

2011

Eastern Delta County Community Wildfire Protection Plan Bay De Noc, Ensign, Masonville, Nahma, & Garden Townships



Prepared for:

Eastern Delta County and
Hiawatha National Forest

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I. Introduction

Wildland fire is an essential element that has shaped ecosystems and life around Earth. Over time, forests and other habitats evolved their own signature fire regime—an imprint of the role of fire in that area, characterized by fire frequency, intensity, severity, duration, size and the season in which it occurs. Without periodic fire, many plants and animals requiring nutrients and vegetation brought about by cyclical wildland fire, disappear. Wildland Fire promotes vegetative and wildlife diversity and eliminates the heavy fuel accumulations which can ultimately lead to extreme and catastrophic wildfire.

Before human settlement, wildland fires were typically caused by a combination of natural disturbances such as lightning strikes, drought, or fuel loading from wind and/or insect and disease. Wildland fires burned until natural forces such as rain put them out.

Today, fire patterns are no longer natural. For about the last century, wildland fire has been actively suppressed in many natural areas causing heavy accumulations of vegetative fuels which have often resulted in catastrophic wildfire of more intensity and severity and long-lasting damage. Additionally, human development has increasingly moved into or very near forests and other natural areas putting human life and property at greater risk.

The risks of extreme, uncontrolled wildfire cannot be completely eliminated, but with proactive planning, education, and conservation based vegetative fuel reductions, the risk posed to humans and nature can be substantially reduced. **Land managers and residents who live and work in and near natural areas have a challenge to maintain and restore the landscape to a more natural pre-suppression condition of reduced vegetative fuel accumulations in forests, grasslands, and wetlands, and around homes and other structures.** By doing so, risks to human life and property are also can be reduced and forest health restored and maintained.

While wildfire does not capture the attention of Delta County residents like it does many communities of the western United States, there is sufficient wildfire risk in eastern Delta County to justify planning and action to mitigate the risk. Many of the forests in the planning area contain highly flammable trees such as jack pine and red pine that will eventually burn with potentially catastrophic consequences. In 1988, the Stockyard fire burned 1,100 acres of jack pine forest on the Stonington Peninsula. Since that time, new homes have been built and more are planned, increasing the risks of catastrophic wildfire.

Background

This document is being written as a Community Wildfire Protection Plan (CWPP) in order to meet the requirements of the Healthy Forests Restoration Act (HFRA) of 2003 which seeks to reduce the risk of catastrophic wildfire through reduction of forest fuels in National Forests and through the completion of CWPP's for communities within the Wildland Urban Interface (WUI). The wildland urban interface is the zone where structures and other human development meet and intermingle with undeveloped wildland or vegetative fuels.

The HFRA encourages the United States Forest Service (USFS) to consider the priorities of local communities when planning and implementing forest management and hazardous fuel reduction projects, but the community must first complete a CWPP. The CWPP process can help communities identify and clarify priorities for protection of life, property, infrastructure and other values in the WUI.

Additionally, a CWPP qualifies at risk communities within the WUI to apply for National Fire Plan and other government funding sources meant to reduce wildfire risk, and to provide community direction for federal lands

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management within the planning area. At least 50% of all funds appropriated under the HFRA must be within the WUI, and HFRA gives priority to projects and treatment areas identified in the CWPP.

The basic requirements of a CWPP are minimal, and allow for communities to determine any additional content beyond the following minimum requirements:

1. Collaboration among local, state, federal and other interested parties.
2. Prioritize and identify hazardous fuel reduction projects to protect high-risk communities.
3. Recommend measures that communities and homeowners can take to reduce ignitability of structures.

Planning Process

The CWPP process generally followed the recommendations of the document *Preparing a Community Wildfire Protection Plan – A handbook for Wildland Urban Interface Communities 2004*. The planning process began in October of 2010 and concluded on November 30, 2011.

Step 1: Convene decision makers from local governments, local fire authority, and state and federal agencies responsible for forest management.

Step 2: Engage other interested groups or stakeholders.

Step 3: Establish a community base map.

Step 4: Develop a Community Risk Assessment that identifies the areas at greatest risk.

Step 5: Establish Community Priorities and Recommendations to reduce wildfire risk.

Step 6: Develop an Action Plan and assessment strategy to reduce wildfire risk and establish a monitoring plan to ensure the plan has long-term success.

Step 7: Finalize the plan through local government approval and communicate the plan results to the community.

Community Participation

Early in the collaboration process, a planning committee was created from the five townships covered in the plan and an initial committee brainstorming session (Appendix A.) was held to identify wildfire issues. The committee provided local input and ongoing review throughout the process. An open public meeting was held in December 13, 2011, to gather approval signatures from the committee and present and distribute the final CWPP.

Providing community education and



“Are You Fire Ready” presentation by MSU Extension in Rapid River © Chris Cantway/TNC.

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outreach to increase wildland fire awareness and reduce ignitions to community assets and values is one of the overall plan priorities. To meet this priority, all community planning meetings were open to the public and were held at various locations throughout the planning area. Flyers were posted and announcements were posted into local media for select meeting dates.

CWPP Planning Committee		
Name	Agency	Position
Chris Cantway	The Nature Conservancy- MI	Plan Author and Facilitator
Dave Silvieus	Hiawatha National Forest	District Ranger
Gary Olson	Hiawatha National Forest	Fire Management Officer
Keith Murphy	Michigan DNR	Fire Officer
John Wolf	Ensign Township	Township Supervisor
Ginny Dahlin	Bay De Noc Township	Township Supervisor
Pete Brock	Masonville Township	Township Supervisor
Morgan Tatrow	Garden Township	Township Supervisor
Alan Novak	Ensign Township VFD	Chief
Jerry Wilson	Ensign Township VFD	Fire Fighter
Craig Lancour	Ensign Township VFD	Fire Fighter
Wayne Clement	Nahma Township VFD	Chief
Bob Stone	Masonville Township	Chief
Keith Farley	Garden Township	Chief
Rocky Van Dorn	Tri-County VFD	Chief
Bob Berbohm	Delta County	Emergency Manager
Don Howlett	None	Citizen

CWPP Development Meetings			
Date	Time	Meeting Type	Location
October 15, 2010	10:00am-1:00pm	Organizational	Bay De Noc Township Hall
December 2, 2010	6:30-8:30pm	Information gathering	Ensign Township Hall
March 3, 2011	6:30-8:30pm	Information gathering; Firewise & Ecological Role of Wildland Fire presentation	Masonville Township Hall
May 11, 2011	7:00-8:30pm	Information gathering	Nahma VFD Hall
July 26, 2011	6:30-8:30pm	“Are You Fire Ready” Presentation	Tri-County Fire Hall
August 10, 2011	6:30-8:30pm	“Are You Fire Ready” Presentation	Masonville Township Hall
December 13, 2011	6:30-8:00pm	Plan Presentation and Approval	Masonville Township Hall

II. Overall Plan Goals

Purpose and Vision

The primary purpose of the Eastern Delta County Community Wildfire Protection Plan (Eastern Delta County CWPP) is to reduce wildfire risk to human life, property, infrastructure and other values in the Wildland Urban Interface (WUI) of eastern Delta County through a collaborative process across multiple townships. Eastern Delta County communities recognize that they should take into consideration factors such as healthy and resilient forests, intact wildlife populations and habitat, recreation and other values when planning, prioritizing and implementing this CWPP.

The overall future vision is to minimize risk in areas where wildfire can be destructive to people and their values while allowing wildland fire to play a more natural role in places where it benefits people and nature and restores healthy and resilient forests and other habitat types, over the long-term.

On Federal Lands the forest has a reduced risk from catastrophic wildfire due to healthy forests and increasing resilience to the effects of wildland fires. Accumulations of natural and activity fuels are treated to enhance ecosystem resiliency and to maintain desired fuel levels. Prescribed fire is present on the landscape, restoring or maintaining desirable plant community attributes, processes, and functions. Wildland fire is actively suppressed, where necessary to protect life and valuable resources.

On State Forest Lands the forest is managed to maintain fuel loads within the range of natural specific ecosystem variability in order to minimize adverse effect to ecological and socioeconomic values. Prescribed fire is implemented as a natural management tool, within the context of other ecological and socio-economic uses. The forest is free from human-caused wildfire, in order to minimize adverse effect to ecological and socio-economic values. The DNR protects the health and safety of the public by effectively coordinating the suppression of wildfires that occur upon all ownerships within a protection area, incorporating the need to protect private property and ecological and socio-economic values, and also ensuring the health and safety of firefighters.

On Non-Federal Private WUI Lands private land owners understand the ecological value of wildland fire and know how to live safely in areas at risk for wildfire. Firewise and Defensible Space concepts are promoted and implemented in order to allow fire to move through communities with minimal damage to human values and maximum benefit to forests and nature.

Healthy and resilient landscapes will have greater capacity to survive natural disturbances such as wildland fire and large scale threats to sustainability, especially under changing and uncertain future environmental conditions such as those driven by climate change and increasing human uses.

Priorities

The plan priorities identify the primary steps that should be taken throughout the planning process and beyond, in order to meet the plan objective.

1. Spatially identify and evaluate wildfire risk by completing a wildfire risk assessment.
2. Identify vegetative fuel reduction projects on public and/or private lands within or near the Wildland Urban Interface that reduces risk to structures and other human values and restores forest health in fire adapted ecosystems.

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3. Identify and provide targeted community education and outreach that promotes the use of Firewise concepts in order to create conditions that allow for wildland fire to occur without the loss of human lives, homes and infrastructure and other values.
4. Identify fire preparedness and protection improvements to minimize structural ignitions and improve emergency response.
5. Use this CWPP as a first step in the planning and implementation of effective long-term wildfire mitigation and forest restoration activities.

Fire Safety Objectives

The Fire Safety Objectives should be used as an overarching guide during the planning and implementing of any future mitigation actions and monitoring.

Minimize Unplanned Ignitions

Unplanned ignitions should be minimized. Most human ignitions occur near human infrastructure and assets. Fewer unplanned ignitions lead to fewer wildfires and less risk to communities. Numerous ignitions strain fire-fighting resources, which can lead to greater risk to communities.

Decrease Fire Intensity and Severity

High-intensity fires cause greater damage to structures as greater heat is transferred to structures. High-intensity fires also are most likely to produce crown fires and torching. Embers created from crown fires are lofted ahead of the fire front, creating spot fires, and are often the cause of structures burning. The level of fire intensity greatly influences the damage to natural resources. Every ecosystem is adapted to a range of fire intensities. Higher-intensity fire can cause more severe damage, such as erosion, degraded water quality, tree mortality, visual blights, and a decline in certain wildlife habitats.

Decrease Damage to Human Communities

Fire is part of the natural ecology of the forests of Michigan; especially in fire adapted forest systems such as jack pine forests and other pine forests. Wildfire damage to structures and other human assets and values needs to be minimized while allowing fire to burn where harm can be avoided.

Increase Permeability of Human Communities

The concept of permeability describes the situation where fire can spread through a community achieving its ecological role, with minimal negative impact on communities. In this scenario, vulnerable resources are protected while fire burns as nearly as possible under its normal regime.

Increase Resiliency of Human Communities

It is desirable to rebound quickly after a wildfire burns through or near a community. Fires of small size or limited damage support a more rapid recovery. Communities with greater preparation for wildfires (defensible space, Firewise construction, rehearsed evacuations, established communication protocols, adequate water sources, etc.) also have greater resiliency.

III. Planning Area Description

Geography

The planning area is located in Delta County, Michigan and covers the townships of Bay De Noc, Ensign, Masonville, Nahma and Garden. Delta County is located in the south central portion of Michigan's Upper Peninsula. The area has no cities, one village (Garden) and 13 unincorporated areas.

The area is bounded on the south by 116 miles of northern Lake Michigan shoreline. The northern and eastern boundaries are bordered by Alger and Schoolcraft Counties. Elevations range from 577 feet at Lake Michigan to as high as 960 feet with little relief in most areas. There are many small inland lakes and rivers and streams, with the Whitefish and Sturgeon Rivers being the major rivers. Small inland lakes are most highly concentrated in northeast Delta County. The area encompasses approximately 700 total square miles; 89% of that is land.

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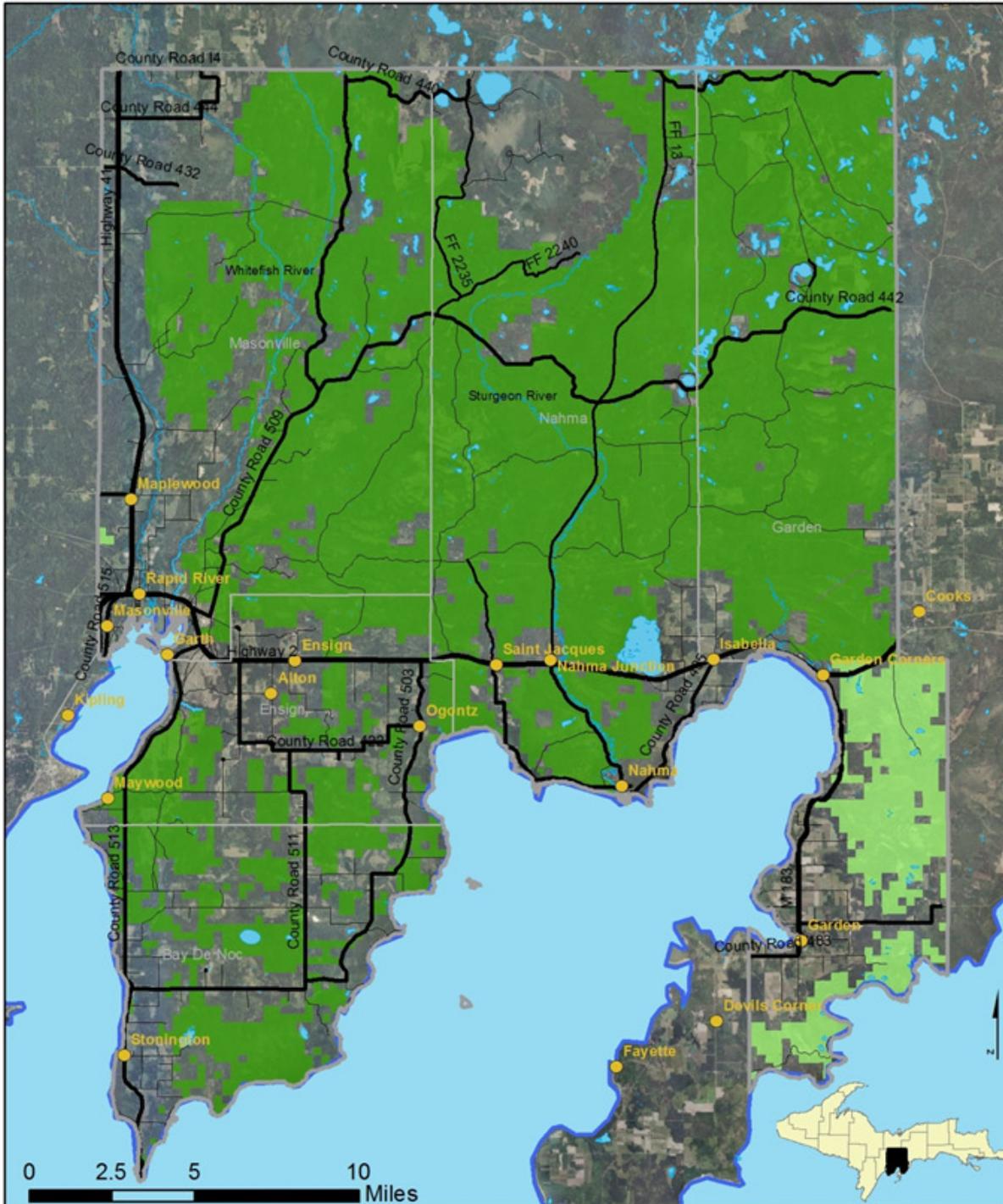
Planning Area Base Map



Protecting nature. Preserving life.™

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- | | |
|----------------------|------------------------------------------|
| Roads | Lakes and Rivers |
| Highways | Population Centers |
| County Roads | Planning Area Townships |
| Federal Forest Roads | Public land |
| Local Access Roads | U.S. Forest Service |
| | Michigan Department of Natural Resources |



Structures were located using a spatial dataset from Hiawatha National Forest. These are basically the ‘black dots’ that represent structures on the quad sheet maps, originally identified by photo interpretation when the maps were created/revised. They are likely only as current as last photo-revision of quad maps in the mid 1990s, but they have been reviewed for accuracy against a 2010 aerial photo with new structures added, and missing structures removed. Structures were not separated into specific categories so that they may be homes, businesses or any other structure type.

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Population

Population density of the planning area is low with seven persons per square mile. According to US census data, resident populations have declined in all townships from 2000 – 2010 with an average population decline of -5.6% for the planning area.

Township	Total Land Area in Square Miles	Total Water Area in Square Miles	Total Area in Square Miles	Total Population (2010 Census)	Total Population Density Per Square Mile of Land Area
Bay De Noc	67.48	23.57	91.06	305	4.52
Ensign	58.97	6.82	65.79	748	12.68
Garden	159.92	24.46	184.39	750	4.69
Masonville	167.67	2.74	170.41	1,734	10.34
Nahma	166.24	22.63	188.87	495	2.98
Totals	620.28	80.22	700.52	4,032	7 (average)

Climate and Weather

Precipitation and temperature vary spatially across the planning area as well as seasonally. In Escanaba, Michigan, summers temperatures average 60s-70s (Fahrenheit), while winters are cold averaging in the 20s. July tends to be the warmest month and January the coolest. Areas nearest to Lake Michigan's influence tend to have warmer winter temperatures and cooler summer temperatures than those further inland. Precipitation can vary depending on the influence of Lake Michigan. Precipitation tends to be greater in summer than in winter with July averaging about 3.5" and January just over 1". Winter snowfall averages about 55" per year, increasing as one moves north. Afternoon thunderstorms average about 30 during the summer months. Seasonal variations can include extreme drought or abundant precipitation.

Economic Setting

The area is predominantly rural with an economic base consisting primarily of service, recreation and tourism, and natural resource extraction. Recreation and tourism includes hunting, fishing, camping, snowmobiling, ORV riding, horseback-riding, hiking, bird watching and sight-seeing. Seasonal homes and cabins, rentals, and hunting camps are also common.

The primary resource extraction activity is timber extraction on Hiawatha National Forest and large and small private timber tracts. Other smaller scale resource activities include fishing and farming. Farming is primarily located on the Stonington and Garden Peninsulas. Commercial and industrial development is limited and tends to be concentrated in or near small communities. Small-scale retail, lodging and food service is concentrated along major roads, highways and in small communities. Most people commute out of the planning area to work in Escanaba and Manistique. Primary centers of commerce include Rapid River and Garden.

Community Assets and Values At Risk in Planning Area

Sensitive Facilities

Sensitive facilities are assets that may be at risk from wildfire and which may be negatively impacted, damaged or destroyed. These include homes, businesses, industry, schools, etc. and have not all been individually identified. Township Volunteer Fire Departments should ensure all sensitive facility locations are identified and have adequate defensible space.

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Type	Location
Township Halls	Bay De Noc; Ensign; Masonville; Nahma; Garden Townships
Rapid River Public Schools	Masonville Township
Big Bay De Noc School	Garden Township
Homes	All Townships
Businesses	All Townships
Industry	All Townships
Tourism	All Townships

There are approximately 3719 housing units in the planning area. Homes may be permanent or seasonal dwellings. Rapid River, Garden village, and Nahma have the highest concentration of homes. Elsewhere, concentrations of both permanent and seasonal residential homes tend to be found around shorelines of lakes and rivers and along major roads, although they are located throughout the planning area in lower concentrations.

Total housing units by township (2010 census)	
Township	Housing Units
Bay De Noc	545
Ensign	569
Garden	715
Masonville	1,212
Nahma	678
Total	3719

Commercial structures including motels, gas stations, and small retail and grocery stores are concentrated in Rapid River and along primary roads and highways such as US-2. Other common commercial structures include industrial facilities and tourism facilities such as resorts and cabins. Tourist facilities tend to be concentrated around lakes, rivers and roads.

Essential Infrastructure

Essential infrastructure are those facilities that may be at risk from wildfire and which may be important or essential for emergency response in the event of wildfire. These include fire stations, gas lines, electric, water sources, escape routes (roads), and public buildings. There are no hospitals in the planning area. The nearest hospitals are OSF St. Francis in Escanaba, Schoolcraft Memorial in Manistique, and Munising Memorial in Munising. Township fire departments should ensure all essential infrastructure is identified and has adequate defensible space.

Essential Infrastructure Types	
Type	Location
Fire Stations	Ensign; Masonville; Nahma; Garden; Tri-County (Alger County)
Gas Pipelines and Hubs	All
Primary Electrical Lines	All
Communication Towers	All
Substations	All

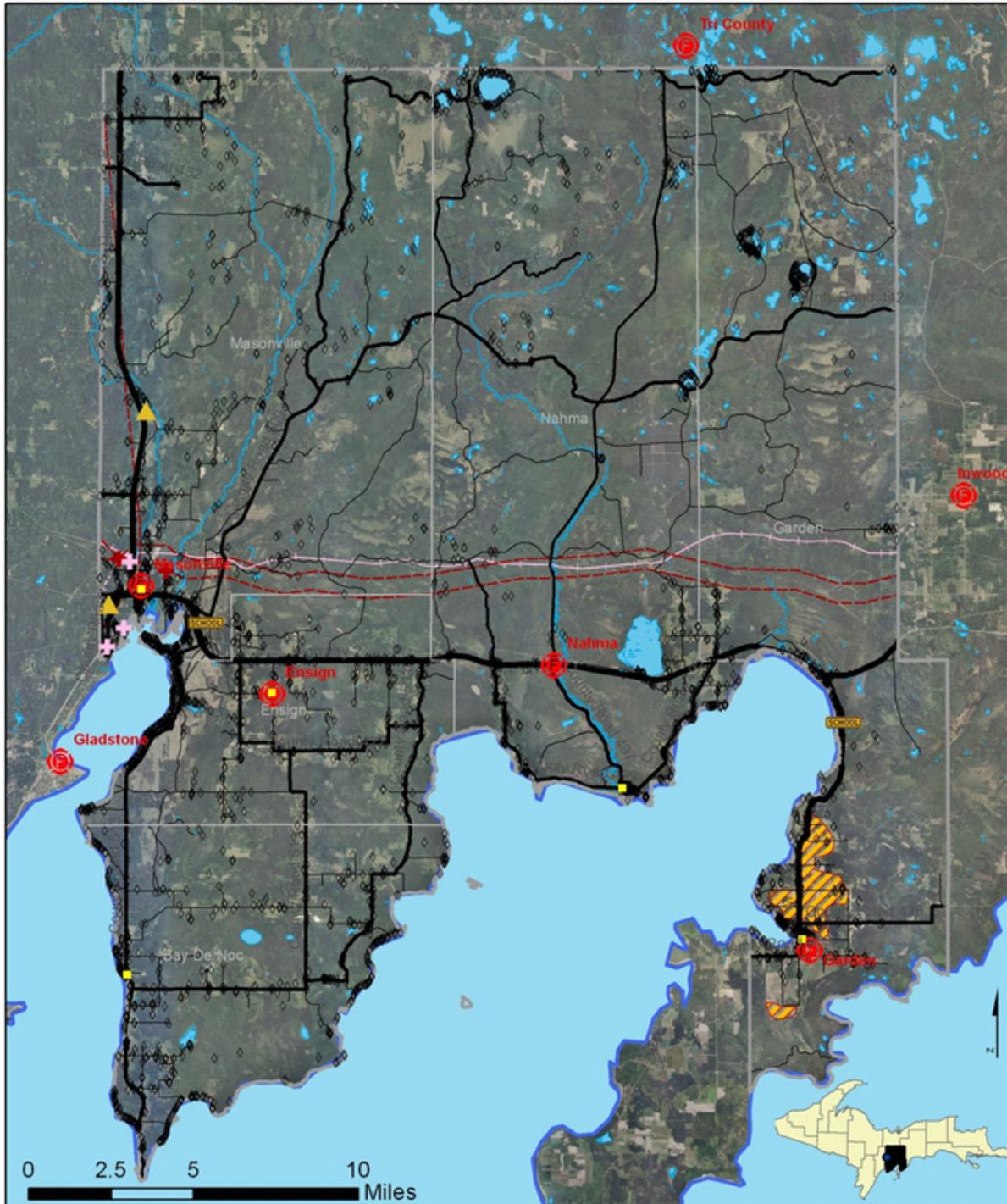
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Sensitive Facilities and Essential Infrastructure

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- | | | | |
|-----------------------|---------------------------|----------------------|----------------------|
| Schools | Gas Transmission Stations | Roads | Proposed Wind Farm |
| Township Halls | Communication Towers | Highways | Natural Gas Pipeline |
| Fire Stations | Other Structures | County Roads | Power Lines |
| Electrical Substation | Planning Area Townships | Federal Forest Roads | |
| | | Local Access Roads | |



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Transportation Infrastructure

The planning area townships are served by a network of state, county, local, and federal roads and logging trails. The primary state highways are US-2 and US-41. Several county roads bisect the planning area. There are approximately 800 miles of federal roads in Hiawatha National Forest. FFH 13 is the primary forest road and runs south to north from Nahma Junction to Alger County. A total of about 125 miles of federal high-grade forest roads traverse the planning area.

