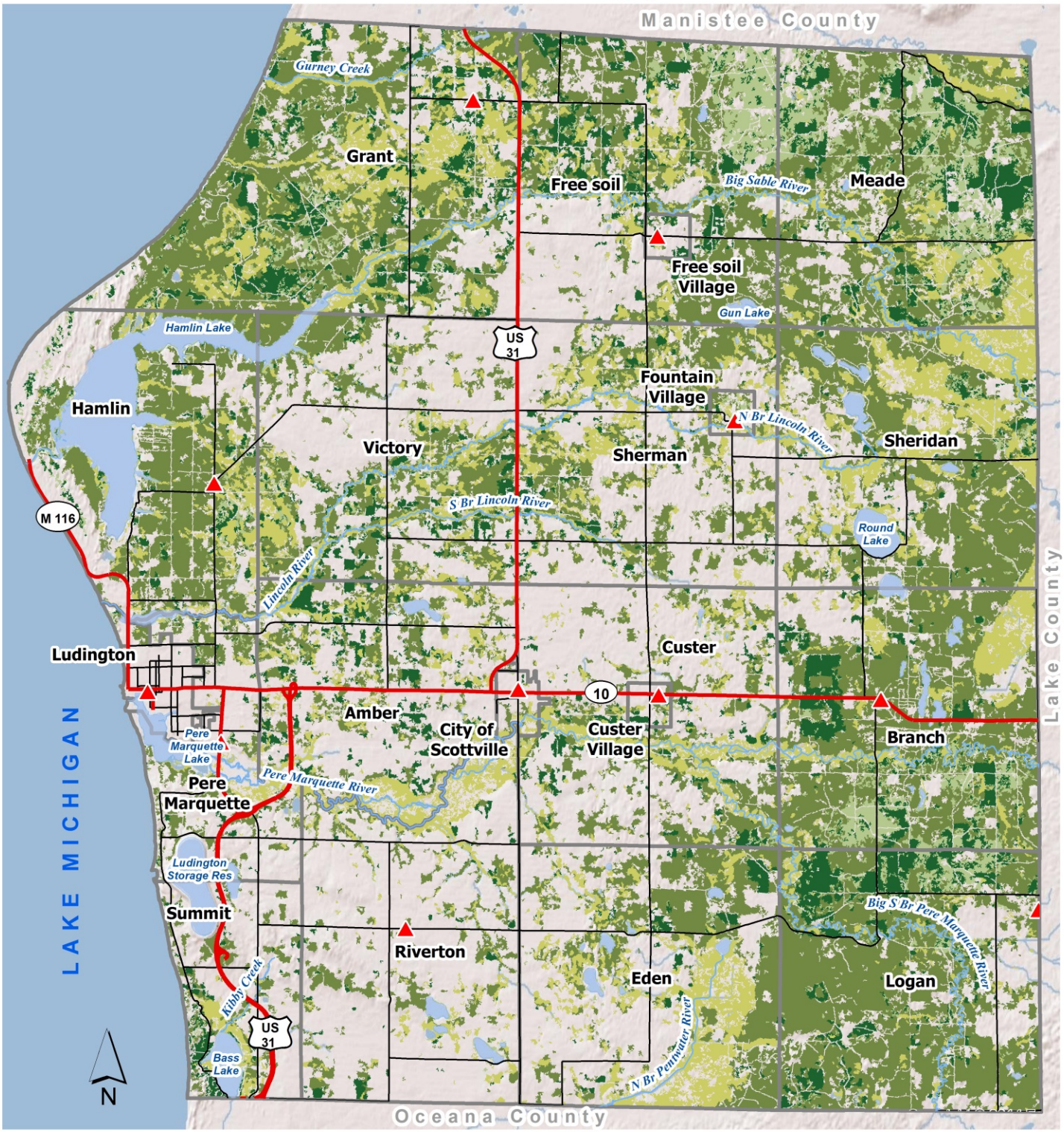
Mason County
Average Year Fire Risk



Fire Risk (MDNR, 2009)