Road conditions vary throughout the planning area, but range from paved 2-lane roads to the many dirt or sand roads passable to 4x4 vehicles only. Roads that have in the recent past been passable may become impassable due to weather, and/or rutting from logging trucks or other vehicles.

Recreation Infrastructure

Tourism and recreation facilities are common in the planning area and contribute to the local economy. Campgrounds and other recreational assets were identified as values to be protected.

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Recreation Values

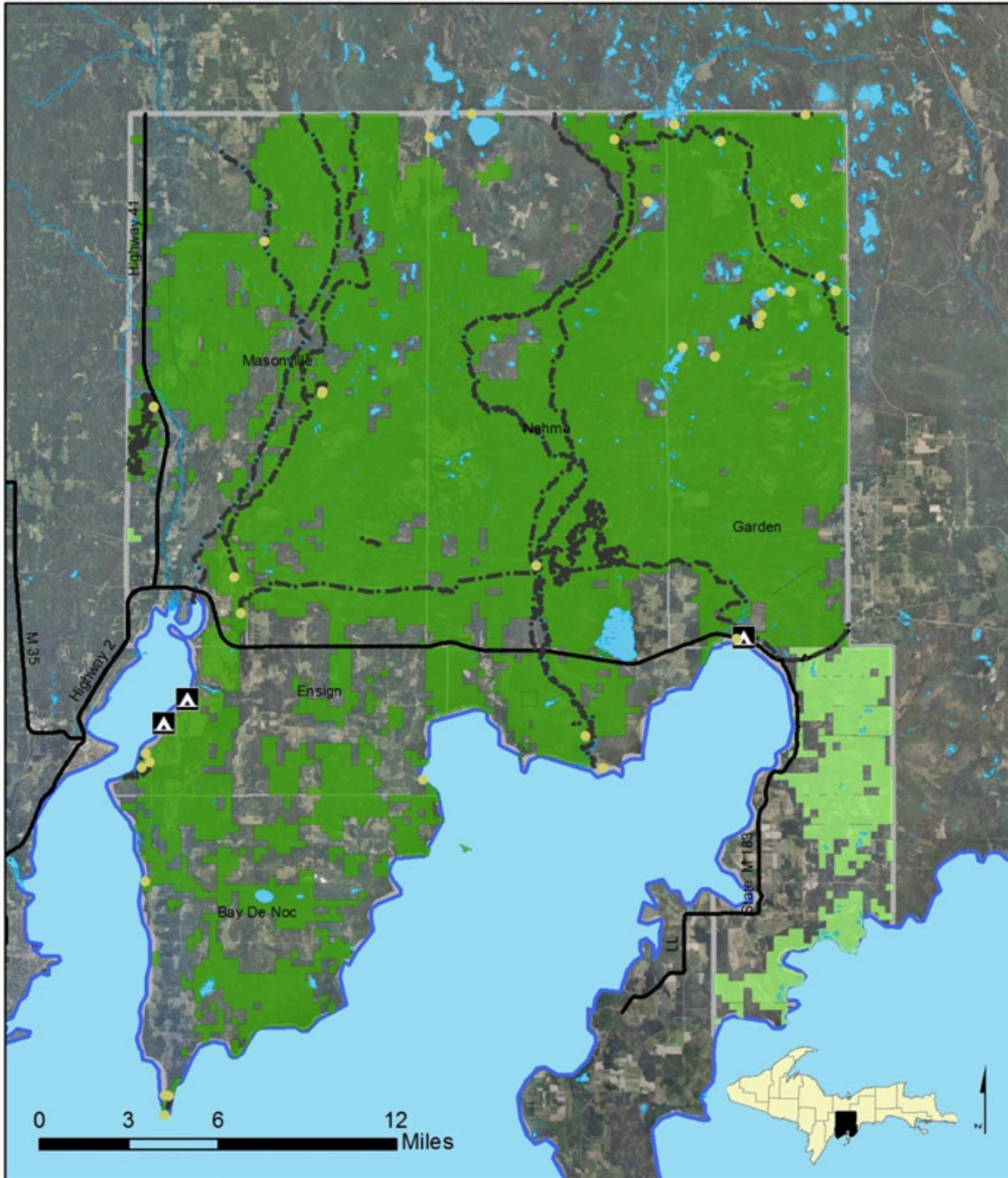


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- Recreation Sites - USFS
- ▲ Private Campgrounds
- Trails

Public Land

- Hiawatha National Forest
- Michigan Department of Natural Resources



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Ownership

65% of the planning area is held by federal and state agencies. The Hiawatha National Forest has the largest land holdings within the planning area at about 61%, followed by private (Other) holdings such as private industrial forestry tracts and other smaller forestry tracts. Michigan Department of Natural Resources has very limited holdings within the planning area, concentrated primarily in Garden Township.

Major Land Ownership	Number of Acres	Percent of Planning Area
Hiawatha National Forest West Zone	244,745	61
Michigan Department of Natural Resources – State Forest	17,353	4
Private Other	139,250	35

Vegetation Land Cover Types

The planning area is approximately 75% forested. Forested and non-forested wetlands cover approximately 10% of the planning area landscape. The most highly flammable vegetation type in the planning area is jack pine and to a lesser degree the other conifers such as red pine, white pine and spruce.

Jack pine stands are typically found in sandy, dry sites. They are a fire-dependent tree species which have frequent fire intervals typically less than 50 years, with high severity fire. Dense, young stands of jack pine are highly susceptible to crown fire and can be very difficult to control as are diseased stands of jack pine.

Red pine stands are typically found in sandy soils often co-inhabiting with jack pine and white pine. Red pine is a fire-dependent, fire-resistant (mature trees with thick bark, high crowns-lack of ladder fuels, etc) tree species with approximate fire regimes of 20-40 years for low to moderate severity fires, and 150-200 years for high severity fires.

White pine stands are found in a variety of soil types but survive best in sandy soil types. They are moderately fire-resistant, with typical fire regimes of less than 50 years for low severity fires, and 150 years or greater for high severity fires.

Grasslands, shrub lands and some wetlands can also be highly flammable especially during drought years and/or if they are adjacent to other highly flammable forests.

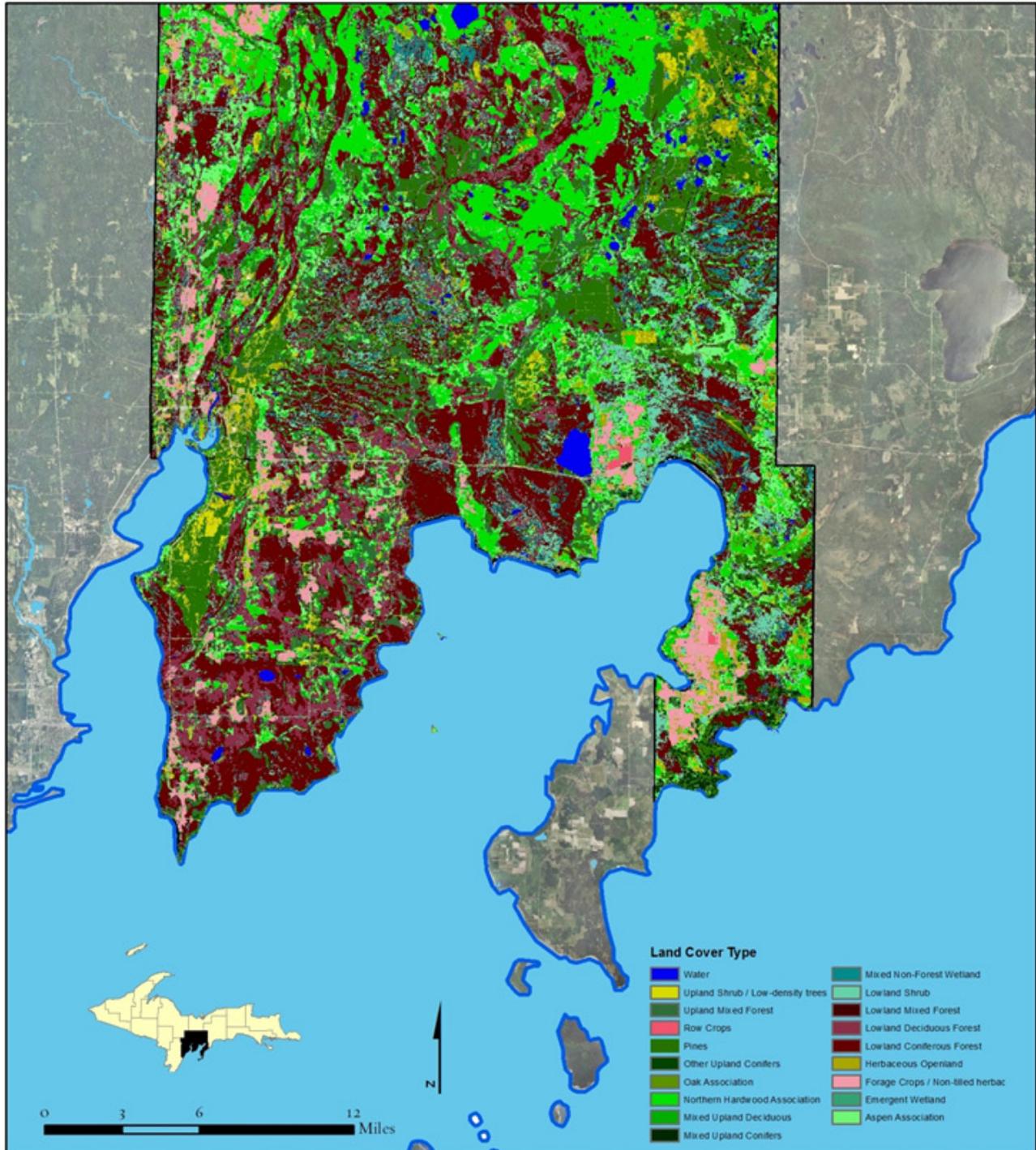
Northern hardwood forests are less flammable and burn infrequently. Hardwood forest wildfires are rarely catastrophic.

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Land Cover Types



Data Source: IFMAP, MDNR, Forest, Mineral and Fire Management Division-2003

Land cover data for the Upper Peninsula of Michigan derived from classification of Landsat Thematic Mapper (TM) imagery. Image dates between 1997-2001 were used to identify land cover classes. Imagery from three seasons was used in the classification: Spring (Leaf-off), Summer, and Fall (Senescence). Pine, Upland shrub/low density trees, upland conifers, and mixed upland conifers are the most flammable vegetation types.

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Significant Species, Landscapes and Pests

Many plants, animals, and landscapes are rare or threatened and require special protection or management. Potential effects should be considered before any planning actions are implemented in order to minimize impacts and maximize benefits to significant species and landscapes and to ensure actions are legal.

Significant Species

Below is a list of Federally Threatened and Endangered Species and Regional Forester Sensitive Species (RFSS) from the Hiawatha National Forest Plan 2006. Other species are identified by the State of Michigan. Consult with the Michigan Natural Features Inventory (MNFI) website (<http://web4.msue.msu.edu/mnfi/>) for Michigan special species and communities.

Species	Type	Habitat	Protection Level
American Bittern and Yellow Rail	Bird	Sedge marsh	RFSS
Peregrine Falcon	Bird	Open landscapes with cliffs or nesting boxes	RFSS
Black-Backed Woodpecker	Bird	Mature and recently burned forest	RFSS
Black Tern, Common Loon, Trumpeter Swan	Bird	Inland lakes	RFSS
Canada Lynx	Mammal	Contiguous forest tracts	Threatened
Hine's Emerald Dragonfly	Insect	Calcareous spring fed marshes and sedge meadows	Endangered
Kirtlands Warbler	Bird	Jack pine forest	Endangered
Lake Sturgeon	Fish	Whitefish and Sturgeon rivers	RFSS
Northern Goshawk and Red Shouldered Hawk	Bird	Forests and wetlands	RFSS
Piping Plover	Bird	Great lakes open, sandy shoreline	Endangered
Sharp-Tailed Grouse	Bird	Grassland, open woodland, agricultural	RFSS
Dwarf Bilberry	Plant	Dry Northern Forests and wetlands	RFSS
Dwarf Lake Iris and Houghton's Goldenrod	Plant	Great Lakes shoreline	Threatened
Hart's Tongue Fern	Plant	Shaded, moist boulders and ledges of Niagaran Dolomite	Threatened
Lakeside Daisy	Plant	Alvar	Threatened
Pitcher's Thistle	Plant	Great Lakes shoreline sand dune/beach	Threatened

The Stonington and Garden Peninsulas are important migratory land bird and raptor stopovers as well as critical monarch butterfly stopovers.

Significant Landscapes

Significant landscapes are areas that are uniquely managed and that may affect adjacent private landowners or that may particularly influence wildfire management actions within the planning area.

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Kirtland's Warbler Management Areas

Kirtland's warbler historically required wildland fire to maintain habitat conditions for breeding. Wildland fire suppression led to declines in Kirtland's warbler habitat and populations, eventually leading to its designation as federally endangered. Today, Kirtland's warbler populations have rebounded because of management of habitat through the use of mechanical and prescribed fire techniques.

Kirtland's warbler typically occupy jack pine stands greater than 80 acres, 6-16 years of age, with a stocking density of 1,089 or more trees per acre, and scattered small openings. Stands of 1,000 acres and larger have been found to improve nesting density and duration of stand use.

On the Hiawatha National Forest, areas managed for Kirtland's warbler are generally restricted to Management Areas (MAs) 4.4 and 4.2 where suitable breeding habitat is found (See HNF Forest Management Plan 2006 Ch. 3). The areas include a variety of forest types and are currently growing approximately 40,300 acres of jack pine and are the most likely areas for Kirtland's warbler occupancy.

Immediately after a mechanical cut or thinning of jack pine stands in Kirtland's warbler management units, wildfire risk may be reduced because of a reduction of flammable fuels. As the jack pine stands grow into dense, young stands, wildfire risk can be extremely high. Anyone living near jack pine stands in Kirtland's warbler management units should be aware of the potentially increased risks, and work with their local VFD or USFS fire professionals to create defensible space around their homes through vegetative fuel reduction and other mitigation actions.

Candidate and Research Natural Areas

Research Natural Areas (RNA) are part of national network of ecological areas that consist of relatively pristine representatives of a variety of habitats. RNA's are preserved and maintained for ecological research, observation, genetic conservation, monitoring and educational activities and serve as a reference to similar habitats with more diverse management activities.

RNA's show little human disturbance and are managed to allow natural ecological process and disturbances such as wildland fire, beaver flooding, tree throw to shape the landscape. Prescribed fire and use of wildland fire should be used where it is a natural part of the system and restores or maintains the RNA values. Fire suppression tactics should protect the unique RNA values. Candidate Research Natural Areas may be established as RNA's.

Designated Wild and Scenic River Corridors

The Sturgeon and the Whitefish Designated Wild and Scenic Rivers are found within the planning area. Wild and scenic river corridors are managed to protect and perpetuate wild and scenic river values while allowing the use and enjoyment of these rivers for current and future generations. Prescribed fire should be used where it is a natural part of the system and to simulate a natural disturbance process. Fire suppression tactics should protect and maintain the values of the river corridors with minimal impact.

Martin Bay Nature Sanctuary

The Martin Bay Nature Sanctuary, owned by the Michigan Nature Association (MNA) in Bay De Noc Township, is a 34 acre sanctuary along the lakeshore of Lake Michigan which is bisected by Martin Creek. The mouth of the Martin Creek forms a freshwater estuary making the site significant along the Lake Michigan coastline and supporting a unique diversity of flora and fauna. Natural community types found within the

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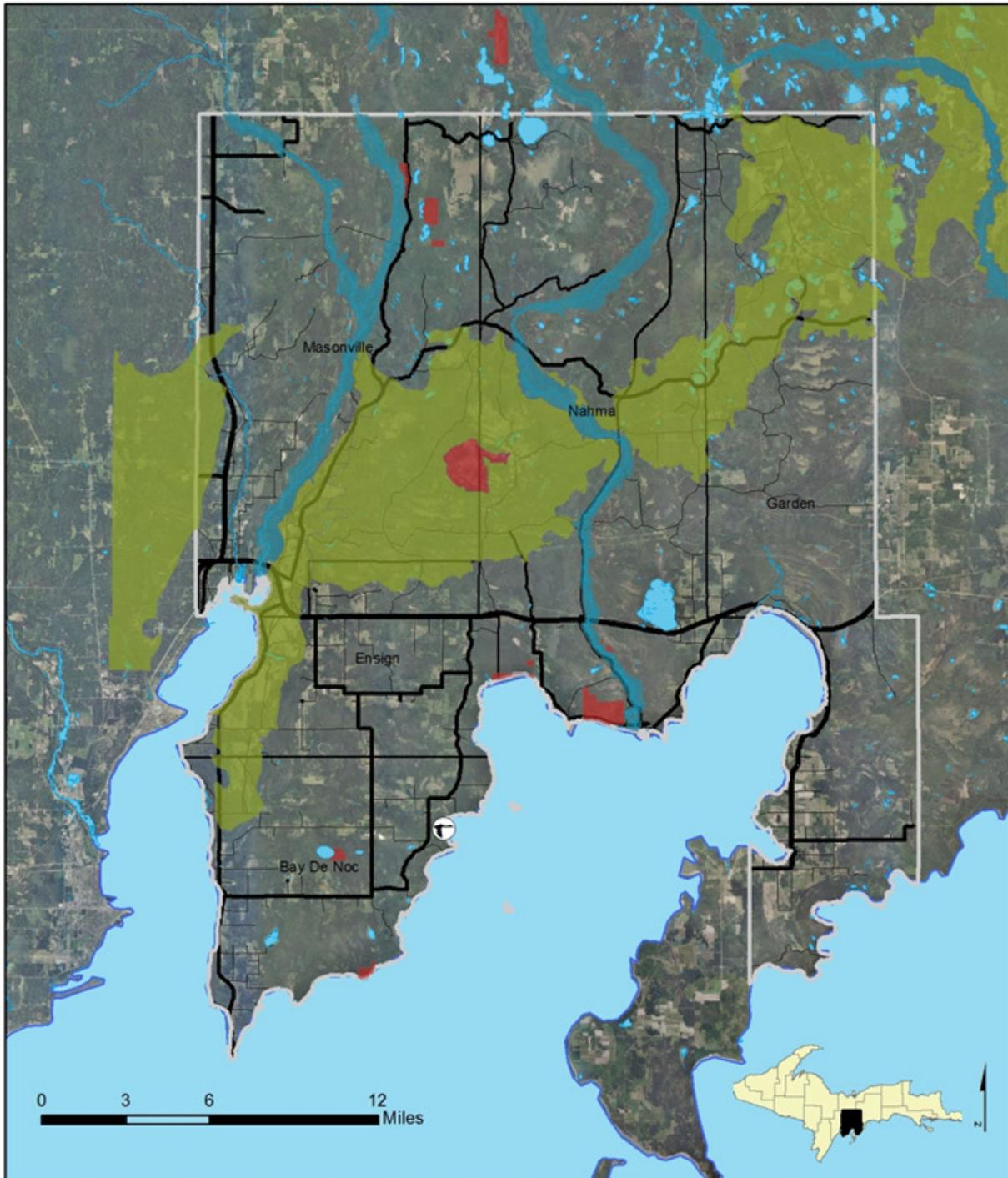
sanctuary include great lakes marsh and mixed conifer swamp. The Martin Bay Nature Sanctuary would typically not be considered a fire dependant community and would not carry wildfire under most typical conditions. In the event that a wildfire did threaten to burn through the sanctuary, MNA would desire to have no fire suppression activities occur within the boundaries of the sanctuary as the use or presence of numerous personnel, equipment, fire line installation, or fire retardant drops etc. may be more damaging to the natural features of the sanctuary than allowing the sanctuary to burn.

Significant Landscapes



Eastern Delta County
Community Wildfire Protection Plan

- Planning Area Townships
- Significant Landscapes**
 - Kirtland Warbler Management Areas
 - Candidate and Research Natural Areas
 - Designated Wild and Scenic Rivers
- Martin Bay Sanctuary - Michigan Nature Association
- Highways
- County Roads
- Federal Forest Roads
- Local Access Roads



Eastern Delta County Community Wildfire Protection Plan

Significant Pests

Native and non-native pests are a reality in forested areas and can be very localized or spread over a large area of a landscape. Many pests play an important ecological role in forests such as killing trees which in turn become valuable homes or food sources for certain species such as woodpeckers. But some pests, especially non-native pests, can cause extreme damage to forests over large areas and can even nearly exterminate species.

Pests can cause great economic harm to wood that was planned to be harvested, but pests can also increase the risk of extreme and catastrophic wildfire by killing large areas of trees; in effect creating plentiful dry fuel for wildfire. Areas with recent insect infestations accompanied by high tree mortality are ideal candidates for fuel reduction in WUI areas. (See HNF Forest Plan 2006-3400 Forest Pest Management-Pg. 2-22). Below are some common forest pests.

Jack Pine Budworm

Jack pine budworm is a native, needle feeding caterpillar and the primary insect defoliator of jack pine. It results in top kill or tree mortality, and most often affects stands older than 45 years that grow on very sandy sites and are stressed by drought or other factors. Ecologically, the bud worm has played an important role in creating the dry fuels (dead jack pine) for wildland fire which promotes regeneration of jack pine. The Stonington peninsula area has experienced a substantial amount of jack pine mortality from budworm in the recent past, and the USFS has completed fuel reductions in some of these areas.

Beech Bark Disease

Beech bark disease is widespread in the planning area is causing mortality of most American beech trees. It is caused by the small, non-native beech scale insect that compromises the bark of the tree, which is then invaded by a fungus which eventually kills the tree. Hiawatha National Forest is currently putting substantial effort into mitigating the hazard of dying and dead beech trees and garnering the economic value of the trees through tree harvesting.

Eastern Spruce Budworm

The spruce budworm is a very destructive native insect whose larva bores into and feeds on the needles and buds of trees in spruce and fir forests. Balsam fir is typically the most severely impacted by the budworm but other species such as white and black spruce, tamarack, and white pine and hemlock can also be affected. The trees are typically defoliated over several years which often lead to tree mortality.

Emerald Ash Borer

The ash borer is a non-native beetle. The larvae of the beetle feed on the inner bark of ash trees, disrupting the trees ability to transport water and nutrients and causing die back of the tree canopy and tree mortality. As of July 2011 there were known detections at the eastern end of Delta County in Garden and Nahma townships.

Forest Tent Caterpillar

The tent caterpillar is a native insect that favors aspen and oak (and sometimes other hardwoods) in the Great Lake States. The caterpillar can periodically defoliate trees over extensive areas and can sometimes lead to tree mortality, especially in aspen.

Gypsy Moth

The gypsy moth is a non-native insect. The caterpillar larva prefers feeding on the leaves of deciduous hardwoods, causing substantial defoliation and sometimes mortality.

IV. Wildland Fire Background

Wildland Fire Types

Wildland fire can be divided into two general categories – planned (eg. Prescribed Fire) and unplanned, known as wildfire. Wildfire is generally far more dangerous as it is unexpected and often occurs under extreme environmental conditions such as drought, making it difficult to control.

Wildland fire can be divided into several types based on where and how the fire burns in the landscape.

Ground Fire

Ground fires burn below the surface in the natural litter, duff, roots, buried logs, and other organic matter. These fires tend to smolder, can be difficult to detect and control, and often rekindle days or weeks after ignition.

Surface Fire

Surface fires burn grasses or shrubs up to 4 ft tall, lower tree branches, slash, logs, needles, leaves, and other understory vegetation above the ground surface. They can ignite and move rapidly, and tend to be of low intensity and are the most common in the forests of the planning area. Intermediate size trees, shrubs, and even branches can act as “ladder” fuels, carrying the surface fire rapidly into the crowns of trees.

Crown Fire

Crown fires burn in the canopy of trees and can be very intense, difficult to control and thus are the most dangerous type of wildfire. Tree mortality can be high. Crown fires are most commonly found in jack pine forests and other pine forests.

Spotting

During crown fires, large burning embers called firebrands can be aided by wind and topography ahead of the main fire, causing additional spot ignitions. Once spotting begins, the fire can be very difficult to control. Firebrands are one of the most common causes of ignition of homes and other structures.

Wildland Fire Benefits

While the primary concern of this plan is the protection of communities from severe and catastrophic wildfire, it is important to note there are many tangible benefits of wildland fire some of which are listed below:

- Healthy forests with less disease and increased timber value potential.
- Reduced community risk due to less flammable vegetative fuels and lower intensity and less severe wildfire.
- Opening maintenance in grasslands, wetlands and forests for wildlife game – deer, grouse, etc.
- Stimulates wild berry and morel mushroom growth.
- Intentional and prescribed ignition of croplands can increase soil fertility.

Fire Factors

There are three basic factors required to create and sustain fire. If any of these are exhausted, removed, or isolated the fire will be suppressed.

- Heat: Fire needs enough heat to sustain the process.
- Fuel: Fire needs a steady supply of fuel such as vegetation to burn. The drier the fuel the more likely it will burn.



Eastern Delta County Community Wildfire Protection Plan

- Oxygen: Fire needs oxygen to burn. Strong winds feed fire with oxygen, and can push the flames forward more rapidly.

Wildfire Susceptibility Factors

Understanding the primary factors that influence susceptibility to wildfire is important in identifying conditions that increase wildfire risk. Each factor by itself influences wildfire behavior, but as a combination, these factors can greatly magnify the susceptibility to wildfire and increase the rate of spread and severity of wildfire.

Fuels

Any living or dead vegetation that is potentially combustible is considered a fuel. There are two types of fuel: fine fuels and coarse fuels. Fine fuel types are easy to ignite, burn rapidly, produce large flames, and include dried grasses, leaves, pine needles, and twigs less than $\frac{1}{4}$ in diameter. Coarse fuel types include tree trunks, logs, limbs, and duff that ignite more slowly, but burn longer when ignited with small flames or smoldering.

Dead or dormant vegetation tends to be the most combustible. In the Upper Peninsula, fires most commonly occur during the spring after the snow has melted, and before the dormant “brown” vegetation has had the opportunity to “green up”. The most flammable fuels in the planning area are the conifers, especially jack pine and red pine. The hardwoods are much less flammable. Homes and other structures can also be combustible fuels.

Topography

Topography can influence wildfire. When fire moves upslope, the heat from the fire rises and preheats the vegetation causing easy and potentially rapid ignition. Fires burning on flat or gently sloping areas tend to burn slower and in a wider ellipse than fires on steeper slopes. Slopes are minimal in the planning area but even on minimal slopes fire moves more quickly as it preheats the vegetation upslope. Fire hazard is typically greater on south or southwest aspect slopes because of longer and more intense sunlight which typically dries fuels.

Weather

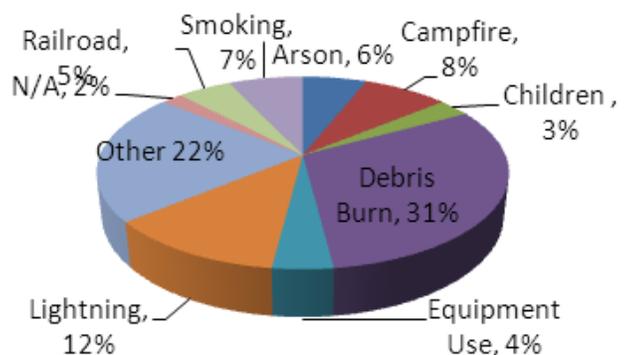
Weather contributes significantly to the susceptibility of forests to wildfire. Weather includes precipitation, temperature, relative humidity, and wind. Droughts can affect the moisture content of fuels by drying them out and combined with low relative humidity, increases the chance that fuels will ignite. Hot temperatures can dry and preheat fuels. When strong winds are added to the other high risk weather conditions, there is a very high risk of wildfire. Wind dries fuels and increases oxygen supply, as well as influencing the direction of the wildfire and the rate of spread.

Wildfire in Michigan

Wildfire is caused either by natural events such as lightning or by humans intentionally or through human carelessness. An estimated one-third to one-half of all Michigan wildfires are caused by debris burning of yard waste and garbage. In 2010, only 7% of Michigan wildfires were caused naturally by lightning strikes, while 28% were human caused via debris burning.

In the Upper Peninsula in 2010, 112 wildfires burned 533 acres with 68% of them caused by human carelessness.

Wildfire Causes in the Planning Area 1982-2010

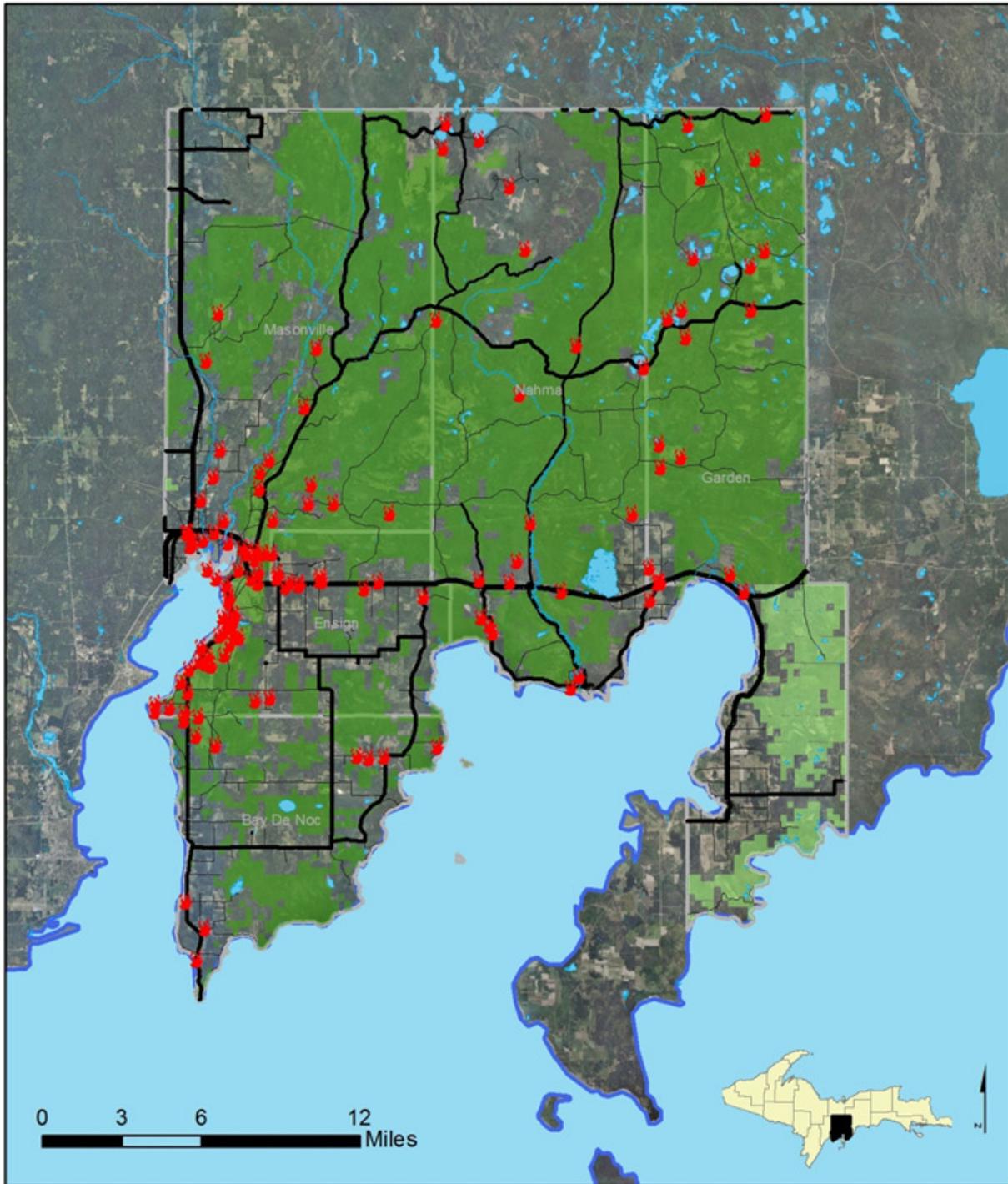


Historical Wildfire Occurrences 1982-2010



Eastern Delta County
Community Wildfire Protection Plan

- Planning Area Townships
- Wildfire
- Highways
- County Roads
- Federal Forest Roads
- Local Access Roads
- Public Land
 - Hiawatha National Forest
 - Michigan DNR



Eastern Delta County Community Wildfire Protection Plan

Wildfire in the Planning Area of Eastern Delta County

A review of wildfire causes from Hiawatha National Forest data reveals that of 130 wildfires between 1982 and 2010, 88% were caused by human activity. Debris burning was most often cited as the cause at 31%. Many wildfires could be eliminated by more careful human behavior, thus reducing overall wildfire risk in the planning area communities.

Fire Regime and Condition Class

Wildland fire has shaped natural landscapes for millennia. Periodic wildland fire historically selected for specific vegetation and wildlife characteristics, recycled nutrients, and provided a mosaic of vegetation types and growth stages throughout the landscape. The frequency, size and severity of natural wildland fire varied across the landscape, but there were some general patterns of fire behavior that developed in various landscapes based on vegetation types, weather and climate, and other factors.

We used LANDFIRE's Fire Regime Group data to map historic fire regimes and Fire Regime Condition Class data to map vegetation conditions across the landscape.

Note: The classifications and data used in the following 3 maps were compiled and analyzed by LANDFIRE. LANDFIRE is a shared effort between the U.S. Department of Agriculture USFS and the U.S. Department of the Interior. The Nature Conservancy's LANDFIRE team works in partnership with federal, state, private and cooperative partners in developing and using LANDFIRE data, tools and products. www.landfire.gov.

Fire Regime Groups (see map, page 28) are intended to characterize the presumed historical fire regimes within landscapes based on interactions between dynamics, fire, spread, fire effects, and spatial context.

- Fire Regime Group I (0 to 35 year frequency, low to mixed severity)
- Fire Regime Group II (0 to 35 year frequency, replacement severity)
- Fire Regime Group III (35 to 200 year frequency, low to mixed severity)
- Fire Regime Group IV (35 to 200 year frequency, replacement severity)
- Fire Regime Group V (200+ year frequency, any severity)

Fire Regime Condition Class (see map, page 29) is a discrete metric that quantifies the amount that current vegetation has departed from the simulated historical vegetation reference conditions possibly resulting in changes to key ecosystem components such as vegetation characteristics (species composition, structural stage, stand age, canopy closure, and mosaic pattern), fuel composition, fire frequency, severity, and pattern and other associated disturbances such as insect and disease mortality, grazing and drought. Possible causes of departure (but are not limited to) fire suppression (lack of fire), timber harvesting, livestock grazing, introduction of exotic plant species, and introduced insects and disease.

The three condition classes describe low departure (FRCC 1), moderate departure (FRCC 2), and high departure (FRCC 3).

The spatial combination of Fire Regime Groups I & II, and Fire Regime Condition Class III (see map, page 30) represents areas with frequent (0-35 year) historical fire regimes, together with high ecosystem departure. This information can be useful for broadly identifying some of the areas that would most benefit from prescribed burning or mechanical fuels treatments and hence returning forests to a more natural and healthy forest condition. Often, this combination represents situations where conifer forests have an over representation of closed

Eastern Delta County Community Wildfire Protection Plan

LANDFIRE Historical Fire Regimes

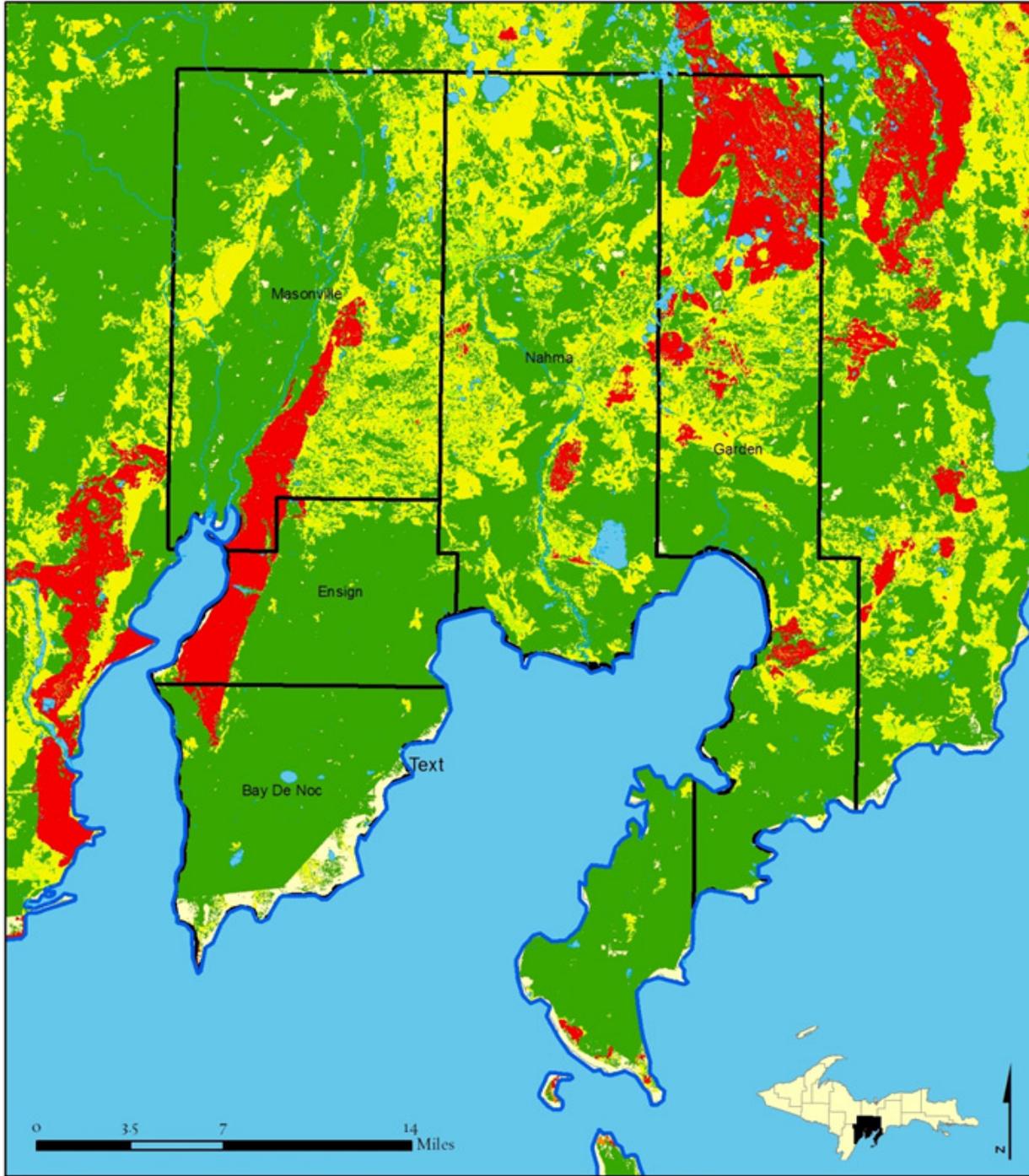


Eastern Delta County
Community Wildfire Protection Plan

CWPP Townships
 Water Features

- Fire Regime Group I (0-35 year frequency, low to mixed severity)
- Fire Regime Group II (0-35 year frequency, replacement severity)
- Fire Regime Group III (35-200 year frequency, low to mixed severity)
- Fire Regime Group IV (35-200 year frequency, replacement severity)
- Fire Regime Group V (200+ year frequency, any severity)

* Tan Areas Lack Data



Eastern Delta County Community Wildfire Protection Plan

LANDFIRE Fire Regime Condition Class

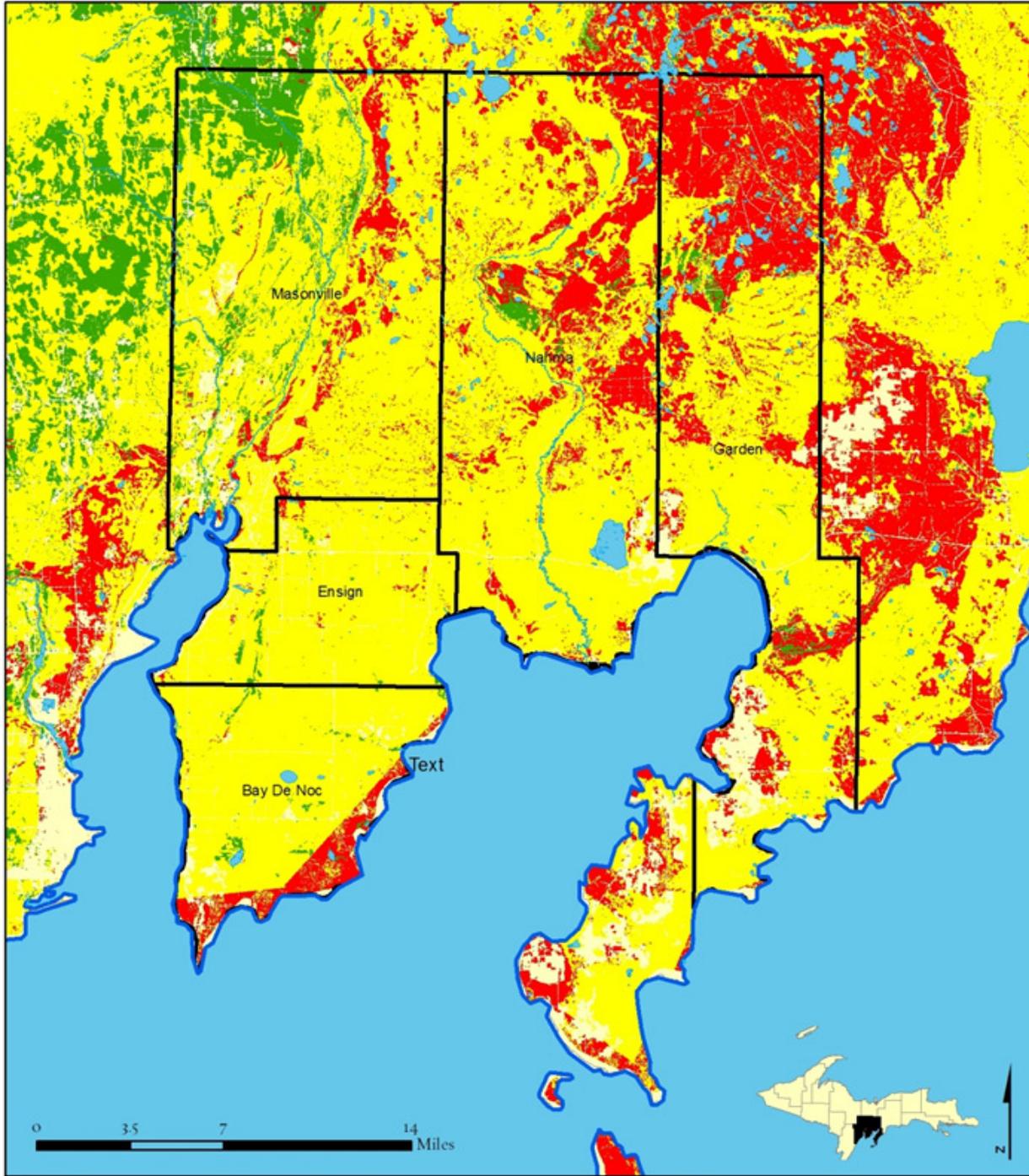


CWPP Townships
 Water Features

FRCC I - Ecosystems with Low Departure (<33%)
 FRCC II - Ecosystems with Moderate Departure (33-66%)
 FRCC III - Ecosystems with High Departure (>66%)

Eastern Delta County
Community Wildfire Protection Plan

* Tan Areas Lack Data



Eastern Delta County Community Wildfire Protection Plan

LANDFIRE Fire Regime Groups I & II, and Fire Regime Condition Class III

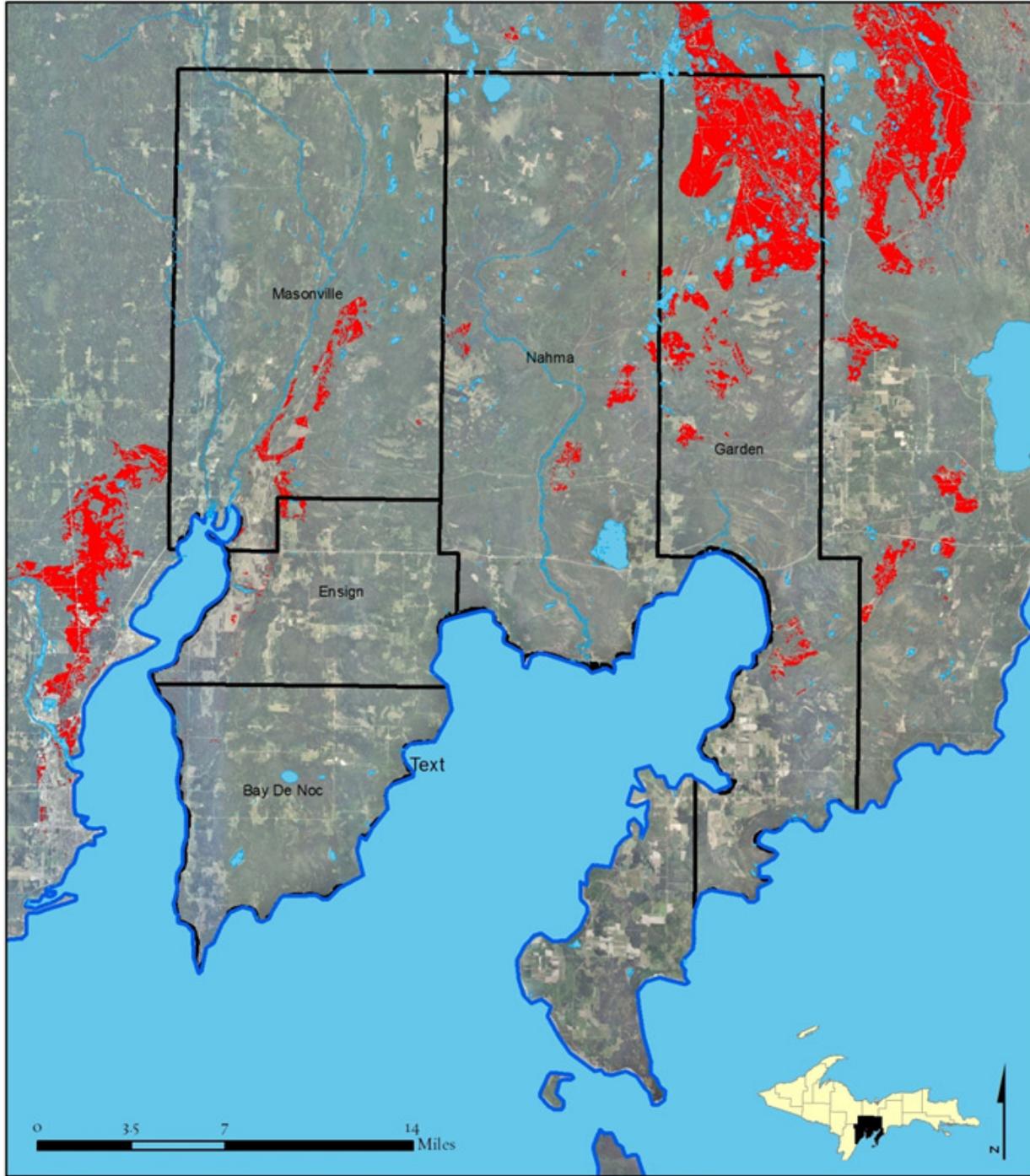


Eastern Delta County
Community Wildfire Protection Plan

 CWPP Townships

 Fire Regime Groups I & II, and FRCC III

 Water Features



Eastern Delta County Community Wildfire Protection Plan

canopy conditions and therefore a higher risk of replacement fires and/or tree stress. It is possible however, that FRCC III in these systems could be due to replacement of conifer species with deciduous species such as red maple which can dramatically change the ecological functioning of a site and reduce the probability of fire. *On the ground site visits should always be completed before making final management decisions.*

In general, conditions for both federal and non-federal forests should be managed to move as much as possible towards Fire Regime Condition Class 1 in which the forest system is within its natural fire range and at low risk for losing ecosystem components from wildfire. Due to on the ground limitations such as the need to protect human life, property, and valuable natural resources, it may not be possible, or desirable to fully achieve a Condition Class 1 in many areas. Some federal areas with the greatest potential to be managed towards Condition 1 are wilderness areas, research natural areas, and candidate research natural areas.

Fire-Dependent Ecosystem Communities

Wildland fire is an essential natural process in fire-dependent ecosystems. These ecosystems are resilient over time to repeated fire. Many plants and animals have evolved to tolerate the periodic sweep of flames, and their reproduction, growth and survival depend on and often thrive on fire effects. Fire continually sets into motion biotic cycling, releasing minerals and nutrients, recycling stems, foliage, bark, and wood of plants, stimulating flowering and fruiting of many plants, triggering the release of seeds, and determining wildlife habitat patterns and populations through the mosaic of habitat created and maintained by periodic fire.

About one-third of the Hiawatha National Forest is fire-dependent ecosystems. Examples of fire-dependent ecosystems in the Upper Peninsula of Michigan include the oak savannas and barrens, and jack/red pine forests and barrens.

In the early 1800s, about 2.7 million acres of fire-dependent ecosystems occurred in Michigan. At least one-third of native Michigan plant species are known to occur within Michigan's fire-dependent ecosystems, with about 25% of these plant species potentially at risk of becoming extinct.

Hiawatha National Forest has mapped units of land with similar physical and biological characteristics at a broad scale into Ecological Landtypes (ELT). The following ELT's were identified as fire-dependent in the Hiawatha National Forest Final Environmental Impact Statement for the 2006 Land and Resource Management Plan.