Mason County
Forest Cover Map



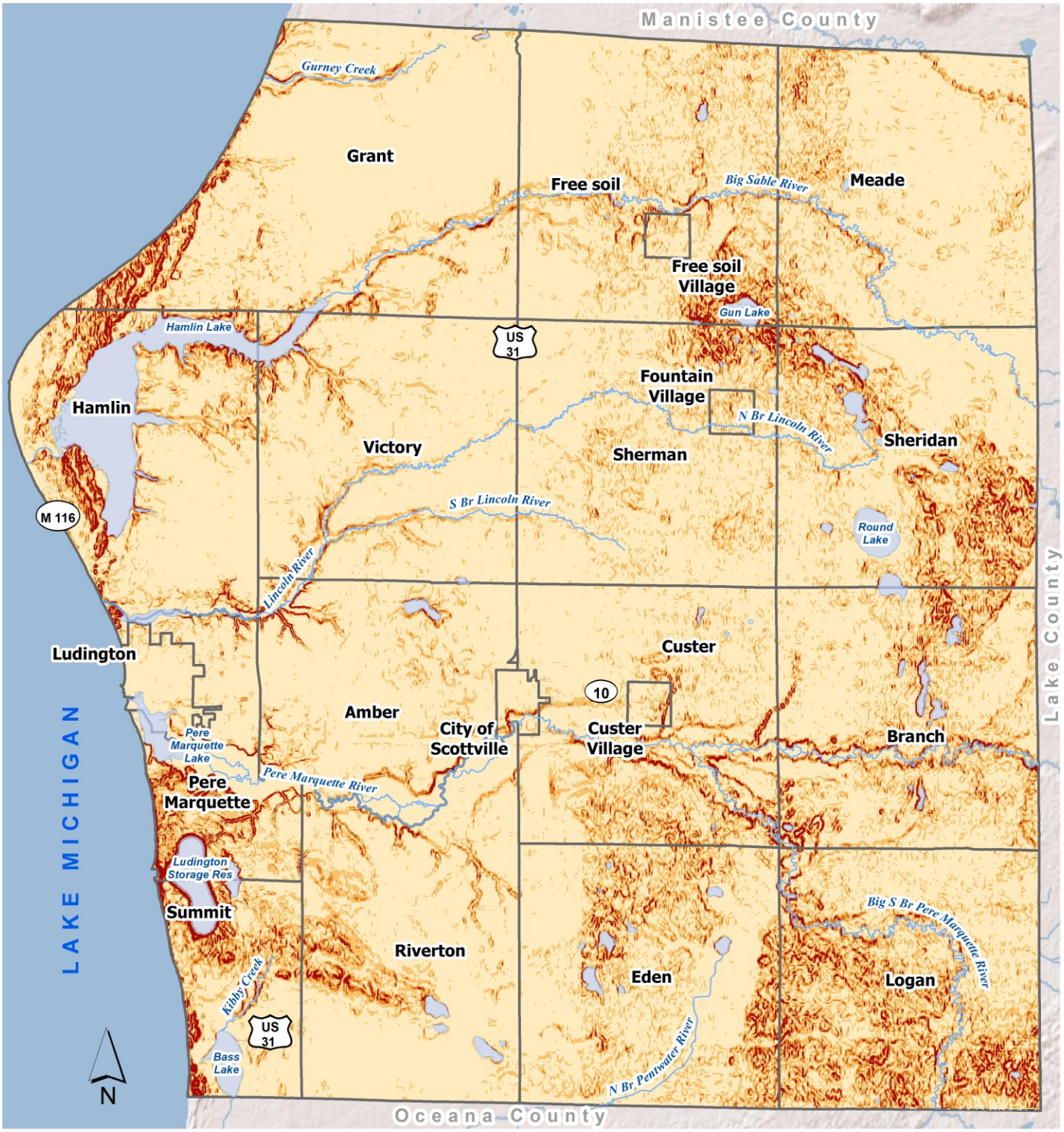
0 2 4 Miles

- Interstate/Trunkline
- County Primary Road
- Fire Station
- Lake
- River
- Woody Wetlands
- Mixed Forest
- Evergreen Forest
- Deciduous Forest