ELT	Description
10/20	Red, jack, and white pine (all seral stages)
60	Early-seral jack pine, mid-seral balsam, spruce and red pine, and late-seral white pine, hemlock, and black spruce
70A/80A	Mid-seral balsam fir, black spruce, cedar and white pine, and late-seral black spruce, cedar, white pine and hemlock. (if surrounded by fire prone vegetation such as jack and red pine)

Eastern Delta County Community Wildfire Protection Plan



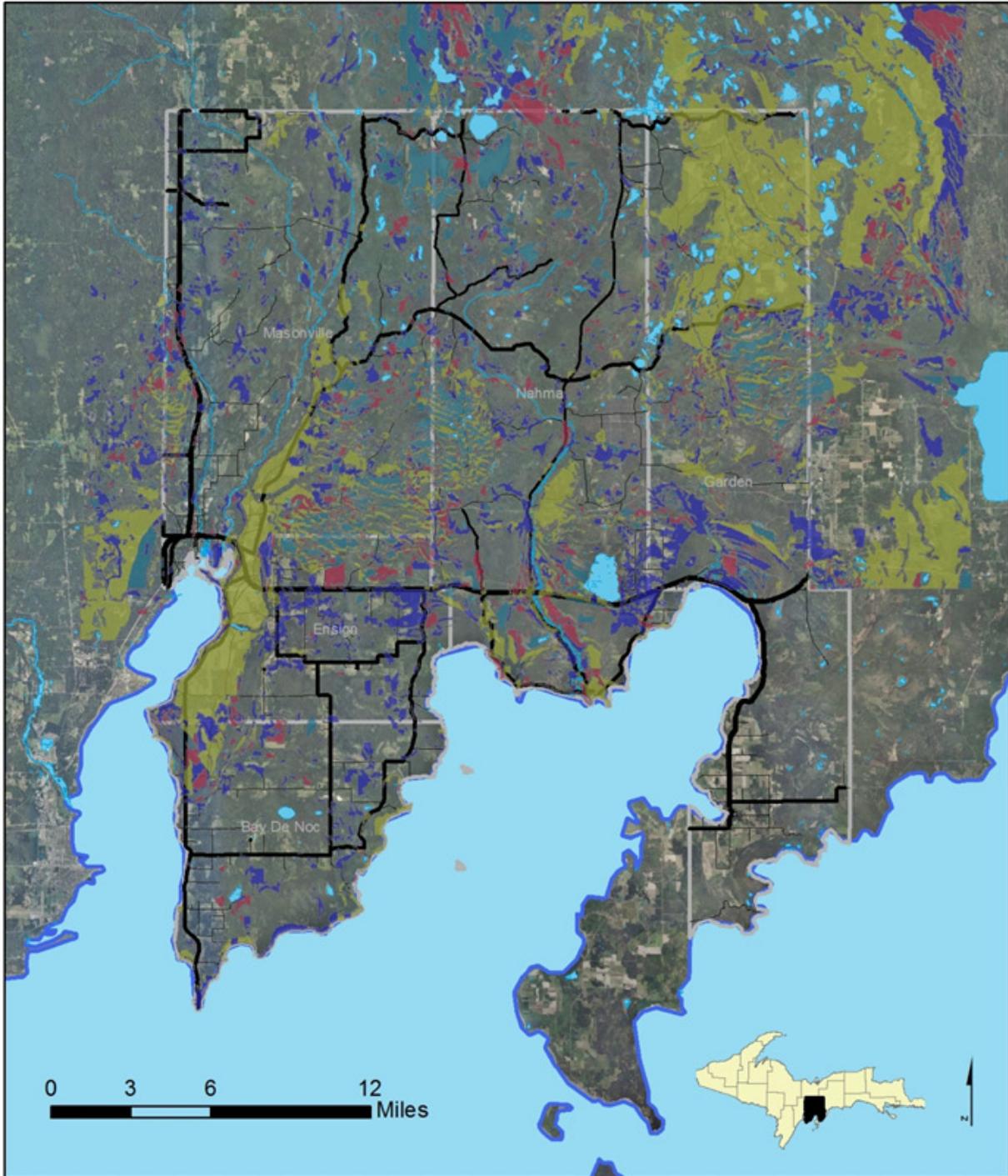
Eastern Delta County
Community Wildfire Protection Plan

Fire Dependent Ecological Landtypes

- Planning Area Townships
- Highways
- County Roads
- Federal Forest Roads
- Local Access Roads

Ecological Landtypes

- 10,20
- 60
- 70A
- 80A



V. Wildfire Risk Assessment: Identifying and Evaluating Wildfire Risk

Purpose

Periodic wildland fire is a vital and natural part of many healthy forest systems, but wildfire can be a threat to WUI communities who are not prepared to coexist with fire. Wildland fire will eventually happen but the location and timing are unknown. While we do not know exactly where and when a wildfire might occur, we can predict with some confidence, the most likely areas for wildfire based on a variety of factors such as vegetation type. Once aware of these areas, planning can help reduce the potential dire consequences of the next wildfire.

The purpose of the wildfire risk assessment is to spatially identify wildfire risk levels within the CWPP planning area. By identifying high risk areas, communities will be better informed and prepared to take actions to reduce their risk from catastrophic wildfire through targeted mitigation actions such as:

- Fuels reduction and restoration projects
- Firewise education and outreach projects
- Fire preparedness and protection and improvements

Wildfire risks can never be totally eliminated, but they can be substantially reduced with proactive planning and action.

Methodology and Results

Five broad risk categories with related sub categories were identified, weighted and used in a spatial GIS analysis. The categories and sub categories were chosen and weighted based on input from the planning committee and a review of other CWPP methodologies. These categories and sub categories are intended to provide a spatial analysis that takes into account not just vegetative fuel risks, but multiple factors that can simultaneously contribute to wildfire risk to communities.

The results of the analysis are presented in a final overlay map that identifies wildfire risk on a scale from low to high. For the purposes of planning, both the moderate to high and high categories within the Wildland Urban Interface should be considered priority areas for wildfire mitigation activities.

This assessment utilized several inputs from multiple data sources including local knowledge. As such, the scale, precision, and accuracy of the input data ultimately determine the outputs. While every measure was taken to insure the best accuracy and precision in the data we used, The Nature Conservancy makes no claims, no representations or no warranties, expressed or implied, concerning validity, reliability or accuracy of the GIS data and the GIS Products furnished by the Eastern Delta County CWPP Wildfire Risk Assessment, including the implied validity. All datasets were created or converted to NAD 1983 UTM Zone 16N projection.

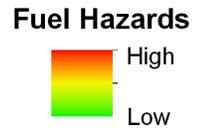
Eastern Delta County Community Wildfire Protection Plan

Category	Description	Weight (%)
Vegetation/Fuel Hazards	Vegetation that tends to burn more frequently and with greater severity	40
IFMAP Fuel Types	Land Use and cover type classification	80
Ecological Land Types	Fire Dependent Communities = High Risk; Others=Low Risk	20
Risk of Fire Occurrence	Areas that tend to have human ignitions	30
Structures	Structures including homes	40
Trails	Major trails systems	5
Wildfire Occurrences	Fires locations from 1982-2010	30
Roads	All roads	20
Recreation Sites	Known campgrounds, picnic areas, boat launches, trail-heads, and scenic rivers	5
Fire Preparedness	Preparedness and ease of suppression response and escape	10
Fire Stations	Proximity to fire stations	30
Water Sources	Proximity to water sources	30
Escape Routes-Access	Proximity to roads	20
Dead end roads-Access	Located on road with only one outlet	20
Infrastructure at Risk	Assets at risk of burning	15
Structures	All structures including homes	35
Utilities	Known electric substations & powerlines, gas lines & points, proposed wind turbines	10
Railroads	Rail lines	5
Sensitive Facilities	Fire stations, schools, township halls, USFS office	30
Escape Route	State roads	20
Other Community Values at Risk	Other assets and values at risk of burning	5
Conservation Lands	Owners from Conservation and Recreation Lands database	40
Recreation and Scenic Areas	Known campgrounds, picnic areas, boat launches, trail-heads, and scenic rivers	40
Significant Ecological Areas	Natural research areas, candidate research areas, scenic rivers, old growth areas	10
Shorelines	Shorelines of lakes & rivers	10

Eastern Delta County Community Wildfire Protection Plan

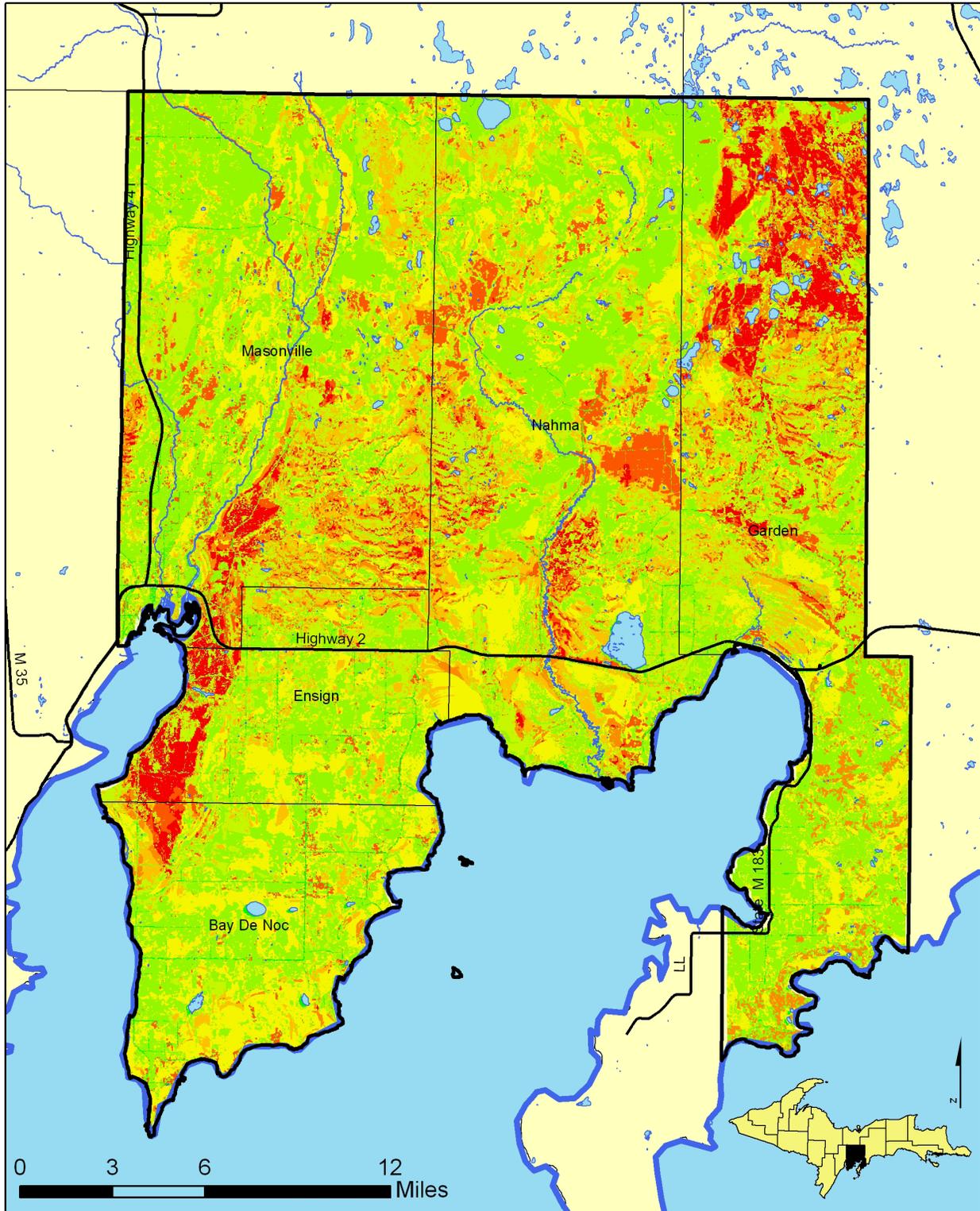


A. Fuel Hazards



□ Planning Area Townships

Eastern Delta County
Community Wildfire Protection Plan



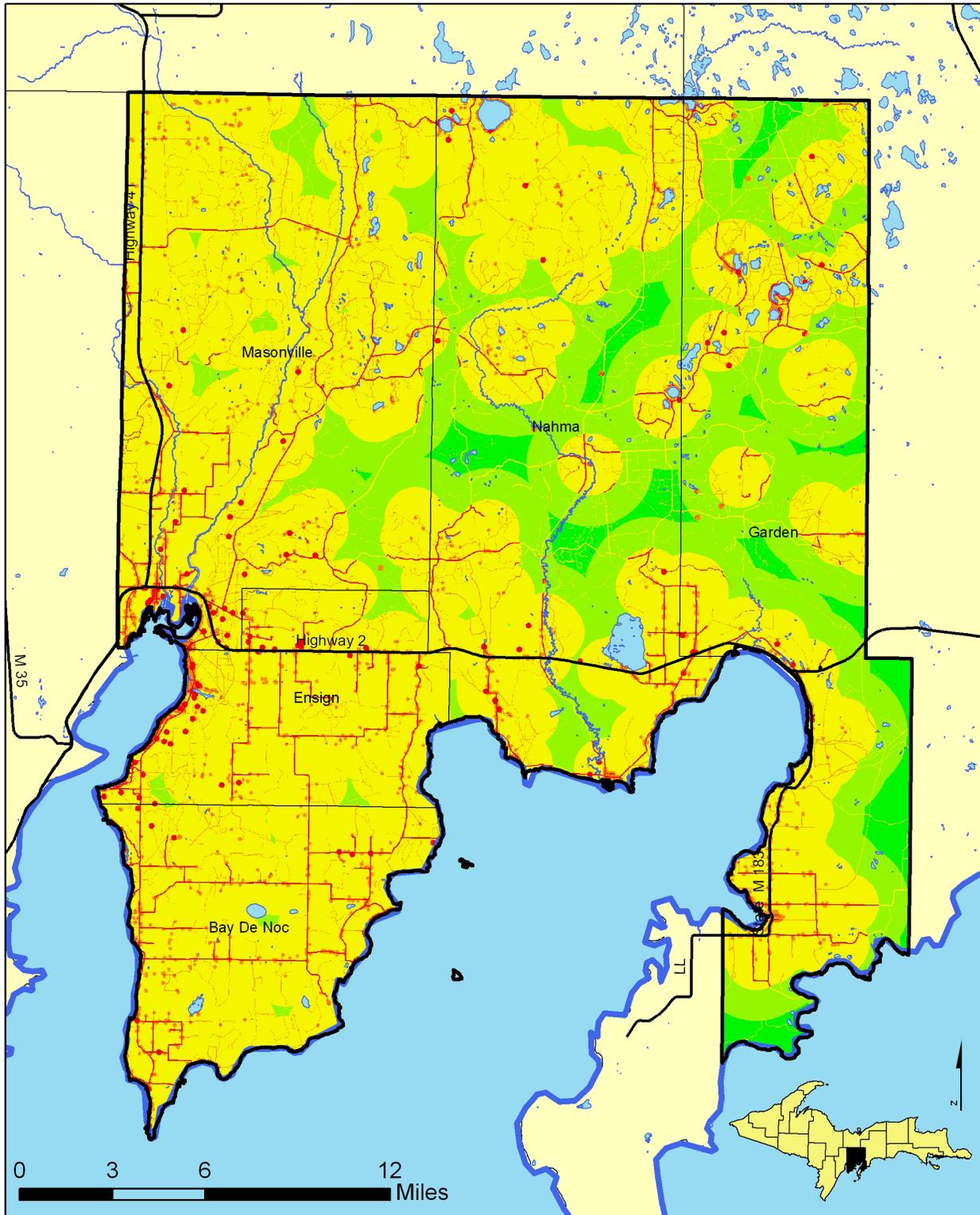
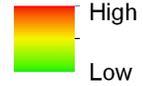
B. Risk of Wildfire Occurrence



Eastern Delta County
Community Wildfire Protection Plan

Planning Area Townships

Risk of Occurrence



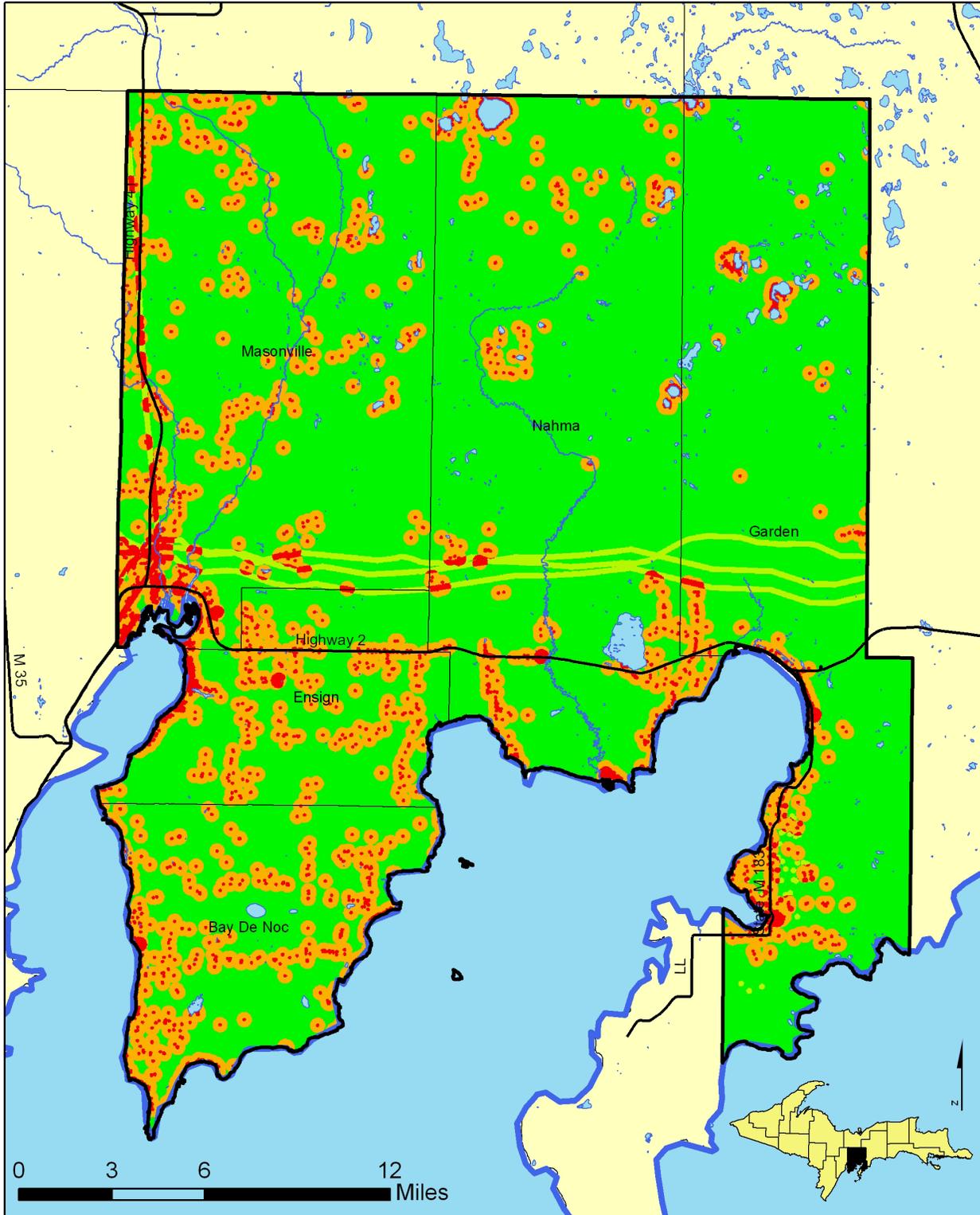
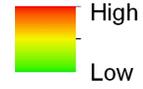
C. Infrastructure at Risk



Eastern Delta County
Community Wildfire Protection Plan

□ Planning Area Townships

Infrastructure at Risk



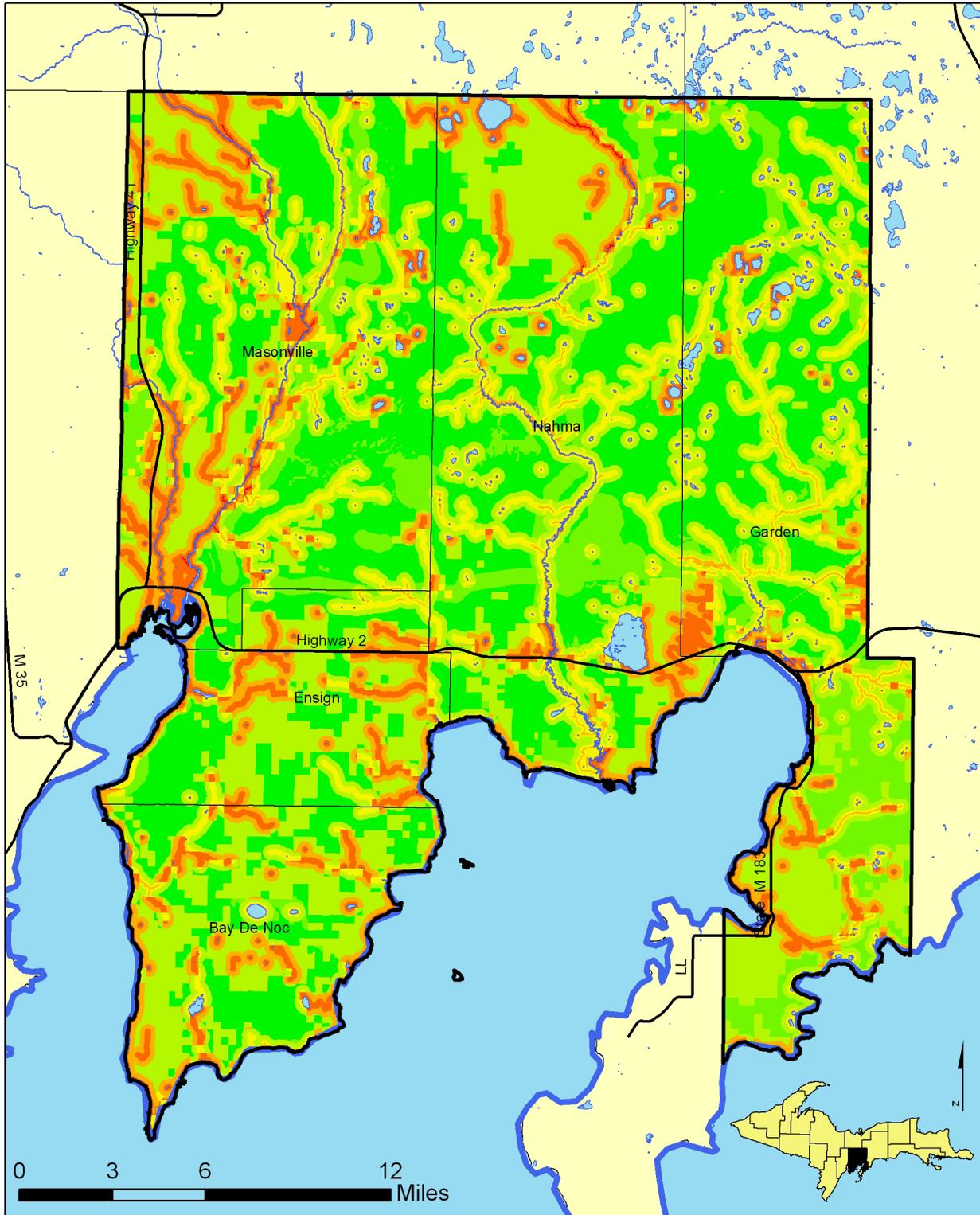
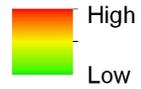
D. Other Community Values at Risk



Eastern Delta County
Community Wildfire Protection Plan

□ Planning Area Townships

Values at Risk

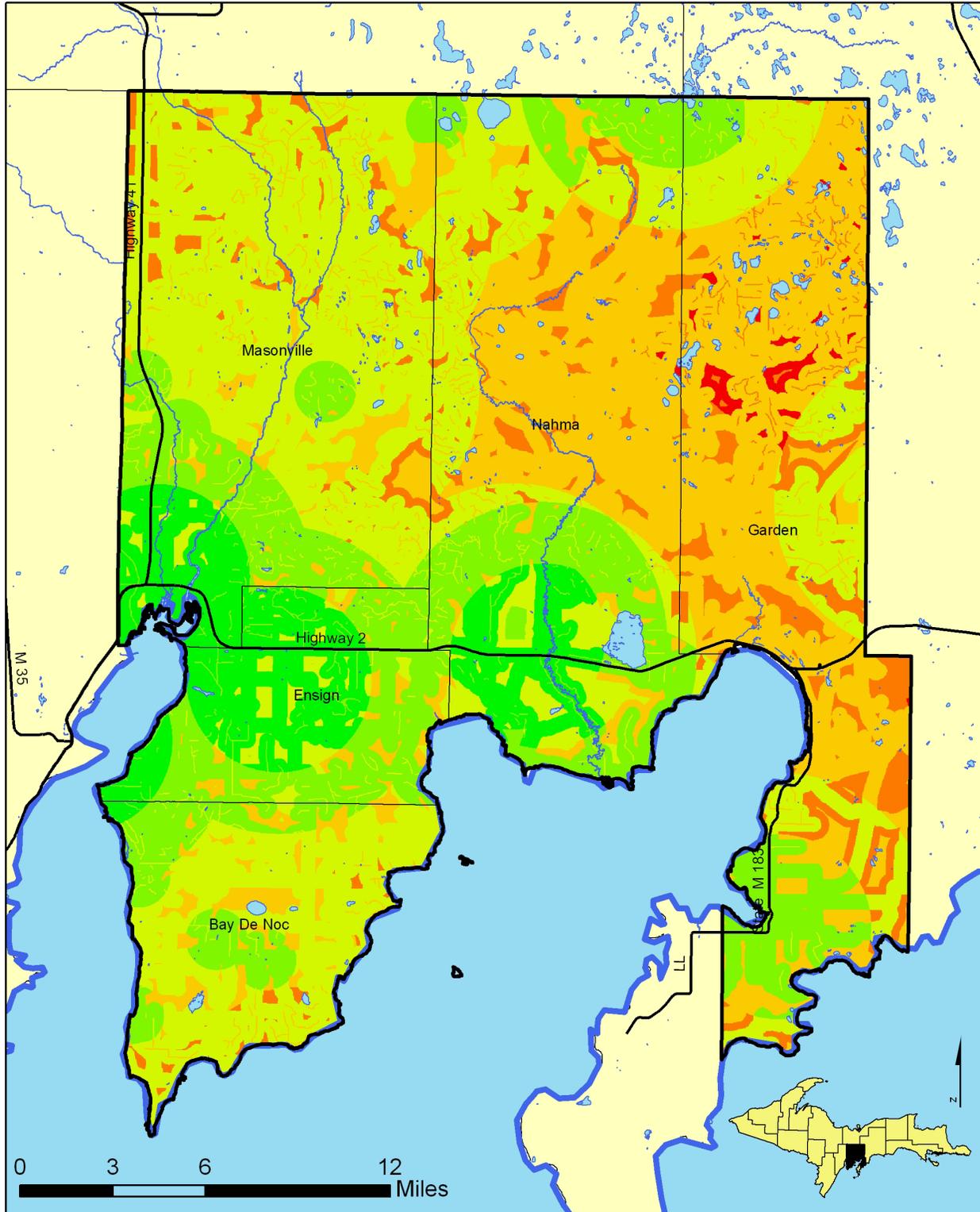
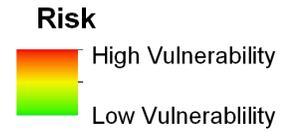