WMSRDC
WEST MICHIGAN SHORELINE REGIONAL DEVELOPMENT COMMISSION

Map created April 2016
Source: USGS National Map, MIGDL, ESRI and Michigan DNR

Mason County
County Slopes Map



0 2 4 Miles

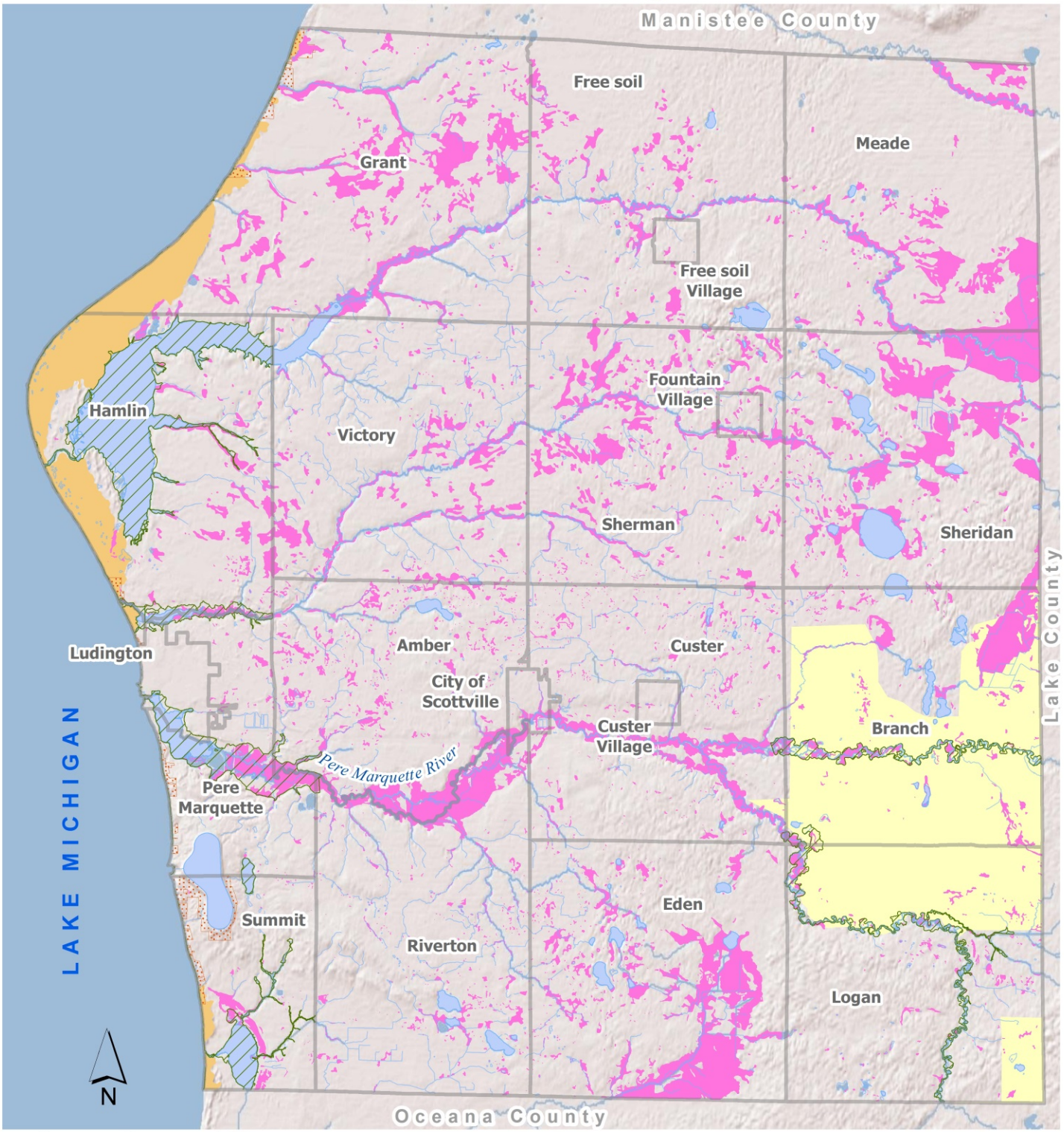
Percentage Slope

- 31% + Severe
- 21 - 30% Significant
- 11 - 20% Moderate
- 19% and below
- Lake
- River