E. Local Preparedness and Protection Capability



Eastern Delta County
Community Wildfire Protection Plan

□ Planning Area Townships



Final Overall Risk

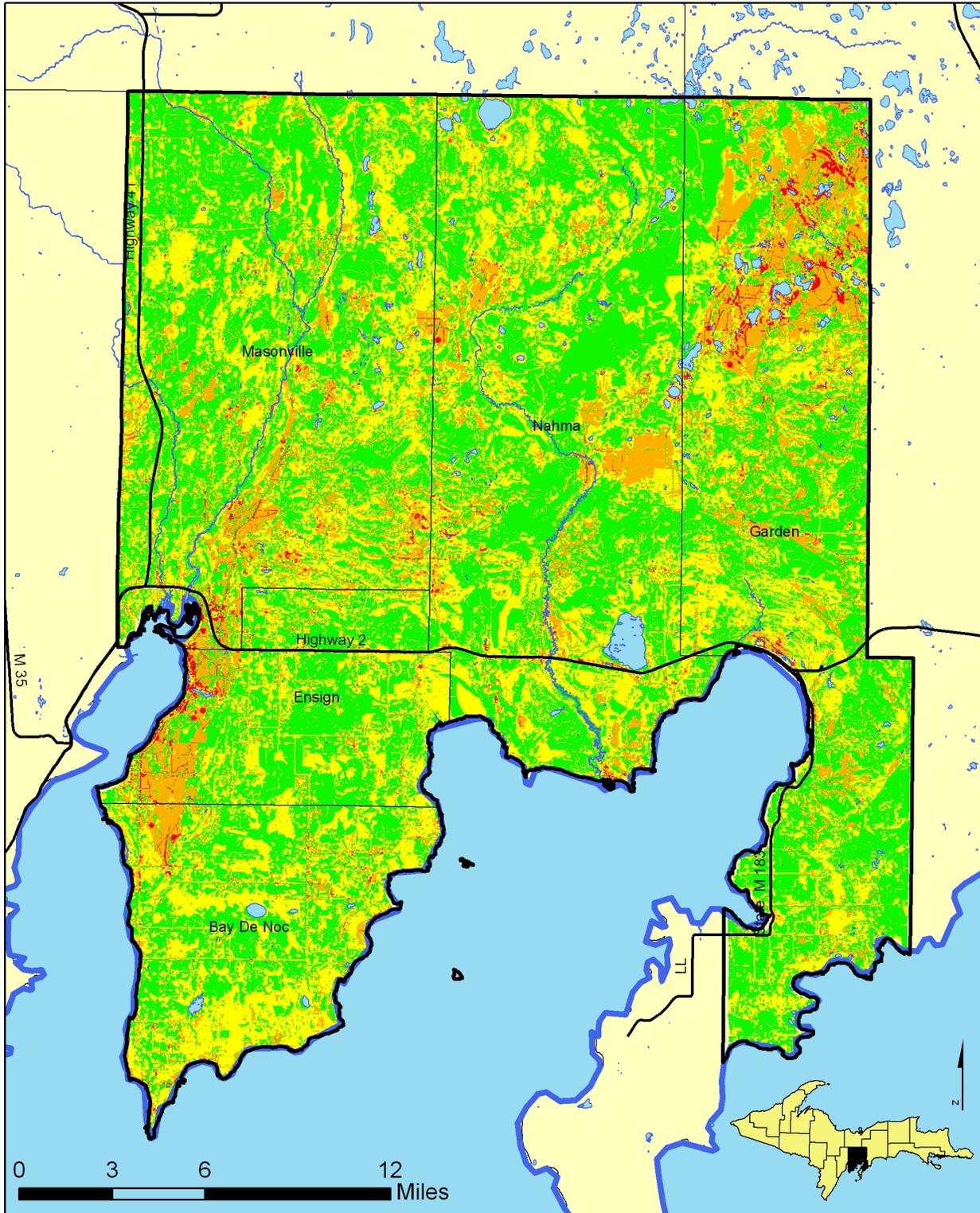


Eastern Delta County
Community Wildfire Protection Plan

□ Planning Area Townships

Overall Risk

- Low
- Low to Moderate
- Moderate to High
- High



VI. Wildland Urban Interface

Federal Definition

The initial definition of urban wildland interface and the descriptive categories used in this notice, Urban Wildland Interface Communities Within the Vicinity of Federal Lands that are at High Risk from Wildfire are modified from “A Report to the Council of Western State Foresters—Fire in the West—The Wildland/Urban Interface Fire Problem” dated September 18, 2000. Under this definition, “the urban wildland interface community exists where humans and their development meet or intermix with wildland fuel.” There are three categories of communities that meet this description. Generally, the Federal agencies will focus on communities that are described under categories 1 and 2. For purposes of applying these categories and the subsequent criteria for evaluating risk to individual communities, a structure is understood to be either a residence or a business facility, including Federal, State, and local government facilities. Structures do not include small improvements such as fences and wildlife watering devices.

Category 1. Interface Community

Structures directly abut wildland fuels with a clear line of demarcation between residential, business, and public structures and wildland fuels. Wildland fuels do not generally continue into the developed area. The development density for an interface community is usually 3 or more structures per acre, with shared municipal services. Fire protection is generally provided by a local government fire department with the responsibility to protect the structure from both an interior fire and an advancing wildland fire. An alternative definition of the interface community emphasizes a population density of 250 or more people per square mile.

Category 2. Intermix Community

Structures are scattered throughout a wildland area with no clear line of demarcation; wildland fuels are continuous outside of and within the developed area. The development density in the intermix ranges from structures very close together to one structure per 40 acres. Fire protection districts funded by various taxing authorities normally provide life and property fire protection and may also have wildland fire protection responsibilities. An alternative definition of intermix community emphasizes a population density of between 28-250 people per square mile.

Category 3. Occluded Community

Often within a city, structures abut an island of wildland fuels (e.g., park or open space) with a clear line of demarcation between structures and wildland fuels. The development density for an occluded community is usually similar to those found in the interface community, but the occluded area is usually less than 1,000 acres in size. Fire protection is normally provided by local government fire departments.

Local Definition

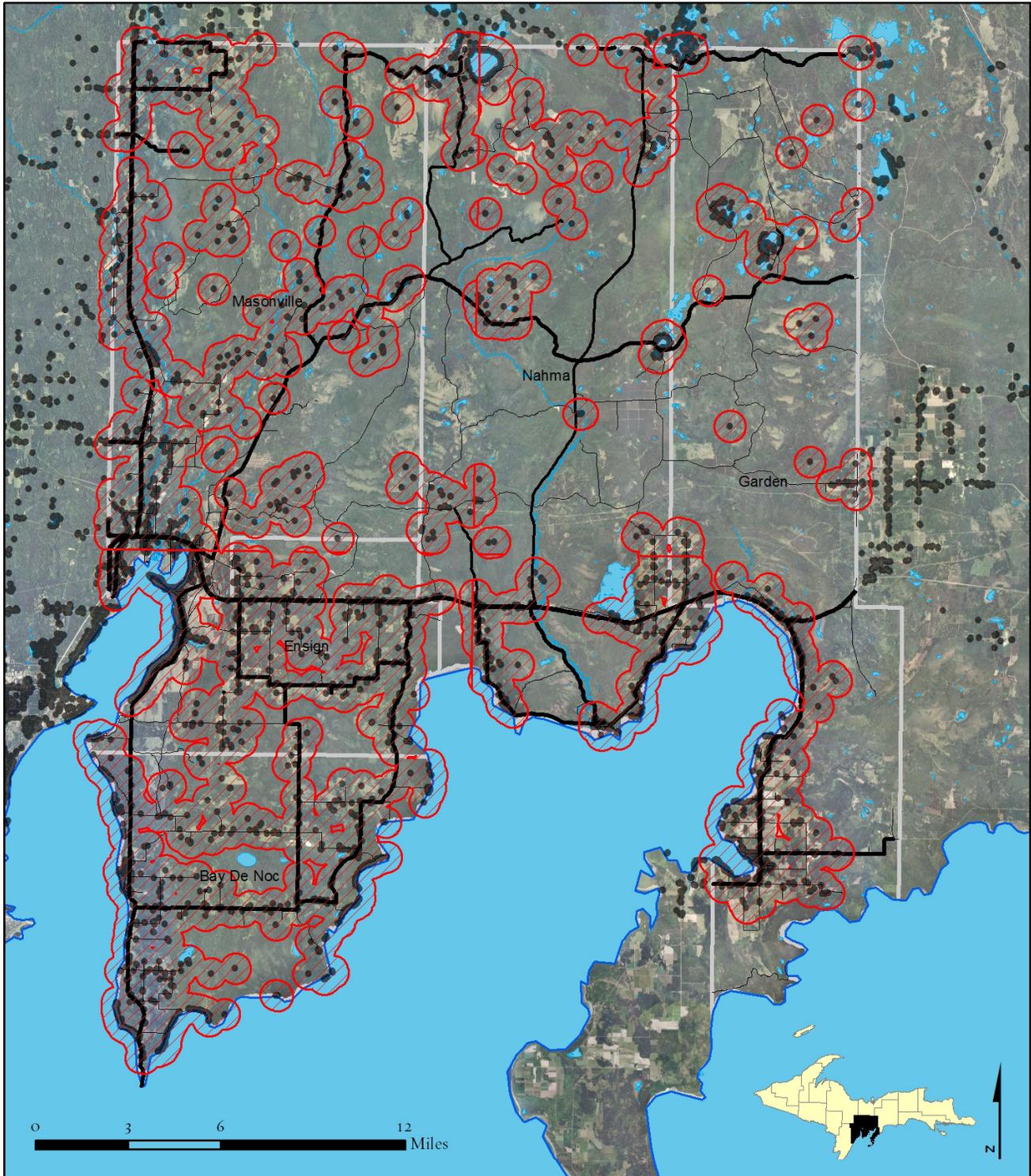
For the Eastern Delta County CWPP, the Wildland Urban Interface was determined to include any area within ½ mile of an existing structure. Due to the rural nature of the landscape, this covers approximately 50% of the planning area with much of the WUI composed of very low structure densities. Areas determined to be at moderate to high risk (orange to red) in the assessment and also within the ½ mile WUI should be the primary focus of mitigation actions. Research has shown that fuels reductions in areas up to 3-6 miles from the WUI can substantially reduce the likelihood of fire around WUI structures. Therefore, areas outside of the ½ mile WUI (and up to 3-6 miles from WUI boundary) or along roads and concurrently rated moderate to high risk (orange to red) should also be considered when vegetation is contiguous and local considerations suggest substantial risk reduction and ecological benefit from wildfire mitigation actions.

Wildland Urban Interface



Eastern Delta County
Community Wildfire Protection Plan

-  Planning Area Townships
-  Wildland Urban Interface 1/2 mile
-  Structures
-  Highways
-  County Roads
-  Federal Forest Roads
-  Local Access Roads



Wildland Urban Interface with Overall Risk

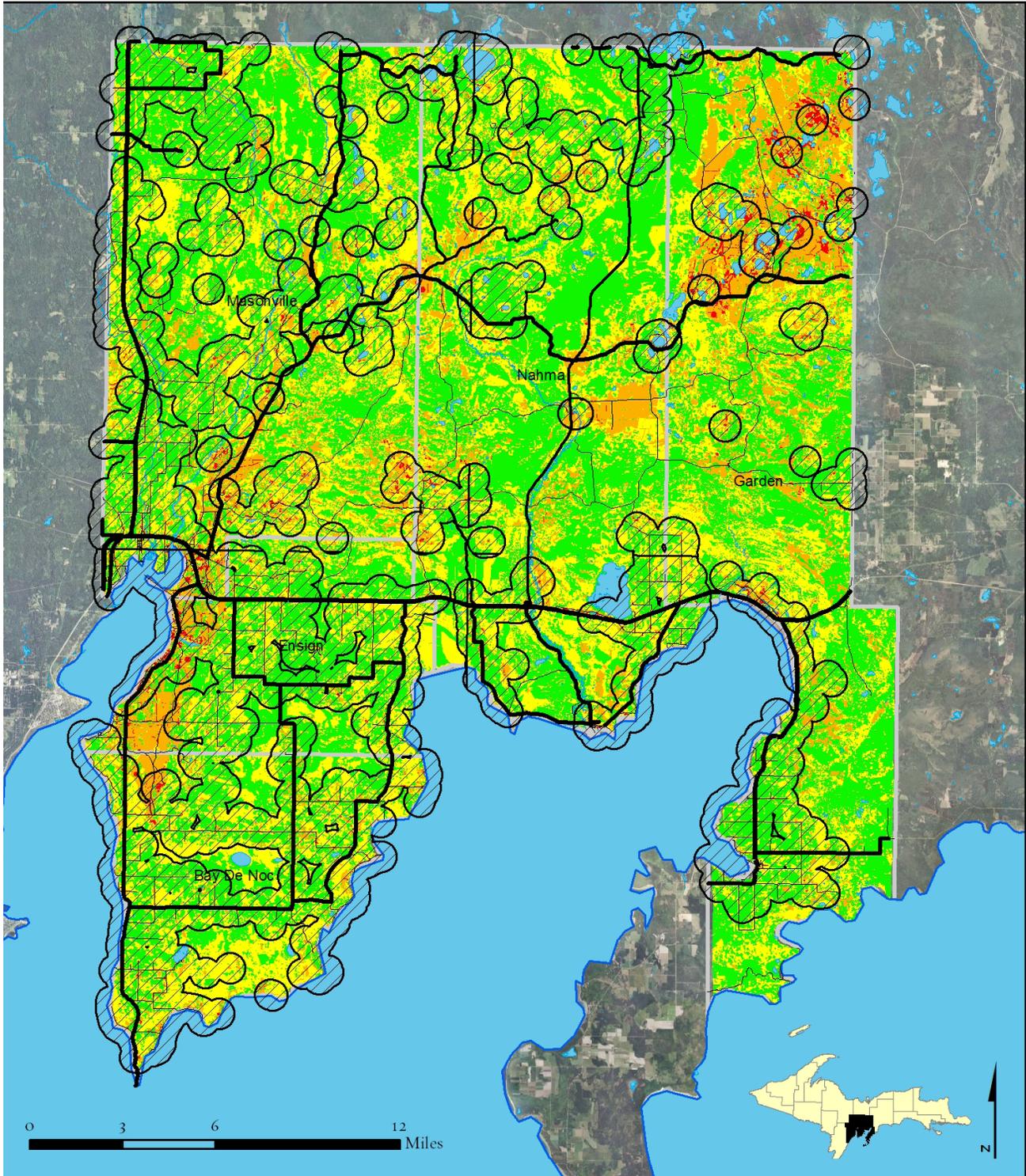


Eastern Delta County
Community Wildfire Protection Plan

- Planning Area Townships
- Wildland Urban Interface 1/2 mile

- Highways
- County Roads
- Federal Forest Roads
- Local Access Roads

- Overall Risk**
- Low
 - Low to Moderate
 - Moderate to High
 - High



VII. Fire Management

Fire management is the range of decisions and actions directed toward preventing, detecting, controlling, containing, manipulating, or using fire in a given landscape to meet specific goals and objectives.

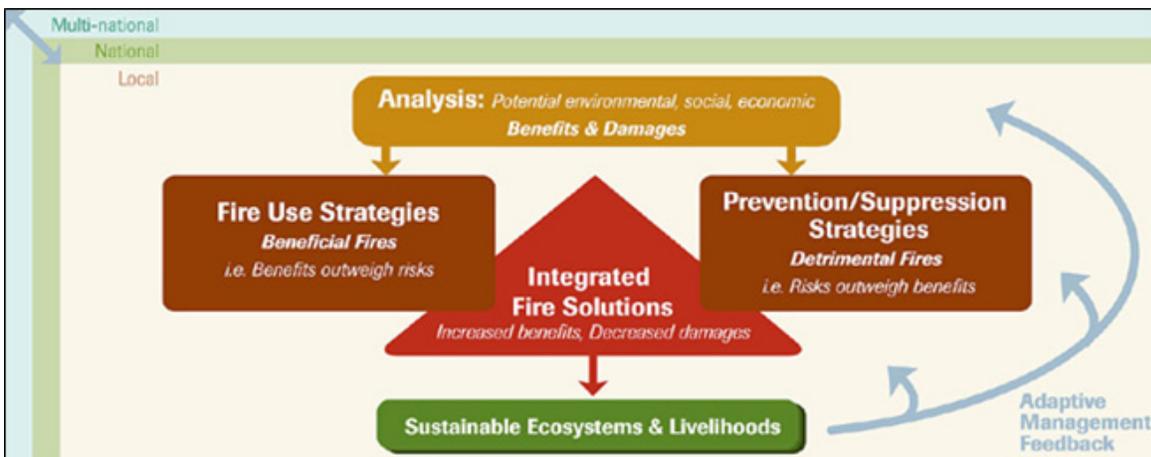
Integrated Fire Management

Daily fire management decisions and actions are knowingly and unknowingly being made as we live on the land and manage natural resources. Sometimes these decisions and actions are being made as if isolated from one another, when in reality decisions or actions today are intertwined and can have long lasting effects on wildfire behavior and consequences, ecosystem health, and socio-economic conditions. Integrated Fire Management can be a more holistic approach to fire management.

There are two aspects of fire – beneficial fire and detrimental fire. Beneficial fire maintains healthy fire-adapted ecosystems and is a useful human tool, while detrimental fire can damage fire-sensitive ecosystems and threaten human life and property. Fires can be both beneficial and detrimental depending how, when, and why they are burning. Decisions made while managing a fire can take advantage of benefits while minimizing damages.

Integrated Fire Management as defined by The Nature Conservancy, is an approach to addressing the problems and issues posed by both damaging and beneficial fires within the context of the natural environments and socio-economic systems in which they occur, by evaluating and balancing the relative risks posed by fire with the beneficial or necessary ecological and economic roles that it may play in a given landscape. It facilitates implementing cost-effective approaches to both preventing damaging fires and maintaining desirable fire regimes.

Integrated Fire Management integrates (1) fire management, prevention and suppression; (2) key ecological attributes of fire and; (3) the socio-economic and cultural necessities of using fire along with the negative impacts that fire can have on society.



National Cohesive Wildland Fire Management Strategy

In response to requirements of the Federal Land Assistance, Management, and Enhancement (FLAME) Act of 2009, the Wildland Fire Leadership Council (WFLC) directed the development of the National Cohesive Wildland Fire Management Strategy 2011 (Cohesive Strategy). The Cohesive Strategy is a collaborative process with active involvement of all levels of government and non-governmental organizations, as well as the public, to seek national, all-lands solutions to wildland fire management issues.

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Following is an excerpt from the Executive Summary of the Cohesive Strategy report:

“Addressing wildfire is not simply a fire management, fire operations, or wildland-urban interface problem — it is a larger, more complex land management and societal issue. The vision for the next century is to: Safely and effectively extinguish fire, when needed; use fire where allowable; manage our natural resources; and as a Nation, live with wildland fire.

Three primary factors have been identified as presenting the greatest challenges and the greatest opportunities for making a positive difference in addressing the wildland fire problems to achieve this vision. They are:

- Restoring and maintaining resilient landscapes. The strategy must recognize the current lack of ecosystem health and variability of this issue from geographic area to geographic area. Because landscape conditions and needs vary depending on local climate and fuel conditions, among other elements, the strategy will address landscapes on a regional and sub-regional scale.
- Creating fire-adapted communities. The strategy will offer options and opportunities to engage communities and work with them to become more resistant to wildfire threats.
- Responding to wildfires. This element considers the full spectrum of fire management activities and recognizes the differences in missions among local, state, tribal and Federal agencies. The strategy offers collaboratively developed methodologies to move forward.”

Township Fire Management

Township VFD’s focus primarily on fire suppression of structures, but frequently, respond first to wildfires because, in many cases, they arrive first on the scene. Each township fire department has its own fire management strategy.

Michigan Department of Natural Resources Fire Management

Michigan Department of Natural Resources seeks to reduce fuels, restore forests and prevent and suppress unwanted wildfires.

Excerpt from [State Forest Management Plan April 10, 2008 – Ch. 4.1.8](#)

See Appendix B for further reading.

Fuel Management

Desired future condition.—The state forest is managed to maintain fuel loads within the range of natural specific ecosystem variability in order to minimize adverse effect to ecological and socioeconomic values.

Goals:

1. Reduce excessive fuel loads outside of the natural range of variability for specific community types to reduce the hazard of catastrophic wildfires to forest resources and public and private facilities.
2. Work with other fire agencies and local units of government to encourage land owners and residents within the wildland-urban interface to reduce excessive fuel loads and to establish “defensible space” landscapes around structures.

Objectives:

1. Prescribe salvage cuts where appropriate to reduce fuel loads in areas with extensive mortality due to disease or insect infestations, while also considering the biodiversity values associated with snags and large woody debris.

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2. Reduce the potential for large crown fires in conifer species by reducing the occurrence of fuel ladders, excessive basal area, and inadequate crown spacing. The vegetation management program is the primary means by which this will be accomplished.
3. Identify “communities at risk” and “fire prone landscapes” as geographic areas of possible concern.

Guideline:

Through forest management prescriptions, strive to balance the retention of forest litter, large woody debris, and snags with a reduction of excessive fuel loads that can contribute to catastrophic stand fires, which result in the loss of biomass and the alteration of carbon balances.

Prescribed Fire

Desired future condition.—The state forest employs prescribed fire as a natural management tool, within the context of other ecological and socio-economic uses.

Goals:

1. Use prescribed fire as a natural tool for maintaining healthy conditions in fire-adapted ecosystems and landscapes.
2. Use prescribed fire to help maintain fuel breaks.

Objectives:

1. Prioritize all approved department prescribed burns by October 1st of each year.
2. Use prescribed burning in the forest stands to reduce competition for the growth of desired herbaceous and woody vegetation and for site preparation for forest regeneration.
3. Use prescribed burning in grassland areas to control encroachment by brush and trees.
4. Use prescribed burning in dedicated state Natural Areas and other areas of the state forest that contain communities where periodic fire is a natural ecologic process for the purpose of simulating natural conditions for the preservation or restoration of plant or wildlife species.
5. Use prescribed burning on other DNR-owned lands within the landscape (Parks and Wildlife divisions managed areas).
6. As determined by Operations Inventory/IFMAP prescriptions and within weather and budgetary constraints, attempt to conduct a minimum of 25 prescribed burns each year on the state forest.
7. Use prescribed fire to maintain fuel breaks on a 3–4 year rotation.
8. Conduct on an annual basis as many priority-one prescribed burns as possible to restore or maintain needed habitat and to prepare sites for forest regeneration work.

Guideline:

Judiciously use prescribed fire in order to maintain and restore species biodiversity in fire adapted ecosystems.

Fire Prevention

Desired future condition.—The state forest is free from human-caused wildfire, in order to minimize adverse effect to ecological and socio-economic values.

Goals:

1. Reduce the number of human-caused wildfires.
2. Reduce the risk of large crown fires in conifer cover types.

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Objectives:

1. Work in conjunction with other wildfire agencies to raise the public awareness of wildfire conditions during periods of high wildfire danger.
2. Use prescribed burns in concert with silvicultural prescriptions for the purpose of reducing fuel loads before hazardous conditions are reached, especially to reduce the potential for large crown fires in conifer cover types.
3. Reduce the number of human caused wildfires through public education and the regulation of open burning with the issuance of burn permits.

Fire Suppression

Desired future condition.—The DNR protects the health and safety of the public by effectively coordinating the suppression of wildfires that occur upon all ownerships within a protection area, incorporating the need to protect private property and ecological and socio-economic values, and also ensuring the health and safety of firefighters.

Goals:

1. The DNR Forest, Mineral, and Fire Management Division functions as the lead agency in wildfire management in the state.
2. Forest, Mineral, and Fire Management Division field offices are staffed and equipped to provide wildfire suppression action as called for in Fire Management Plans.
3. Provide wildfire training to DNR firefighters and local fire department personnel per an agreement with the Michigan Fire Fighter's Training Council. All DNR firefighters will be trained to National Wildfire Coordinating Group standards as laid out in the Forest, Mineral, and Fire Management training standards.
4. Participate in state wide interagency wildfire organizations and the Great Lakes Forest Fire Compact.