WMSRDC
WEST MICHIGAN SHORELINE REGIONAL DEVELOPMENT COMMISSION

Map created April 2016
Source: USGS National Map, MIGDL, ESRI and Michigan DNR

Mason County
Significant Landscapes



0 2 4 Miles

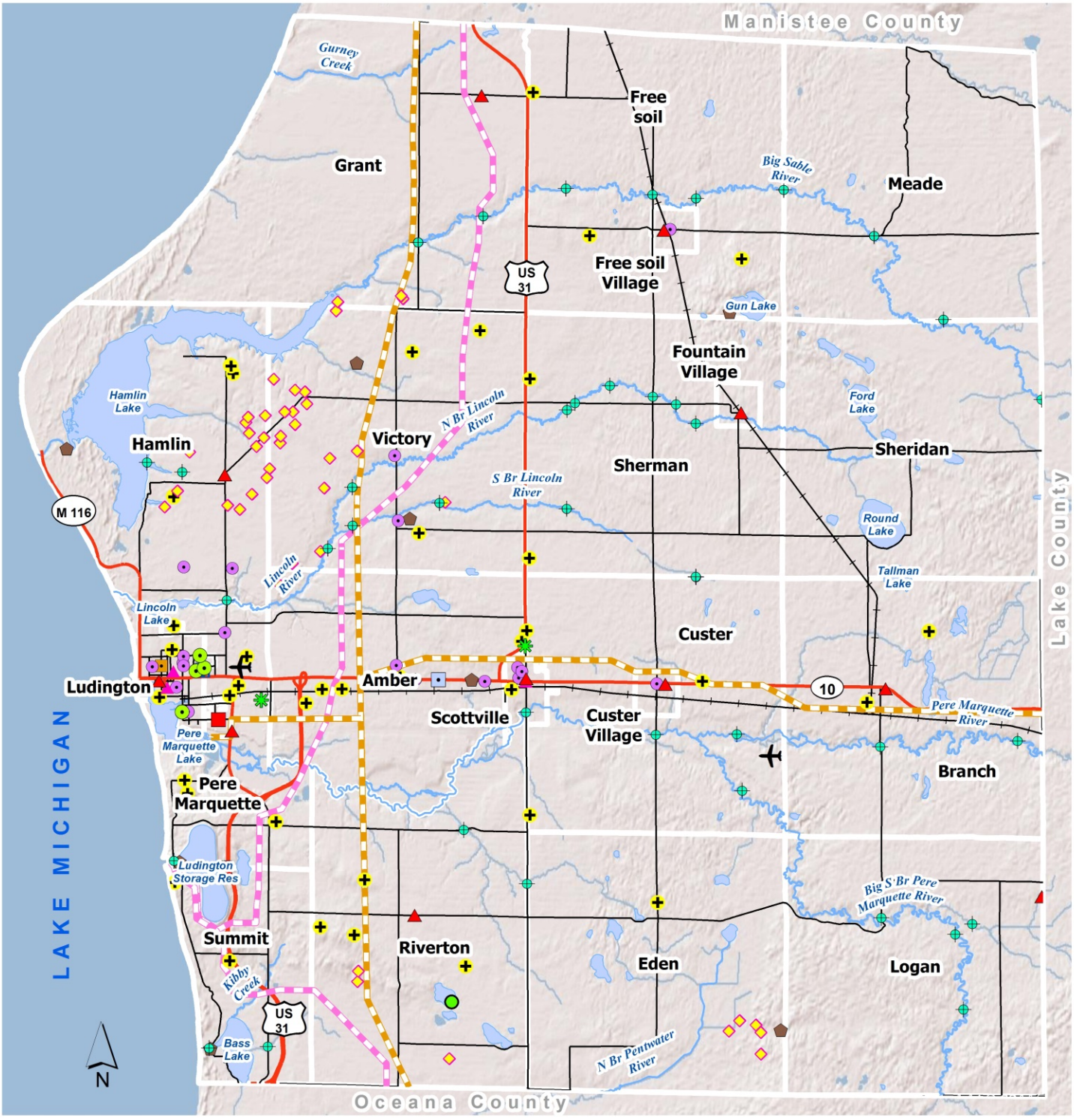
WMSRDC
WEST MICHIGAN SHORELINE REGIONAL DEVELOPMENT COMMISSION

Map created April 2016
Source: USGS National Map, MIGDL, ESRI and Michigan DNR

Wetland
High Risk Erosion Area
Flood Plain
Critical Dune
Karner Blue Butterfly Management Area

In July 1978, the Pere Marquette River and its major tributaries were designated a Michigan Natural River by the State of Michigan. This same year the river was added as a National Wild and Scenic River.

Mason County
Critical Facilities



State Truck Line
County Primary Road
Power Line
Pipeline
Lake
River

Bridge
Power Plant
Police
Fire
EMS

Medical Facility
Hospital
School
Shelter
Dam

Correctional Facility
Airport
Railroad
Communication Tower
H2S Well*

*Oil or gas well know to have detectable levels of hydrogen sulfide

0 2 4 Miles

WMSRDC
WEST MICHIGAN SHORELINE REGIONAL DEVELOPMENT COMMISSION

Map created April 2016
Source: USGS National Map, MIGDL, ESRI and Michigan DNR

04/08/2016

Mason County Bridge List

- Structures that meet the Federal definition of a bridge, a span of 20' or longer -