Objectives:

1. Work in conjunction with other wildfire agencies to attempt to contain most wildfires to 10 acres or less in size.
2. Ensure that annual refresher training for DNR wildland firefighters includes familiarization with assigned wildland fire equipment.
3. Promote efforts designed to increase the capability of local fire departments, including programs such as the Volunteer Fire Assistance Program, Federal Excess Property Program, GSA Purchasing Program and Fire Fighters Training Council Wildland Fire Training Programs.
4. Review employee training and qualification records annually to assure that they progress toward and maintain wildland fire suppression qualifications identified for them in the "Michigan Addendum to the National Wildfire Coordinating Group (NWCG) National Interagency Incident Management System (NIIMS) Wildland Fire Qualification System Subguide PMS 310-1".
5. Encourage DNR FMFM land managers and other DNR employees to maintain wildland fire qualifications and CDL qualifications.
6. Conduct wildfire detection according to daily fire danger levels.
7. On each wildfire incident under DNR jurisdiction, implement the Incident Command System to guarantee safe and effective conduct of the suppression effort.
8. Ensure that the Incident Commander conducts an After Action Review for all incidents that have at least 3 responding resources, and that the Marquette and Roscommon Incident Coordination Centers conduct an Administrative Fire Analyses for all Type 3 incidents managed by DNR.

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Hiawatha National Forest Fire Management

Hiawatha National Forest fire management seeks to reduce fuels and restore forests to historically natural conditions with tools such as prescribed fire, while also preventing and suppressing unwanted wildfires.

From Forest Management Plan 2006, Chapter 2: Forest-Wide Management Direction 5100 Fire Management

Desired Conditions

The Forest has a reduced risk from catastrophic wildland fire due to healthy forests and increasing resilience to the effects of wildland fires. Accumulations of natural and activity fuels are treated to enhance ecosystem resiliency and to maintain desired fuel levels. Prescribed fire is present on the landscape, restoring or maintaining desirable plant community attributes, processes and functions. Wildland fire is actively suppressed, where necessary, to protect life and valuable resources.

Prescribed Natural Fires

Goal:

Natural fires are allowed to occur within prescribed parameters within designated old growth, wildernesses, research natural areas and candidate research natural areas.

Objective:

In this planning period, develop prescribed natural fire plans for all wildernesses and research natural areas.

Fuel Management

Goals:

1. Prescribed fire, mechanical treatments and other tools are used to establish, maintain or improve vegetative conditions.
2. Vegetation is treated in high fire hazard areas within the wildland/urban interface areas to reduce the risk from wildland fire.
3. Fuels are reduced and vegetation in the understory of stands that have historically had natural occurring low intensity surface fires is controlled.
4. Hazardous fuel loads are reduced where catastrophic disturbances such as windthrow occur.

Objective:

In this planning period, reduce wildfire risks by fuel management of an average of 1,000 acres per year.

Wildfire Prevention

Goal:

Wildfire prevention activities emphasize joint efforts with state, Tribal, local and other federal agencies.

Objectives:

1. In this planning period, the Forest will work with other agencies to prevent wildfires through:
 - Unified state-wide interagency reporting system
 - Fire prevention education and training
 - Public information development and dissemination
 - Grants and agreements

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- Community at risk protection plans
2. In this planning period, develop community wildfire protection plans for three high risk communities. Work in cooperation with other governmental agencies and private property owners.

Fire Suppression

Goal:

Fires are managed in a safe and economically efficient manner giving consideration to the effects on resource values and risks to life and property.

Objective:

Prior to the fire season each year, update the Hiawatha Fire Management Action Plan.

Guidelines:

1. Minimum impact management tactics should be used on wildland fires and prescribed fires to reduce adverse fire suppression effects.
2. Delivery of chemical retardant, foam, additives or gray water to surface water should be avoided.

*Hiawatha National Forest is divided into specific Management Areas based on the purpose and goals/desired conditions, and each area has specific management standards and guidelines that may affect fire management strategies. Fire management should be based on the management area guidelines set forth in the HNF Forest Plan 2006 and the current HNF Fire Management Plan 2011.

*Also see Federal Wildland Fire Management Policy 2001.

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VIII. Fire Protection and Emergency Management

Local Fire Protection Agencies and Resources

Fire protection in the form of wildfire suppression plays a very important part in the protection of communities from wildfire disaster. Without dedicated fire professionals wildfire would cause much more damage than is typical today, but time and resources are limited and it is important to be aware of current firefighting agencies, coverage areas, and resources.

Protection Agencies

Fire protection agencies have very large areas to cover and resources are limited in Eastern Delta County. While fire protection personal will do their best to protect private property from wildfire, safety of human life including firefighters is top priority.

The most effective action a landowner can take is to proceed with mitigation steps in advance of wildfires by reducing the flammability of structures and surrounding vegetation. Section IX. discusses these proactive mitigation strategies in detail.

Hiawatha National Forest is responsible for wildfire suppression activities within the USFS proclamation boundaries. MDNR is responsible for wildfire suppression outside of the USFS proclamation boundary. Township fire departments are primarily responsible for structure fires on private and local government properties, but also assist with wildfire control. In some cases, Mutual Aid Agreements have been written to allow for cooperation among agencies and departments. In other cases, no written mutual aid agreements are in place, but cooperation happens when requested and through contracts.

Primary fire protection agencies for Eastern Delta County		
Name	Coverage Area	Mutual Aid Agreements
Hiawatha National Forest	Primary wildfire response within USFS proclamation boundary	MDNR; Ensign, Masonville, Nahma, Garden
Michigan Department of Natural Resources	Overall wildfire suppression within Michigan & assist USFS when requested on USFS property; primary wildfire response for Garden Township south of US 2	HNF; Ensign, Masonville, Nahma, Garden
Ensign VFD	Ensign Township structural	MDNR; HNF; County-wide with all township fire departments
Masonville VFD	Masonville and Bay De Noc Townships structural	MDNR; HNF; County-wide with all township fire departments
Garden VFD	Garden Township structural	MDNR; HNF; County-wide with all township fire departments; Tri-County
Nahma VFD	Nahma Township structural	MDNR; HNF; County-wide with all township fire departments
Tri-County VFD (Alger, Schoolcraft and Delta Counties - located in Alger County)	Northern Garden, Nahma and Masonville townships (bounded approximately by 442 and 440 on the south, into Alger county in the north, H05 on the west, and into Schoolcraft county in the east)	MDNR; Garden (agreement needs updating)

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Fire Protection Resources

Hiawatha N.F. (West Zone) Fire Suppression Resources		
Equipment Type	Count	Location
Type 6 engine with 300gal	3	Munising, Rapid River, Manistique
Type 7 engine with 150gal water tank mounted on pick-up truck	2	Rapid River
Bulldozer with V-plow	1	Various locations
ATV's, chainsaws, portable pumps, etc	NA	Various locations

Michigan DNR Fire Suppression Resources		
Equipment	Count	Location
Type 7 Engine	1	Fayette State Park (additional equipment in Thompson Township Field office)

Township VFD Fire Suppression Resources		
Fire Station	Equipment	Count
Nahma Township VFD	1969 Ford F-800 Pumper 1000gpm	1
	1996 GMC Tanker 2000gpm	1
	1980 Chevrolet Pumper 1000gpm	1
	1985 Chevrolet 4WD Brush Truck 250gal with Foam	1
Masonville Township VFD	2000 Pierce 1250gpm, 1,000gal	1
	1985 Ford F-700 2000gal	1
	1979 Ford F-700 1250gal	1
	1976 Pierce 300gpm	1
	1989 Chevy Flat bed with plow, 2000gpm	1
Ensign Township VFD	Engine-Compressed Air Foam-1250gpm, 1000gal	1
	Type 6- Compressed Air Foam, 150gpm, 150gal	1
	Tender, 200gpm, 2000gal	1
	Tender, 250gpm, 2000gal	1
	8 Wheel Amphibious ATV 50gal	1
	Gorman-Rupp, 1000gpm (6")	1
Garden Township VFD	1985 Chevy pick-up 250gal. with Foam	1
	1979 Ford 150gpm, 2,000gal	1
	1998 GMC 250gpm, 2,000gal	1
	2004 Freight Liner Pumper 1250 gpm, 1,000gal	1
	2008 GMC 4500 250gpm, 350 gal with foam	1
Tri-County VFD	1984 Chevy 4x4pick-up 250 gal Bush Truck	1
	1979 Wagner 6x6 Tanker 1200 gal	1
	1977 Ford Pumper 1250 gpm, 1000 gal	1
	1976 Ford Tanker 1800 gal	1

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Water Resources

Water is crucial in the suppression of wildfire. Much of the planning area is remote and relies upon access to suction points at lakes, streams and other natural water sources. Hydrants are sparse and are generally located in or near major population centers. The success of a fire department operation hinges on the distance a truck must travel to fill-up and return to the fire. In many cases these fill-up points are often long distances from the fire and the firefighters are unable to maintain an uninterrupted water source at the scene.

Reliable water sources, whether natural or man-made should be located strategically in the highest risk WUI areas near concentrations of structures and other values that may be threatened by wildfire.

All five townships covered within this plan have at least some reliable water sources, but additional water sources (dry hydrants) should be added when feasible and are noted in the action recommendations.

Primary Water Sources Types

- **Wet Hydrant:** These are stationary, pressurized hydrants connected to a municipal water source. They are uncommon in the planning area, and can be found in Rapid River and Garden.
- **Dry Hydrants:** These are stationary, typically unpressurized hydrants that are generally accessible year-round and source from reliable water bodies below the ground surface. Water is extracted by drafting and pumping.
- **Cistern dry hydrants:** These are underground storage tanks with dry hydrants that are used in areas where water supply is scarce or very near structures of concern, often in higher density areas.
- **Suction Points:** These are water bodies that are accessible to having a pump inserted to extract water. Availability access can vary depending on changes in land ownership, water levels, and winter weather.

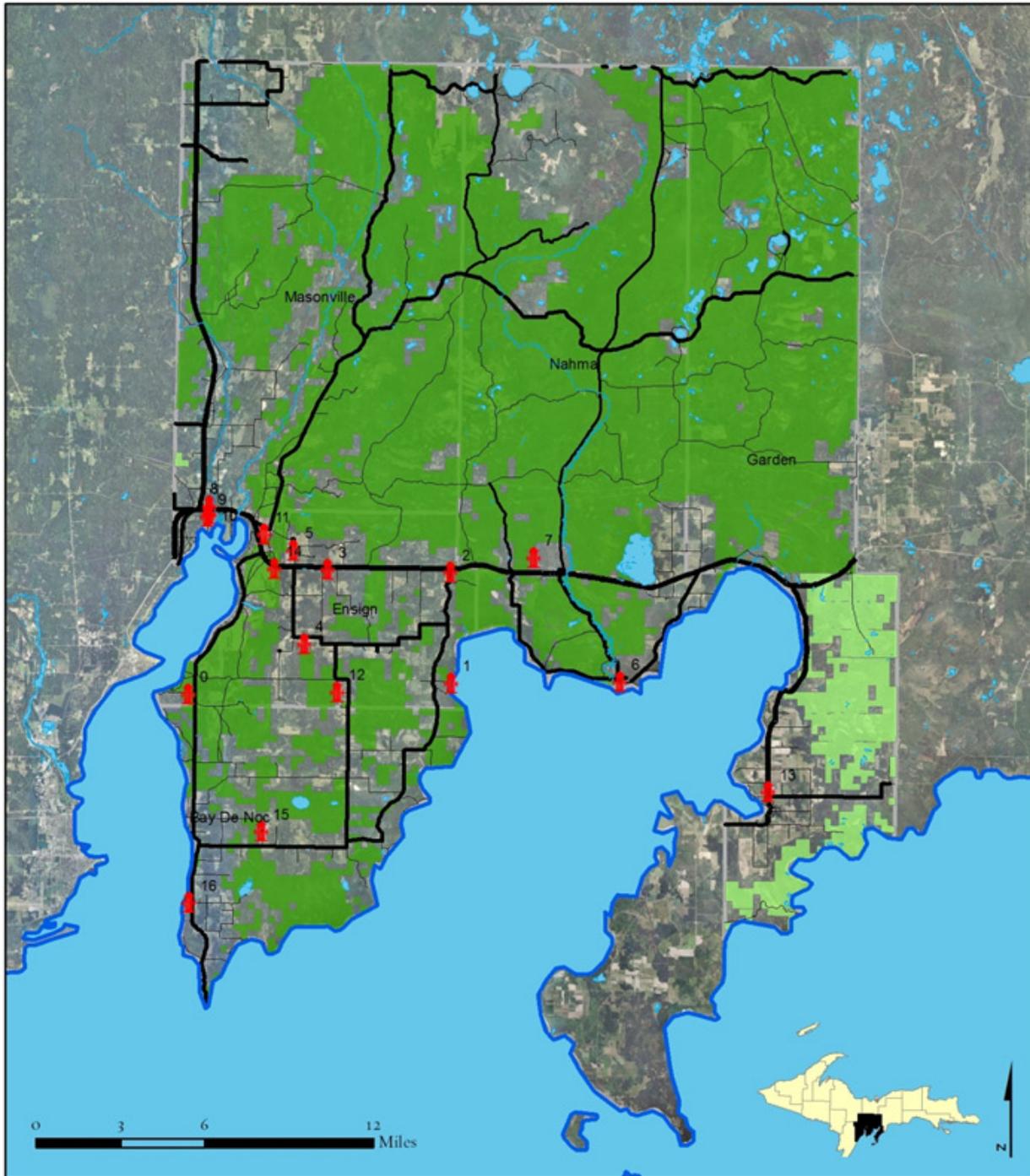
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Existing Dry Hydrants

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- Planning Area Townships
- Dry Hydrants
- Highways
- County Roads
- Federal Forest Roads
- Local Access Roads
- Public Land
 - Hiawatha National Forest
 - Michigan DNR



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Existing Dry Hydrants			
Map Id	Type	Location	Township
0	Dry Hydrant	Twin Springs PK 20.5 Lane USFS 1,000,000gal cap	Ensign
1	Dry Hydrant	Mouth of Big River/ Ogontz 20.7 Lane-unlimited cap	Ensign
2	Dry Hydrant	US 2 and Co rd 503 - Hansen 97,000 cap	Ensign
3	Dry Hydrant	US 2 - Pratt 272,000 gal cap	Ensign
4	Dry Hydrant	Behind Rustic sawmill 97,000gal cap	Ensign
5	Dry Hydrant	Co Rd 511 W.5 Rd - Shorts	Ensign
6	Dry Hydrants	Nahma	Nahma
7	Dry Hydrant	Small pond	Nahma
8	Dry Hydrant	N Main Street - Rapid River	Masonville
9	Dry Hydrant	Wisconsin Street - Rapid River	Masonville
10	Dry Hydrant	S Main Street - Rapid River	Masonville
11	Dry Hydrant	Rapid River School	Masonville
12	Dry Hydrant	Pond owned by S.Belongie 75,000gal cap	Ensign
13	Dry Hydrants	Garden Village	Garden
14	Dry Hydrants	Stock Yard Pond-U.S 2	Ensign
15	Dry Hydrants	5935 Olson V.5 Rd	Bay De Noc
16	Dry Hydrants	Farmer's Dock 4923 Co 513T Rd	Bay De Noc

Safety Considerations

Firefighting in the Wildland Urban Interface can be extremely dangerous, especially within highly flammable fuels such as jack pine. Firefighter safety should always be the number one priority and saving a structure should be a secondary priority. There are many ways to help improve the safety of firefighters and the general public. Some important considerations are below:

- All homes, businesses should have two-way, reflective, non-flammable emergency number identification signs.
- All streets with homes or businesses should have two-way, reflective, non-flammable street name identification signs.
- Driveways should be at least 12-14 feet wide with at least 14 feet of clearance above to allow for large emergency vehicles to pass (NFPA 299).
- Driveways should have enough room for large emergency vehicles to turn around at the end of the driveway.
- There should always be at least one and preferably two egresses (exits) for escape from a structure fire.
- There should be adequate pull-offs on narrow roads to allow for emergency vehicles or other vehicles to pass especially if the road is an escape route for someone.
- Turn-arounds should be located at the end of dead-end roads.
- Adequate safety zones should be identified near fires to protect firefighters and equipment.
- Bridges should be rated to at least 20 tons for safe access for large emergency vehicles.

Structural Triage

Structures cannot always be safely saved during wildfire. Often times there are conditions or hazards that prevent a structure from being saved, and it is important to determine not only if the structure needs protection, but

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also whether it can be safely and successfully saved.

The structural triage checklist categorizes the defendability of a structure based on specific criteria (Appendix D). This checklist should be used only as a guide to help firefighters determine whether to save a structure, but this does not replace the decision making of experienced firefighters.

1. Structure does not need defending as there is adequate defensible space, and Firewise principles have been implemented.
2. Structure needs defending, and can be saved with aggressive firefighting as there are only a few risk factors.
3. Structure needs defending and can be saved but should be done so with extreme caution as the risk is high and there are several risk factors.
4. Structure is indefensible as the risk is extremely high with excessive risk factors.

Emergency Medical Services

Emergency medical response times in eastern Delta County can be slow due to large distances and few medical responders. Primary medical responders are listed below.

Medical Responder Name	Coverage Area
Masonville Township	Basic Life Support (non-transporting) for Masonville, Ensign, and Bay De Noc Townships
Rampart EMS	Basic Life Support within Delta County and intercepts into neighboring counties
Tri Star EMS	Basic Life Support for Nahma, Garden Townships

*Contact your county emergency management office for more information on hazard and emergency issues in Delta County and for the Delta County Hazard Mitigation Plan 2005.

IX. Wildfire Mitigation Strategies

The wildfire mitigation strategies discussed below can be useful tools in reducing or preventing the detrimental effects of fire on humans and forests.

* Hiawatha National Forest is divided into specific Management Areas based on the purpose and goals/desired conditions, and each area has specific management standards and guidelines that may affect mitigation strategies. Mitigation strategies should be based on the management area guidelines set forth in the HNF Forest Plan (2006) and the current HNF Fire Management Plan (2011).*

Wildfire Suppression and Containment

Wildfire suppression as an initial attack tactic is often necessary to prevent the spread of fire into areas that humans do not want to burn, but suppression can also prevent wildfire from reducing flammable fuels and restoring forest health. In the long run this can cause dangerous vegetative fuel build-ups and unhealthy forests.

Initial response to a wildfire can lead to very different outcomes. Each wildland fire should be evaluated individually based on incident objectives to determine if it poses a real threat to human values and if not, containment may be a better option. Allowing a fire to burn within a contained area may allow fire to play its natural ecological role, while posing little risk to communities in the present, and reducing risk into the future.

Additionally, wildfire suppression activities such as fire lines and trenches, heavy machinery, etc. often end up causing more damage to the landscape than the fire itself would have, potentially leading to costly and time consuming restoration or long term ecological damage. Suppression actions should be well planned and strategically implemented to minimize risk to human values, and maximizing wildfire as a tool to restore forest health and reduce vegetative fuels.

Vegetative Fuel Reductions: Protecting Communities and Restoring Forest Health

Reduction of vegetative fuels can be an effective way to reduce wildfire risk. Fuel reduction treatments can be used to break the horizontal continuity of wildfire, in turn slowing the progression, and reducing the intensity and size of wildfire. Fuel reductions can also restore health to forests that are overcrowded and/or diseased due to long term fire exclusion and suppression.

The primary goal of vegetative fuel reductions for this plan is to reduce wildfire risk to communities within the moderate to high risk rated areas of the WUI, but ecological health of the forest should also be considered when identifying and recommending vegetative fuel reduction treatments. Priority should be given to forest treatments that can accomplish both community protection goals and restoration of forest health in fire-adapted ecosystems. Healthy forests have reduced fuel loads and less insect and disease mortality, and can be at less risk of catastrophic wildfire.

Vegetative fuel reductions can be accomplished mechanically, through the use of wildland fire or through chemical herbicide treatments and may be used in combination. Treatments within the ½ mile WUI and along primary roads or evacuation routes should be a priority.

Use of Wildland Fire

Use of wildland fire results in less surface disturbance than with mechanical methods and can minimize erosion or invasive species introductions. Fire also encourages the growth of some native plants and enhances wildlife habitat for certain species.

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Prescribed fire is a method of fuels treatment that is used in order to mimic the natural occurrence of periodic fire disturbances. Prescribed fire is applied by fire professionals, generally at low intensity when social and environmental circumstances allow. It is most effective for reduction of ground and surface fuels such as leaf litter, dead wood, brush and some ladder fuels.

Management of wildfire is the application of the appropriate management response to naturally-ignited wildland fires to accomplish specific resource management objectives in pre-defined designated areas outlined in Fire Management Plans where communities are not at risk, and where social and environmental and conditions allow.

Use of wildland fire is has been identified by both federal and state agencies as a management tool to reduce vegetative fuel, therefore restoring health to natural systems, and reducing risk of catastrophic wildfire.

According to federal policy as stated in Wildland Fire Use: Implementation Procedures Reference Guide 2005, wildland fire will be used to protect, maintain and enhance resources and, as nearly as possible, be allowed to function in its natural ecological role. Use of fire will be based on approved fire management plans and will follow specific prescriptions contained in operational plans.

The Hiawatha National Forest 2006 Forest Plan identified a goal where natural fires are allowed to occur within prescribed parameters within designated old growth, wildernesses, research natural areas and candidate research natural areas.

According to the Michigan State Forest Management Plan 2008, the state forest will employ prescribed fire as a natural management tool, within the context of other ecological and socio-economic uses with 2 primary goals:

1. Use prescribed fire as a natural tool for maintaining healthy conditions in fire-adapted ecosystems and landscapes.
2. Use prescribed fire to help maintain fuel breaks.

Mechanical

Heavy machinery can cause disturbance to the soil which can be good or bad depending on the treatment goals.

- **Reduction of Ground and Surface Fuels:** By reducing the ground and surface fuels such as leaf litter, shrubs, and branches (ladder fuels) as much as 6-10 feet vertically, wildfire can be easier to control as potential flame length is reduced. Fire can also be prevented from reaching the tree canopy, torching and turning into dangerous crown fires.
- **Vegetative Thinning:** Thinning of single or groups of trees and shrubs 10-15 feet apart can slow the spread and reduce the intensity of wildfire. Large fire-resistant tree species should be retained when possible.
- **Crown Thinning:** Thinning of single or groups of trees to reduce the density of tree crowns makes a tree-to-tree crown fire less likely. Large fire-resistant tree species should be retained when possible.
- **Strategic Fuel Break:** Removal of vegetative fuels to create a break in the continuity of fuels. Breaks can be effective in slowing or stopping ground, surface or crown fire and should be wider to prevent the spread of crown fire (at least 1 ½ times flame length). Fuel breaks are often created around areas or structures to be protected.

Chemical Herbicide

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Herbicides can be used to kill vegetation, but do not reduce biomass accumulation so should be followed up with fire or mechanical treatments. Herbicides may work particularly well for certain invasive species. Chemicals can be hazardous to the environment especially if applications are near water sources.

Equipment and Infrastructure Improvements

Wildfire mitigation equipment, infrastructure and personnel can be in short supply in eastern Delta County because of limited funds. When funding is available, improvements to equipment and infrastructure should be sought to help reduce the risk of catastrophic wildfire.

Types of improvements include:

- **Water Sources:** Additional dry hydrant or suction points in the WUI can increase the odds that a firefighter can suppress a wildfire or structural fire.
- **Signage:** Additional and improved signage at roads and driveways can increase the likelihood of rapid response to wildfire and structural fires.
- **Equipment:** New equipment may add additional firefighting capability, and may also be more reliable.

Community Education and Outreach

Long term community education and outreach is essential to reducing the risk of catastrophic wildfire in eastern Delta County. Communities in the Upper Peninsula may underestimate the potential frequency and severity of wildfire, and only prolonged and targeted outreach and education will create a citizenry that is educated on the inevitable risks of wildfire and the personal actions that can be taken to protect themselves and their property and that of firefighters. The National Fire Protection Association (NFPA) provides educational materials for no cost at www.nfpa.org. Choose the “Catalog” tab at the top, and enter “Firewise” or “Wildland Urban Interface” into the search box. Alternatively go to www.firewise.org and choose the “Catalog” tab at the top which will direct you to the NFPA site. This site also has excellent web-based Firewise courses and trainings.

For education to be successful it should be targeted towards both children and adults and sustained over many years to promote better understanding of the benefits and risks of wildland fire and the importance of proper preparation in advance of potential wildfire.

- First, education should clearly explain the role of wildland fire in healthy forests, and other benefits of wildland fire.
- Second, education should identify the primary causes of wildfire so that unplanned, human caused ignitions are kept to a minimum.
- Third, education should teach people how to live safely in areas that are at risk of wildfire. It can happen, and proactive preparation is the best action to keep a wildfire from becoming a catastrophic wildfire.

Preparedness and Protection Improvements for the Home or Business Owner

Reducing Structural Ignitability

Reducing structural ignitability is one of the most effective ways to protect homes and other structures during wildfire. The **time to implement these steps is before a wildfire starts** as it will greatly increase the likelihood that that your home will survive a wildfire. Homes and structures can be a fuel source for wildfire. There are proven methods to break the continuity of fire as it approaches a home as well as ways to make your home a less flammable fuel source.

Defensible space

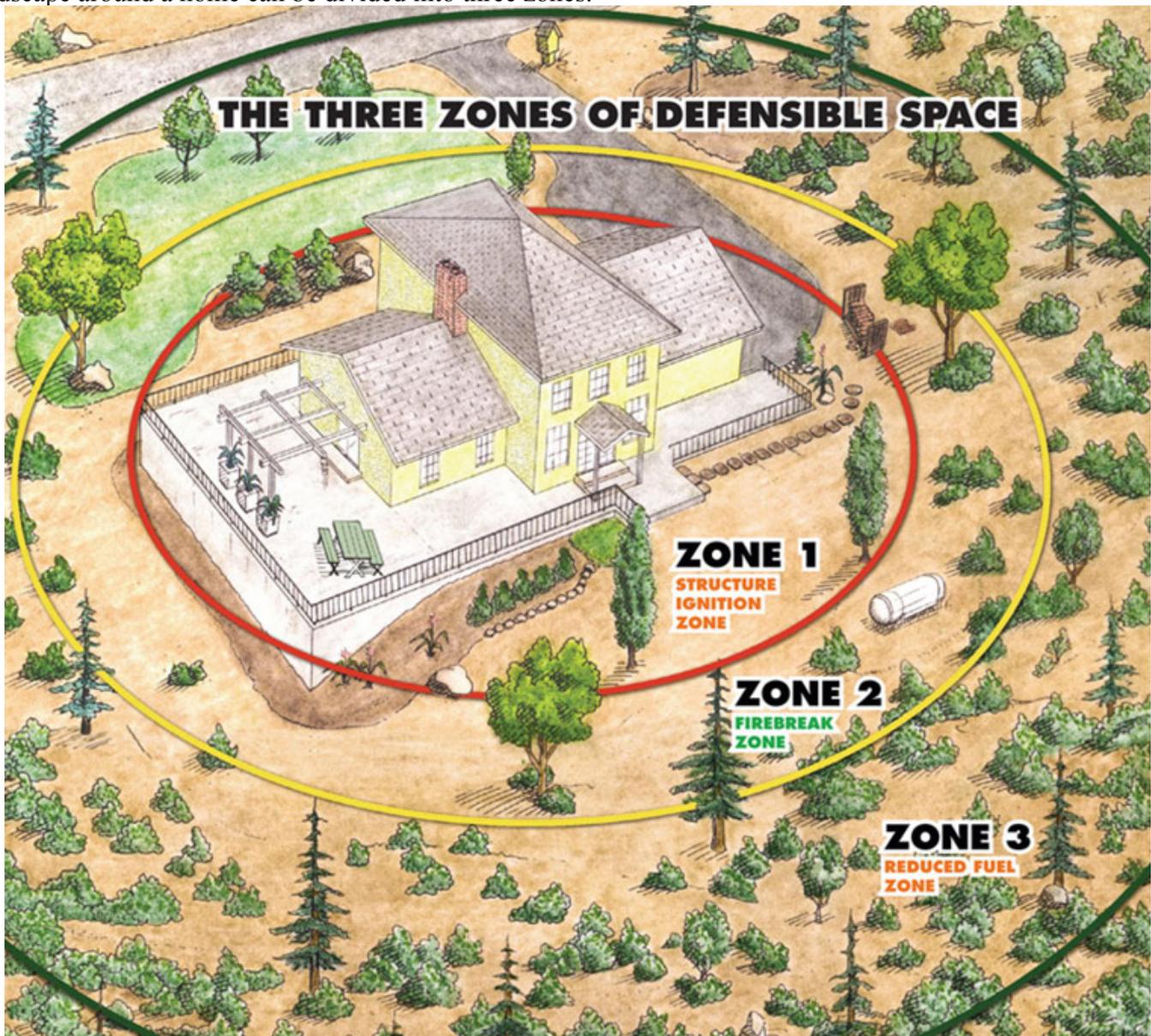
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The primary way to protect your home from a wildfire is to create defensible space around it. By creating an area around your home where wildfire will move more slowly and with less intensity, your home will be more easily and safely defended by firefighters, if it needs to be defended at all. **It is the responsibility of the property owner to create defensible space before a wildfire begins.**

Home Ignition Zone

The Home Ignition Zone extends 100-200 feet from a home or other structure depending on the specific characteristics of the property, such as vegetation types and slopes. Creating and maintaining the Home Ignition Zone reduces or eliminates vegetative ignition hazards.

By modifying the landscape around your home to create a defensible space, wildfire risk will be reduced. The landscape around a home can be divided into three zones.



Napa Firewise: <http://www.napafirewise.org/defensable-space-live/img/sections/4/zonesmap.jpg>

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Zone 1 is the Home Ignition Zone. Creating and maintaining 30 feet of defensible space in this zone reduces ignition hazards caused by flammable vegetation and construction. Vegetation should be fire resistant and kept to a minimum. This area should be mowed, well irrigated and provide adequate space for fire suppression equipment. Only low growing, fire resistant plants should be within 3-5 feet of the structure. Ideally, there should be a 3 foot buffer between house and plants. Any evergreen trees should be well-spaced and thinned so that crowns do not touch and tree limbs should be pruned 2-10 feet vertically. Keep dead leaves and needles cleaned up so they cannot carry fire to the home.

Zone 2 is the area from approximately 30-100 feet that should have fire resistant, low growing plants and widely spaced trees. Ensure evergreen trees are thinned and pruned so that crowns do not touch and limbs are removed 6-10 feet vertically.

Zone 3 is the furthest zone at 100 feet to 200 feet. This area is the natural area of native vegetation. Highly flammable plants should be selectively removed or thinned and pruned.

Other Recommendations

- Store firewood away from your home, preferably 25 feet from your home.
- Store flammable fuel away from your home. Keep vegetation mowed around fuel storage structures or tanks. Better yet, place non flammable rock around fuel storage structures and tanks.
- Maintain fuel breaks such as mowed lawns, sidewalks and driveways.
- Have at least 100 feet of water hose available.
- When burning vegetation debris get a burn permit first. Burn during winter when snow is on the ground or when it is wet. Burn in the early morning or evening when it tends to be cooler. Cover burn barrels with ¼ inch screen. Never leave fire unattended. Have water and tools on hand to contain unplanned ignitions.
- Debris can be composted rather than burned. Composting can be done on site, or taken to a composting facility.
- Close garage door prior to emergency evacuation.
- Clean dead leaves and needles from under decks and porches, and from eaves as firebrands can ignite the debris

Firewise Construction

By following some basic guidelines in the construction and remodeling of homes and structures, the structure can be made less flammable to direct wildfire and firebrands.

- Enclose any open spaces such as eaves, and screen soffits and gable vents to prevent ignition by fire brands.
- Enclose the base of porches and decks with non-combustible skirting to prevent ignition of firebrands.
- Use non-combustible roofing and siding materials. Avoid wood shakes.
- Keep chimney clean and add a spark arrestor.
- Install double paned windows and close prior to emergency evacuation.

Living with Fire - Basic Concepts to Remember for Living with Fire in Eastern Delta County

Fire is a dynamic element in many areas of Eastern Delta County. Your land has likely burned before and will likely burn again. The landscape where you live today may seem “natural,” but in fact it has changed dramatically over the last 150 years as we have attempted to manage fire. In preparing your property for fire, you can

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help restore it to a more ecologically appropriate state. In doing so, you will learn how to be prepared for wildfire. While it is impractical to completely “fire proof” your property, there are many steps you can take to better withstand a potential wildfire.

One size does not fit all in terms of homeowner fire safety. Every place is unique. Work with your local fire departments, Cooperative Extension Agent, Registered Professional Forester, contractors, Hiawatha National Forest, and/or Michigan DNR to design the appropriate defensible space for your property.

Your home exists within a larger watershed. It is located in the midst of a much larger landscape. Think about where your property is on the slope. Are you on top of a ridge, where fire will easily burn toward your home? Is your slope steep or gentle? Fire moves quickly up steeper slopes, which means that you may need to treat a larger area to create your defensible space. What is below and above you? What direction, or “aspect,” does your property face? Generally, south-facing properties are hotter and drier; they can therefore be more susceptible to fire. Are there any natural firebreaks around you such as streams, rivers, rocky outcrops, or roads where a fire might naturally go out? Do wildlife use or move through your property to get to food, shelter, or water? In what watershed are you located? Do the roads in and out of your property follow ridges or rivers? Look beyond your property lines to understand the ecological perspective of your place.

Fire can behave both predictably and unpredictably. We can generally predict fire direction and behavior; it will go the way the wind is blowing and burn as much fuel as is available. Predicting the exact time and place where fire will burn is less obvious. As fire moves across the landscape it can climb up into your trees. A key safety objective is to prevent that spread.

Dead leaves and branches on the ground (surface fuels) act as a wick to move fire horizontally across the land. Shrubs, small trees, and live branches (ladder fuels) can carry fire vertically into the larger trees. Too much of these surface and ladder fuels can cause the overstory trees to burn up in what is called a “crown fire”—when fire spreads from tree to tree in the forest canopy (or tree tops). One of the main principles in **creating defensible space and reducing hazardous fuel conditions** is to create physical space between vegetation layers (both vertically and horizontally) so a fire cannot climb easily from the ground into the trees or to your home.

Timing is important. There are appropriate times for different actions on your property, much as there are different seasons of work in your garden. Do your defensible space and fuel reduction work well before fire season to avoid having sparks from equipment start fires in dry vegetation.

Avoid ground-disturbing activities in your forest or wildland when the ground is too wet or when birds and animals are nesting. Don’t try to do everything at once—**think about your fire safety seasonally**: plan your activities in the winter and spring; start clearing when the ground begins to dry (when it’s not saturated) or when there is snow on the ground; finish treatments by early summer before the vegetation is dry; do your defensible space maintenance around and inside your home in the fall; and burn your piles after the rains and snows begin in the winter.

Your house is likely a fuel source. Many Delta County homes are located in places where a fire can start and spread into surrounding vegetation. The more you prepare your house and other structures, the less you will have to treat the surrounding vegetation. The biggest improvement you can make to reduce your fire risk is to build or remodel your house to resist the millions of tiny embers created by wildfires. When wildfires burn in extreme conditions they send burning firebrands (embers) ahead of them; these firebrands ignite new fires.

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Using fire-resistant building materials and appropriately designed structures will give you the best chance to survive wildfire. Replace wood shake roofs with fire-resistant materials. Don't let your home be part of the problem. Consult your local professionals.

If you are building a new home, consider slope, aspect, surrounding fuels, and your potential environmental impacts before deciding where to site your home. This may be more important than the view in the long term. Talk to your local planning department to learn about any local fire safe building regulations.

Firefighters need your help to protect your home. Make it safe for them and their equipment to get to and from your house. Be sure they can find you with visible road and address signs; or make sure your driveway is wide enough for fire equipment to pass. Remember that fire resistant landscaping and construction greatly improves firefighters' ability to protect your home.

Conservation Principles for the Homeowner

These conservation principles should be incorporated as much as possible as fire management planning and mitigations actions are carried out, but community safety will always be the first concern.

Consider the Conservation Principles below in how you approach your wildfire safety and defensible space. Balance is important. It is possible to have an aesthetically pleasing landscape that is fire resistant, supports local plant and animal species, and still provides you with privacy and plantings.

Remember the Vegetation (Native Trees and Other Plants)

Discover and monitor your forest and vegetation's dynamic changes. Plan for the future of your property and forest. Because you are the conservation steward of your land, your work will be ongoing. Watch the wild areas on your property and learn from them as they grow and change with your stewardship. Think both in the short term (what will happen this year) and the long term (what will happen over time). Document those changes as the years go by. Learn how to monitor the ecological changes on your property and use that information for adaptive management of your wildlands. To live with wildfire we need to take the responsibility to manage, adapt, and guide the vegetation around our homes. For more information see www.dnr.state.mi.us/publications/pdfs/huntingwildlifehabitat/Landowners_Guide/Habitat_Mgmt/Planning/Evaluating_Land.htm.

Act conservatively

We are manually recreating a more fire-resilient landscape. In doing this, we need to apply the general concepts of the precautionary principle while implementing fuel treatments: you can always remove more trees and vegetation at a later time, but you cannot immediately replace what you have cut. The vegetation you leave is ultimately most important. Be sure that what you remove is done with careful planning and consideration to ensure that what you leave standing is healthy and resilient or in the case of standing dead trees (snags), not a threat to your home or other values if it burns.

Protect native species that share your home

Look at the native vegetation around your property—or ask a local plant or forestry specialist for help—to see what different plants share your home. There may be plants that are rare. If so, protect them by providing defensible space (while keeping in mind their needs, such as shade). Find out if those plants exist in other areas within your watershed and how they are being managed there.

Watch for invasive weeds. Follow vegetation treatments with invasive weed removal. Minimize the introduction

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of exotic plant species near your home, especially those that can spread into adjacent wildland areas. Invasive species can change your fire hazard very quickly and be difficult to manage.

Keep the oldest and biggest trees

Generally, most of the oldest trees in the forest are no longer present. If you have old or very large trees, create defensible space around them so they will survive wildfire. This may include raking away thick duff at the base of the trees. Notice that these trees often have thick bark so they are generally fire-resistant (they have evolved with fire). Think about their protection in terms of building a fire in your woodstove: A big log won't start burning without a lot of smaller kindling (e.g. small trees, shrubs, branches, etc.). In your forest, make sure that the smaller kindling isn't around the bottom of your big trees, and generally the trees will make it through a wildfire on their own. In some cases, you'll need to remove smaller trees that touch the crown of the tallest trees. At the same time, you don't want to remove all of the small trees in your forest. Small trees are the next generation of large trees. Keep enough regeneration, possibly in small patches, to provide for the future forest, while still providing adequate space between all the trees you keep standing. An additional benefit of keeping your biggest trees is that they can break up the wind as it's moving through, which can slow down fire spread.

Remember the Wildlife

Provide local wildlife a place to live. Become familiar with the animals that share your property. Talk to local wildlife experts and/or bird watchers. Learn what wildlife need in terms of shelter, food, water, and reproduction. Remember that your property is their home too. Find ways to balance your land management activities with their needs, and leave some areas untreated for the birds and wildlife using them. Protect them as you would your home by creating defensible space while still considering their needs for cover. If you watch quietly you may see animals using those areas.

Provide access to food and water

Protect and retain trees with nests and cavities, or where obvious wildlife feeding or nesting activities are occurring. Leave some plants that have berries or other fruit or mast used by wildlife. Act especially carefully and leave cover around streams, seeps, or other wet areas to keep those areas cool and wet; this will provide wildlife the protective cover they need when they are using those places or moving to and from them. Make sure all natural water supplies are clean by keeping any poisons and sediment away from any water that could drain into them. For more information, see www.dnr.state.mi.us/publications/pdfs/huntingwildlifehabitat/Landowners_Guide/Habitat_Mgmt/Backyard/Backyard_Intro.htm.

Protect future generations of wildlife

Find out when local species are nesting and/or breeding and avoid working in and around your wildlands during those times. Learn what kind of habitat local species might use for nesting and breeding, and be sure to protect those areas during your management activities.

Value the standing dead trees

Standing dead trees—or snags—are especially important for wildlife. They provide both shelter and food to many birds and other animals. However, they can also be a wildfire hazard if they are near enough to fall on your home or fall and block an evacuation road during a fire. Balance the needs of wildlife with your need for fire safety. Think about your home within the landscape; if you've got snags in the area, you don't need them next to the house. Take the time to find the most appropriate actions for your unique place. Perhaps you can create defensible space around a snag to prevent it from causing a fire to spread if the tree ignites.

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Conserve Threatened and endangered species

One of the bonuses—and responsibilities—of living in the Upper Peninsula is living with the many wild animals with which you share habitat. Find out if there are rare or endangered species in your area by talking to your local US Forest Service or state wildlife biologist. Plan your fuel reduction actions around the needs of these species. Often by a fairly minor refinement of your activities, such as timing, technique, or extent, you can protect species while realizing your fuel reduction goals.

Remember the Soil

Maintain the life in your soil

There is as much or more activity below the ground on your property as there is above the ground. Keep this in mind in terms of what you do above ground. Talk to your Cooperative Extension Agent or local gardeners to find out what soil types are on your property. Some soil types can tolerate much more disturbance than others. Minimize activities that could compact, flood, or poison your soil. The health of your land is directly dependent on the health of your soil. As such, the soil is one of the most valuable assets of your property.

Ensure that your soil cover is fire safe

Reduce dry and dead litter in your defensible space. Alternatively, replace cover that burns easily (such as dry or dead vegetation) with cover that is less flammable (e.g. gravel, fleshy green plants, etc.), especially within 3-5 feet of a structure. The objective is to ensure that if and when a fire comes through, it is not so hot that it kills the life in your soil. Rather, it should move through without a lot of fuel to consume in its path. For example, a very light layer of pine needles can help with soil erosion, but too much can be a fuel problem.

Minimize erosion

Protect your soil by keeping it covered. Cover helps to prevent erosion, especially on ground that is not flat; it keeps the soil in place. Don't let soil move across your property; most importantly not into streams or other natural water sources. Keep ground-disturbing activities away from unstable areas and riparian areas. Pay special attention on steep slopes. The steeper the slope, the faster the soil can move downhill if it's disturbed, and the faster a fire can climb uphill under the right (or wrong) conditions.

Protect your soil after a fire

Soil can be most fragile after a wildfire. This is often exacerbated when rains come soon after a fire. The potential for erosion and loss of soil is huge with this combination of conditions. If you have experienced fire on your property, get native plant cover onto your soil as soon as you can to prevent erosion. Remember, your soil is alive, so help it grow.

Remember the People

Plan your actions with your neighbors

Talk to your neighbors. Find out what they are doing on their land. Find ways to cooperate in your land management actions. Your defensible space will likely impact your neighbor's chances of surviving a wildfire and vice-versa. Talk about what to do in an emergency and how to most safely evacuate. Help make your community a Firewise community. Coordinated work amongst neighbors will have a greater impact on your individual fire safety. For more information, see www.firesafecouncil.org, and www.firewise.org.

Find experienced workers and treat them well

Forestry workers with chainsaws in hand are the actual decision-makers as to what stays or goes—what lives or dies—in your forest. If your objective is to reduce fuels while still maintaining ecological integrity and diversity

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on a site, your workers must have the knowledge and experience to help you achieve this. Involve the workforce in the design, planning, and monitoring of projects. Talk to neighbors and check references to find reputable contractors.

Work with your local fire department

Talk to your local firefighters. Find out what they need to safely get to your house and back out. Make sure that your access roads are safe; maintain your fuel treatments along all roads, both for firefighter safety in protecting your home and your safety in case of evacuation. Let firefighters know where you live and what's on your property; invite them out to see it. Have street and address signs visible so out-of-town firefighters can find you if there is a big fire. Make sure you have a water supply they can find and use. Know where and how to turn off any fuel sources such as natural gas or propane.

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X. Action Plan

The following tables outline the recommended mitigation actions that have been identified. Action should be initiated on many of these items at the adoption of this plan by the steering committee. Many of the actions will require additional funding sources and/or additional planning and approval. Any project may change, be delayed or be canceled. Before beginning any fuel reduction projects contact your local fire, forestry and biological professionals to ensure your project is appropriately designed and meets all laws and regulations.

Mitigation action items are not in any way limited to those listed below. Additional action items may be identified and are encouraged as circumstances change and additional information becomes available.

Recommended Mitigation Projects

Fuel Reduction and Restoration						
Type and Name	Implementation & Rationale	Treatment Acres	Township	Ownership & Lead Entity	WUI	Year?
Schawee Lake Thinning	To initiate fuel reductions around homes and development.	~109	Ensign	Ownership: Private Lead Entity: Ensign Township and USFS	Yes	Unk.
CR513 Thinning	To initiate fuel reduction along CR513 and homes	~7	Ensign	Ownership: Private Lead entity: Ensign and Twonship and USFS	Yes	Unk.
RxBurn-Dutch Mill 3	Opening maintenance for habitat restoration and WUI protection	103	Masonville	USFS	Yes	2011-2012
RxBurn-Dutch Mill 7	Opening maintenance for habitat restoration and WUI protection	48	Masonville	USFS	Yes	2011-2012
RxBurn-Dutch Mill 8	Opening maintenance for habitat restoration and WUI protection	70	Masonville	USFS	Yes	2011-2012
RxBurn-Dutch Mill 9	Opening maintenance for habitat restoration and WUI protection	6	Masonville	USFS	Yes	2011-2012
RxBurn-Dutch Mill 2	Opening maintenance for habitat restoration and WUI protection	23	Masonville	USFS	Yes	2011-2012
RxBurn-Dutch Mill 5	Opening maintenance for habitat restoration and WUI protection	43	Masonville	USFS	Near	2013+

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RxBurn-Dutch Mill 4	Opening maintenance for habitat restoration and WUI protection	56	Masonville	USFS	Near	2013+
RxBurn-Dutch Mill 1	Opening maintenance for habitat restoration and WUI protection	132	Masonville	USFS	Yes	Unk
RxBurn-Dutch Mill 6	Opening maintenance for habitat restoration and WUI protection	90	Masonville	USFS	Near	2013+
RxBurn-Little Ridge 3	Opening maintenance for habitat restoration and WUI protection	72	Ensign	USFS	Near	2012-2013
RxBurn-Little Ridge 4	Opening maintenance for habitat restoration and WUI protection	45	Ensign	USFS	Yes	2012-2013
RxBurn-Little Ridge 5	Opening maintenance for habitat restoration and WUI protection	30	Ensign	USFS	Near	2013
Mechanical-Little Ridge 6	Opening maintenance for habitat restoration and WUI protection	14	Ensign	USFS	Yes	2011
Mechanical?-Little Ridge 7	Opening maintenance for habitat restoration and WUI protection	10	Ensign	USFS	Yes	2014
Mechanical?-Little Ridge 8	Opening maintenance for habitat restoration and WUI protection	7	Masonville	USFS	Yes	2014
Mechanical?-North Schawee 1	Opening maintenance for habitat restoration and WUI protection	28	Masonville	USFS	Yes	2014-2015
Mechanical?-North Schawee 2	Opening maintenance for habitat restoration and WUI protection	16	Masonville	USFS	Yes	2014-2015
RxBurn-North Schawee 4	Opening maintenance for habitat restoration and WUI protection	41	Masonville	USFS	Yes	2015-2017+
RxBurn-North Schawee 5	Opening maintenance for habitat restoration and WUI protection	20	Ensign	USFS	Yes	2015-2017+
RxBurn-EastPoint1	Opening maintenance for habitat restoration and WUI protection	47	Ensign	USFS	Near	2014-2015+

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RxBurn-EastPoint2	Opening maintenance for habitat restoration and WUI protection	24	Ensign	USFS	Yes	2014-2015+
RxBurn-EastPoint3B	Opening maintenance for habitat restoration and WUI protection	7	Ensign	USFS	Yes	2014-2015+
RxBurn-EastPoint 4	Opening maintenance for habitat restoration and WUI protection	9	Ensign	USFS	Near	2014-2015+
RxBurn-East Point 5	Opening maintenance for habitat restoration and WUI protection	28	Ensign	USFS	Near	2014-2015+
RxBurn-Savanna 1	Opening maintenance for habitat restoration and WUI protection	20	Ensign	USFS	Yes	2014-2015+
RxBurn-Savanna 5	Opening maintenance for habitat restoration and WUI protection	25	Ensign	USFS	Near	2014-2015+
RxBurn-Savanna 7	Opening maintenance for habitat restoration and WUI protection	16	Ensign	USFS	Near	2014-2015+
Mechanical-Little Ridge Comp35Stand19	Opening maintenance for habitat restoration and WUI protection	6	Ensign	USFS	Near	2014
Mechanical-Little Ridge Comp35Stand17	Opening maintenance for habitat restoration and WUI protection	2	Ensign	USFS	Near	2014
Mechanical Fuel Break Lines-Stonington	Fuel breaks to stop or slow the spread of fire	NA	Ensign, Bay De Noc	USFS	Yes & Near	2012-2013
Mechanical Fuel Break Lines-County Rd 509	Fuel breaks to stop or slow the spread of fire	NA	Masonville	USFS	Yes & Near	2012-2013
Organize Fuel reduction “workbees”	Create defensible space around homes of seniors or the physically disabled	Unk.	All	Township VFD’s	Yes	Ongoing
Identify additional fuel reduction projects in areas where dry jack, red and white pine forests (ELT 10, 20) coincide with the WUI.	Additional fuel reduction projects (not yet identified) on private, state and federal lands may be critical in reducing wildfire risk and restoring forest health.	Unk.	All	USFS; VFD’s; MDNR	Yes	Ongoing

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Notes: Fuel treatments are preliminary estimates and are subject to change. Contact the appropriate landowner or lead entity and local fire professionals, foresters and biologists.