Road Name	Water Feature	Year Built/ Reconstructed	Status	Posted Load	Jurisdiction
OLD US-31	DURHAM CREEK	1925	Open		Summit
WALHALLA ROAD	S BR PERE MARQUETTE RIVR	1978	Open		Logan
CHAUVEZ ROAD	SWAN CREEK	2014	Open		Riverton
JEBAVY ROAD	LINCOLN RIVER	1988	Open		Pere Marq./Hamlin
LAKESHORE DRIVE	BASS LAKE OUTLET	1900	Open		Summit
LAKESHORE DRIVE	PUMPED STORAGE PENSTOCKS	1970	Open		Pere Marquette
QUARTERLINE RD	BIG SAUBLE RIVER	1966	Open		Grant
SCOTTVILLE ROAD	SWAN CREEK	1900	Open		Riverton/Eden
SCOTTVILLE ROAD	PERE MARQUETTE RIVER	2009	Open		Riverton/Scottville
CUSTER ROAD	PERE MARQUETTE RIVER	1953	Posted	33/38/42	Custer Twp
CUSTER ROAD	BIG SAUBLE RIVER	1981	Open		Free Soil Twp
WALHALLA ROAD	N BR PERE MARQUETTE RIVR	1964	Open		Branch
LANDON ROAD	N BR PERE MARQUETTE RIVR	1979	Open		Branch
STEPHENS ROAD	S BR LINCOLN RIVER	1900	Open		Custer Twp
REEK ROAD	N BR PERE MARQUETTE RIV	2004	Posted	55 Ton	Custer Twp
WILSON ROAD	S BR PERE MARQUETTE RIVR	1900	Posted	27 Ton	Custer Twp
DARR ROAD	BIG SABLE RIVER	2011	Open		Free Soil Twp
STEPHENS ROAD	BIG SABLE RIVER	1900	Posted	30 Ton	Free Soil Twp
LASALLE ROAD	BIG SAUBLE RIVER	2010	Open		Grant
LAKESHORE DRIVE	M BAYOU HAMLIN LAKE	1970	Open		Hamlin
ANTHONY ROAD	S BR PERE MARQUETTE RIVR	1990	Open		Logan
HAWLEY ROAD	S BR PERE MARQUETTE RIVR	1900	Posted	20 Ton	Logan
HAWLEY ROAD	CARR CREEK	1900	Posted	20 Ton	Logan
TYNDALL ROAD	BIG SABLE RIVER	1900	Posted	30 Ton	Sheridan
DECKER ROAD	S BR LINCOLN RIVER	1900	Posted	30 Ton	Custer Twp
DARR ROAD	S BR LINCOLN RIVER	1900	Posted	9/14/25	Sherman
DARR ROAD	N BR LINCOLN RIVER	1900	Closed	3 Ton	Sherman
TUTTLE ROAD	N BR LINCOLN RIVER	1953	Posted	5 Ton	Sherman
STEPHENS ROAD	N BR LINCOLN RIVER	1977	Open		Sherman
FISHER ROAD	LINCOLN RIVER	1900	Posted	20 Ton	Victory
VICTORY CORNER	S BR LINCOLN RIVER	1978	Open		Victory
VICTORY CORNER	N BR LINCOLN RIVER	2000	Open		Victory
AMBER ROAD	S BR LINCOLN RIVER	1978	Open		Victory
FREESOIL ROAD	BIG SAUBLE RIVER	1960	Open		Meade
LINCOLN ROAD	TRIB TO MIDDLE BAYOU	2009	Open		Hamlin
YOUNKERS ROAD	BIG SAUBLE RIVER	1960	Open		Meade
FOUNTAIN RD	N BR LINCOLN RIVER	1960	Open		Sherman
CUSTER RD	N BR LINCOLN RIVER	1960	Open		Sherman
SCHOENHERR RD	BIG SABLE RIVER	1960	Open		Free Soil/Meade
FOUNTAIN ROAD	N BR LINCOLN RIVER	1960	Open		Sherman
TAYLOR RD	WELDON CREEK		Posted	3 Ton (1 lane)	Branch
BENSON RD	WELDON CREEK		Posted		Branch
BEYER RD			Closed		Sherman

Appendix D

ACKNOWLEDGEMENTS

This plan was made possible with a grant from the Community Wildfire Protection Plan Grant Program of the Michigan Department of Natural Resources.

An exceptional degree of participation was exhibited during the planning process. The following entities participated during the planning process:

Local Fire Departments

Branch Fire Department	Hamlin Fire Department
Carr Fire Department	Ludington Fire Department
Custer Fire Department	Pere Marquette Fire Department
Free Soil Fire Department	Riverton Fire Department
Fountain Area Fire Department	Scottville Fire Department
Grant Fire Department	Mason County Rural Fire Authority

Mason County Agencies & Departments

Emergency Management	Road Commission
Equalization	Planning and Zoning Department

State of Michigan

MDNR – Forest Resources Division	Ludington State Park

United States Forest Service

Manistee and Mason-Lake Conservation Districts

West Michigan Shoreline Regional Development Commission

A number of resources and documents were researched and referenced during the development of this plan. The following documents were most helpful during this process.

- Newaygo County CWPP (2010)
- Oceana County CWPP (2014)
- Community Guide to Preparing and Implementing as Community Wildfire Protection Plan (2008)
- Preparing a Community Wildfire Protection Plan (2004)

GIS information used during the formation of this plan was obtained from the following sources.

U.S. Forest Service	Michigan Geographic Data Library
U.S. Geological Survey	WMSRDC
LANDFIRE	ESRI
Multi-Resolution Land Characteristics Consortium	

316 Morris Avenue - Suite 340 - Muskegon, MI 49440-1140
Telephone: 231/722-7878 - Fax: 231/722-9362
www.wmsrdc.org