Fire Preparedness and Protection					
Type	Implementation Rationale	Target Area	Township	Ownership & Lead Entity	WUI?
Additional Dry Hydrants	To provide for more reliable water access for suppression in WUI	Localized	All	Townships	Yes
Road Improvements	Improved accessibility for fire protection equipment	Round Lake, Mahskeeke Lk, Gooseneck Lake, Stevens Lake, CR 509, CR 442, Schawee Lake Area	Ensign, Garden, Masonville, Nahma	County and private	Yes
New Signage	To ensure all roads and homes are identified by 2-way reflective signs	Throughout Planning Area	All	Township VFD's and governments	Yes
Equipment	Ensure VFD's have adequate resources to safely and effectively suppress structure fire	Throughout Planning Area	All	Township VFD's	Yes
Home Assessments	Improve preparedness of private homeowners	Throughout Planning Area	All	Township VFD's	Yes
New fire ordinances or building codes (see Appendix ...for sample ordinance)	Ensure new ordinances/codes recommend common sense precautions for new construction	Throughout Planning Area	All	Township VFS's and governments	Yes
Personal pumps at lake houses	Encourage private lakeside landowners to have a portable on hand for unintended ignitions	Lakeside WUI areas	All	Township VFD's	Yes
Advertise firewise home assessments by VFD's for a donation	Prepare and educate private landowners and raise funds for VFD's	Throughout Planning Area	All	Township VFD's	Yes
Triage Training	Fire triage decision making for VFD's	Throughout Planning Area	All	Township VFD's	Yes
Mutli-agency "tabletop" training and preplanning	Better coordination between agencies and departments	Throughout Planning Area	All	Township VFD's	Yes

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Project Type: Education and Outreach					
Type	Implementation and Rationale	Target Audience	Township	Lead Entity	WUI
Become a Firewise Community	Educate private landowners on Firewise Principles for safer living in fire prone areas	Private landowners in WUI	All	Township VFD's in cooperation with MSU extension	Yes
Firewise Landscaping Educational Sessions	Educate private companies to encourage them to incorporate Firewise landscaping into work	Landscaping companies and landscape design specialists	All	Township VFD's in cooperation with MSU extension	Yes
Firewise Construction Educational Sessions	Educate private companies to encourage them to incorporate Firewise construction techniques into work	Contractors and building inspectors	All	Township VFD's in cooperation with MSU extension	Yes
Firewise, Defensible Space-Home ignition Zone Education	Educate private landowners on Firewise Principles for safer living in fire prone areas	Home and business owners	All	Township VFD's in cooperation with MSU extension	Yes
Eagle scout or student Firewise projects	Educate private landowners on Firewise Principles for safer living in fire prone areas	Young people	All	Township VFD's	Yes
Building Permit Inserts	Educate private landowners on Firewise Principles for safer living in fire prone areas	Home and business owners	All	Township VFD's and local and county governments	Yes
Radio messages for burn permit program	Educate people on how to get a debris burning permit to reduce unintended human caused fires	Home and business owners	All	Township VFD's and MDNR	NA
Land Use Planning and Zoning in Wildfire Prone Communities	Encourage planning and zoning to incorporate wildfire planning in WUI	Township and county planners and zoning officials	All	Township and county governments	Yes
UP State Fair Targeted Firewise Displays	Maximize educational opportunities where people congregate	Home and business owners	All	Township VFD's in conjunction with MSU Extension	NA
Firewise display/presentation at Tri-County VFD Annual fundraiser	Maximize educational opportunities where people congregate	Home and business owners	NA	Tri-County VFD	NA

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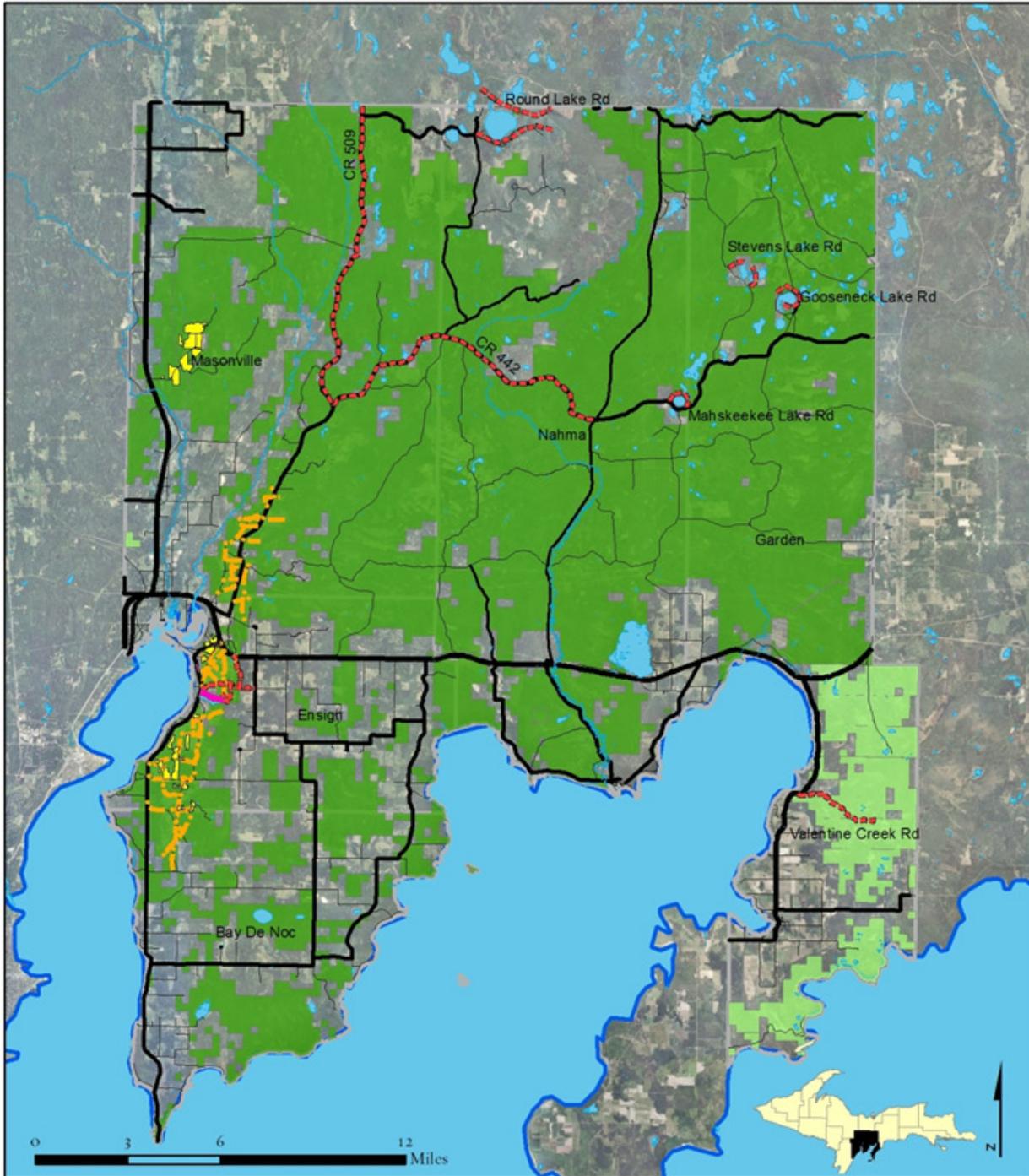
Administrative		
Type	Timeframe	Implementation Rationale
Grant applications	Annual	Seek funding annually to implement actions items
Assessment training	As needed	Home assessment training by MSU extension for VFD's
Plan update and maintenance	Annual	Monitor and evaluate progress and effectiveness of action items
Update Mutual Aid Agreements	As needed	Ensure Mutual Aid Agreements between VFD's, USFS, and MDNR are current

Recommended Fuel Reductions & Road Improvements



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- | | | |
|----------------------------|-----------------------------|--------------------------|
| Planning Area Townships | Highways | Hiawatha National Forest |
| Fuels Reductions - USFS | County Roads | Michigan DNR |
| Fuels Reductions - Private | Federal Forest Roads | Local Access Roads |
| Fuel Breaks - USFS | Potential Road Improvements | |



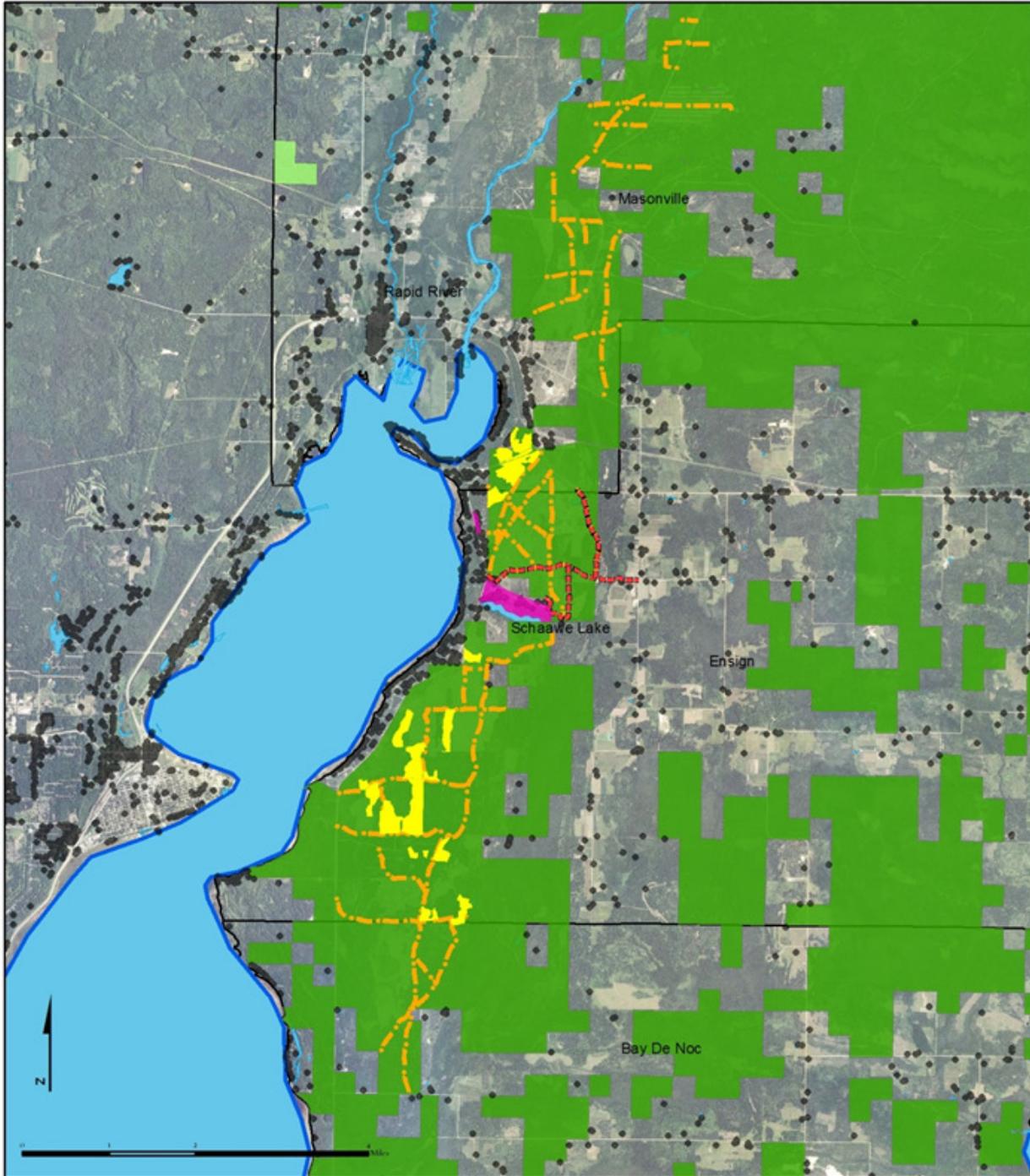
Recommended Fuel Reductions & Road Improvements Stonington Peninsula Risk Area



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- CWPP Townships
- Fuels Reductions - Private
- Fuels Reductions-USFS
- Fuel Breaks-USFS
- Structures

- Public Land**
- Hiawatha National Forest
 - Michigan DNR



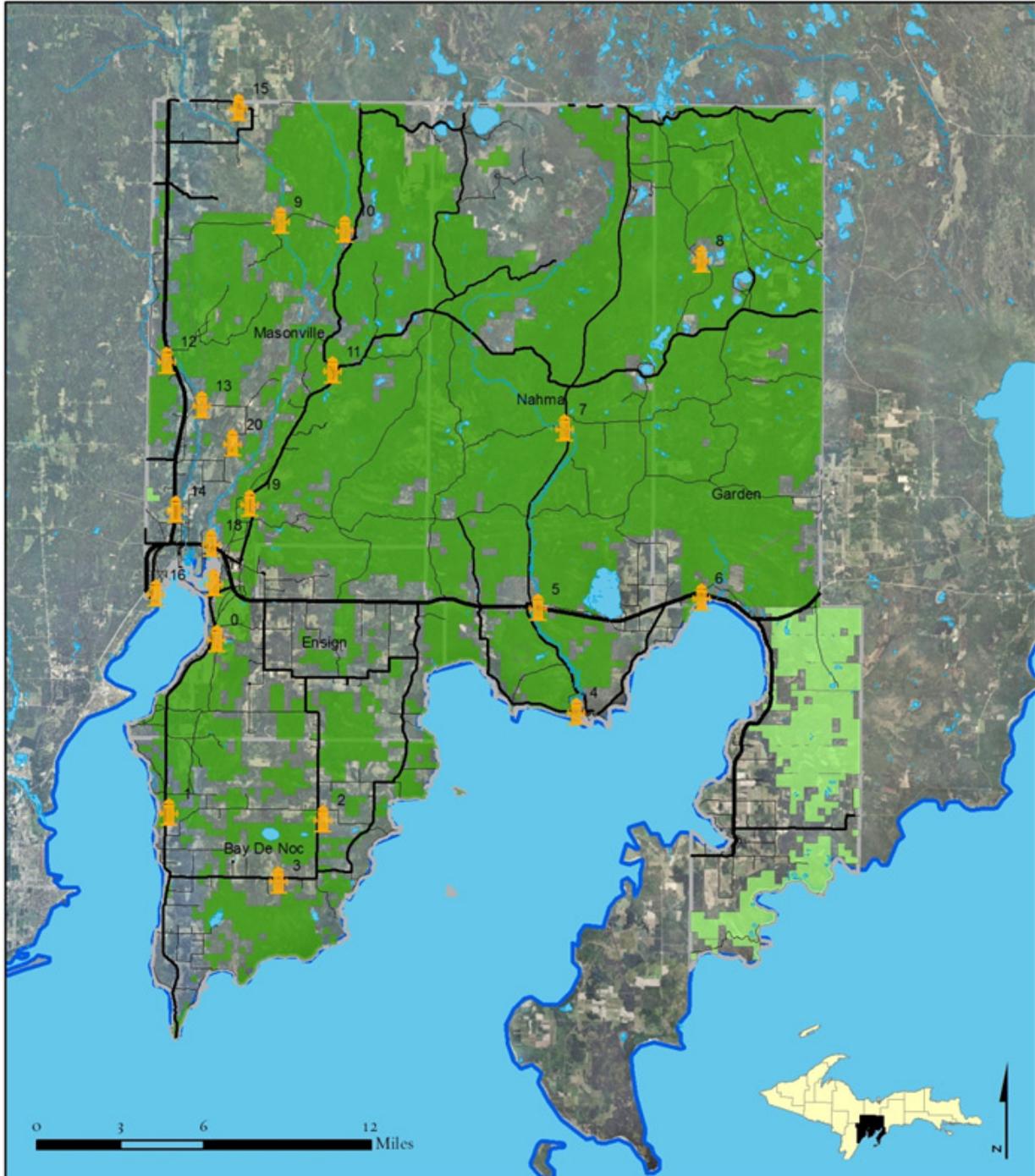
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Potential Dry Hydrants

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- Planning Area Townships
- Potential Dry Hydrants
- Highways
- County Roads
- Federal Forest Roads
- Local Access Roads
- Public Land
 - Hiawatha National Forest
 - Michigan DNR



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Potential Dry Hydrant Locations			
Map Id	Location	Township	WUI
0	South Schaawe Lake	Ensign	Yes
1	USFS Pond-gravel pit	Bay De Noc	Yes
2	Pond	Bay De Noc	Yes
3	Hardwoods Pond - currently used as suction	Bay De Noc	Yes
4	West of Nahma	Nahma	Yes
5	Sturgeon River	Nahma	Yes
6	Big Fish Dam	Garden	No, but very near
7	Sturgeon River	Nahma	Yes
8	Lake	Garden	Yes
9	Osier Cut Across West Branch Whitefish River 38th Rd	Masonville	Yes
10	Osier Cut Across East Branch Whitefish River 38th rd	Masonville	Yes
11	Hay Meadow CR 509	Masonville	No, but very near
12	Rapid River Dutch Mill S. 15	Masonville	Yes
13	Rapid River Pineaus Pond 32nd Rd	Masonville	Yes
14	Holding pond 1.5 mile north of US 2 on HWY 41	Masonville	Yes
15	John Anderson's Pond 1/4 mile south Cnt Ln 444	Masonville	Yes
16	lake at Bayshore Drive between S.75 and S40	Masonville	Yes
17	lake at Sterling Resort U .65 Ln	Masonville	Yes
18	Whitefish River Bridge at US 2	Masonville	Yes
19	Bills Creek CR 509	Masonville	Yes
20	Payne and Dolan V.25 Rd	Masonville	Yes

XI. Long-Term Recommendations and Monitoring

This document should not be seen as the end of the planning process, as significant time and resources have been spent to develop this plan; the adoption of the plan should be considered the beginning of long-term wildfire mitigation and forest restoration actions. The process of implementing recommended action items and seeking associated funds should begin at the adoption of this plan. Many projects can be pursued at the township level, but may be more effective if implemented across multiple townships within the planning area.

The plan should be considered a working document to be reviewed and improved upon by the current planning committee on an annual or biannual basis, as the risks from unplanned wildfire are continuous and ever changing.

Monitoring and Evaluation

Periodic monitoring and evaluation are essential to ensure that CWPP plan objectives and priorities are being effectively met or continue to meet the needs of the planning area communities by reducing wildfire risk and restoring forests and other landscapes to a healthier state. Monitoring should involve a diverse group of interested stakeholders of which the current steering committee is a good start. Section 102(g)(5) of the HFRA instructs the USFS to establish collaborative multiparty monitoring, evaluation, and accountability process when sufficient interest exists in order to assess positive social or ecological effects of fuel reduction projects. A short guide to multiparty monitoring and assessment can be found at: http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5274477.pdf

Adaptive Management and Performance Measures

Adaptive management is a process by which we can learn from our actions and apply what we have learned to future actions. For the Eastern Delta County CWPP, current projects should have a replicable and measurable approach with effects that can be and are monitored and analyzed, and then incorporated into new projects. Performance measures provide a way to identify success and failures in action items, so that the implementer of CWPP projects can adapt to changing circumstances or new information and identify a more effective plan of action moving forward. The following table identifies some suggested performance indicators.

Action Goals	Performance Measures
Fuel Reduction and Restoration	<ul style="list-style-type: none"> • Acres Treated and fuel type • Miles of fuel breaks • Effectiveness of treatments at meeting fire behavior or restoration objectives • Treatment longevity • Treatment costs • Number of Home Ignition Zone Assessments • Number of homeowners implementing Firewise principles around structures • Healthy forests - Forests moving towards Condition Class I where fuels reductions have been implemented.

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Fire Preparedness and Protection	<ul style="list-style-type: none">• Miles of road improvements• Number of dry hydrants installed• Number of signs installed or replaced• New equipment acquired• Number of fire ordinances• Number of personnel trained
Education and Outreach	<ul style="list-style-type: none">• Number public education programs• Number of public presentations• Number of CWPP's distributed
Administrative	<ul style="list-style-type: none">• Number of personnel trained• Grant funding award totals• Plan updates• Mutual Aid Agreement updates

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XII. Funding Sources

The total cost of potential wildfire mitigation actions generally exceed available funding, so new funding sources should be continually sought to help pay for any current and future action items. This CWPP can be leveraged to apply for **National Fire Plan, Pre Disaster Mitigation, and other federal and state grant programs.**

FEMA offers grants to fire departments to enhance their ability to protect the public and fire service personnel from fire and related hazards. www.firegrantsupport.com/html/fps The three grant types available are:

- Assistance to Firefighters Grant (AFG): The primary goal of the Assistance to Firefighters Grants (AFG) program is to meet the firefighting and emergency response needs of fire departments and nonaffiliated emergency medical services organizations.
- Staffing for Adequate Fire and Emergency Response (SAFER): The SAFER Grant was created to provide funding directly to fire departments and volunteer firefighter interest organizations in order to help them increase the number of trained, “front-line” firefighters available in their communities.
- Fire Prevention and Safety (FP&S): The FP&S grants support projects that enhance the safety of the public and firefighters from fire and related hazards. The primary goal is to target high-risk populations, firefighter safety and mitigate high incidences of death and injury.

The state of Michigan offers **Michigan Volunteer Fire Assistance** to assist fire departments in acquiring firefighting equipment for local communities. To be eligible, the fire departments must be in rural communities with population less than 10,000 people and that have publically-owned forested land within the protection area. http://www.michigan.gov/dnr/0,4570,7-153-58225_37985-125034--,00.html

Other Funding Sources or Funding Resources:

Firewise Communities/USA Program

<http://www.firewise.org/Communities/USA-Recognition-Program/Grants-and-funding/Federal-government.aspx>

First responder Institute

http://www.firstresponder.org/grant_details.htm

Assistance to Firefighters Grant Program (AGFP)

<http://www.usfa.dhs.gov/fireservice/grants/afgp/index.shtm>

Catalog of Federal Domestic Assistance

<https://www.cfda.gov/>

Funding Alternatives for Fire and Emergency Services

<https://www.usfa.dhs.gov/downloads/pdf/publications/fa-141.pdf>

U.S. Fire Administration-FEMA-Grants and other fire information

<http://www.usfa.dhs.gov/fireservice/fireservice//emr-isac/index.htm>

The Federal Excess Personal Property Program

<http://www.fs.fed.us/fire/partners/fepp/>

XIII. Appendix

Appendix A. Wildfire Issues Brainstorming Results

December 2, 2010 CWPP Brainstorming Session

Risks/assets	Suppression	Public Education	Solutions
Rapid River School	Volunteer Fire Department Personnel	Elementary School Programs	More/New Water Sources-dry hydrants
Homes-WUI-Access/Egress	USFS Personnel	Pre-Plan	Road and Driveway Access
Twin Springs Campground	DNRE	Firewise-Defensible space, woodpiles, propane, wood construction, driveways, etc-Website?	Community Awareness/Education
Vagabond Campground	Water Sources-Dry Hydrants, ponds, lake access		ID Escape Routes
Pipeline	Enough Equipment		Coordination of Responding Agencies-mutual aid agreements
Camps-Access/Egress	Law enforcement/evacuation	Jackpine Progression map	Communications
Railroad	Air resources available?	Radio messages/Burn permit program	Training-Multi agency-Tabletops-preplans
Business	Inadequate personnel		"All" Township ordinances
US-2	Accessibility	Field trip	Info book(who, what is where)
Powerlines-Utility Corridor	Communications	Role of Fire Ecosystem	Road signs and maps updated (aerial photos of "sectioned" HNF)
PVT woodlots-Not managed	Weather	Prescribed Burn Programs	More funding
School	Fuels		Fuels reduction work-Prescribed Fire & Mechanical
Grocery	Road Identification		GPS of High Risk Areas
Motels	Road Improvements		
Evacuation-esp elderly folks	Traffic control		
Natural & Manmade			
Radio tower-North of US 2?			
Water Sources			
Foliage/maintenance			
Road Identification			
Jack Pine-North Side of US 2			

Appendix B. State of Michigan 4.1.8 Fire Management (From Michigan State Forest Management Plan April 10, 2008)

4.1.8.1 Fuel Management

Desired future condition.—The state forest is managed to maintain fuel loads within the range of natural specific ecosystem variability in order to minimize adverse effect to ecological and socioeconomic values.

Goals:

Reduce excessive fuel loads outside of the natural range of variability for specific community types to reduce the hazard of catastrophic wildfires to forest resources and public and private facilities.

1. Work with other fire agencies and local units of government to encourage land owners and residents within the wildland-urban interface to reduce excessive fuel loads and to establish “defensible space” landscapes around structures.

Objectives:

1. Prescribe salvage cuts where appropriate to reduce fuel loads in areas with extensive mortality due to disease or insect infestations, while also considering the biodiversity values associated with snags and large woody debris.
2. Reduce the potential for large crown fires in conifer species by reducing the occurrence of fuel ladders, excessive basal area, and inadequate crown spacing. The vegetation management program is the primary means by which this will be accomplished.
3. Identify “communities at risk” and “fire prone landscapes” as geographic areas of possible concern.

Standards:

DNR FMFMD Policy and Procedure 251, Sale and Removal of Timber, issued March 1, 2000.

Monitoring criteria.

Statewide Criterion 2 – Ecosystem Condition and Productivity, Indicators 2.1, 2.4

Guideline:

Through forest management prescriptions, strive to balance the retention of forest litter, large woody debris, and snags with a reduction of excessive fuel loads that can contribute to catastrophic stand fires, which result in the loss of biomass and the alteration of carbon balances.

4.1.8.2 Prescribed Fire

Desired future condition.—The state forest employs prescribed fire as a natural management tool, within the context of other ecological and socio-economic uses.

Goals:

1. Use prescribed fire as a natural tool for maintaining healthy conditions in fire-adapted ecosystems and landscapes.
2. Use prescribed fire to help maintain fuel breaks.

Objectives:

1. Prioritize all approved department prescribed burns by October 1st of each year.
2. Use prescribed burning in the forest stands to reduce competition for the growth of desired herbaceous and woody vegetation and for site preparation for forest regeneration.

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3. Use prescribed burning in grassland areas to control encroachment by brush and trees.
4. Use prescribed burning in dedicated state Natural Areas and other areas of the state forest that contain communities where periodic fire is a natural ecologic process for the purpose of simulating natural conditions for the preservation or restoration of plant or wildlife species.
5. Use prescribed burning on other DNR-owned lands within the landscape (Parks and Wildlife divisions managed areas).
6. As determined by Operations Inventory/IFMAP prescriptions and within weather and budgetary constraints, attempt to conduct a minimum of 25 prescribed burns each year on the state forest.
7. Use prescribed fire to maintain fuel breaks on a 3–4 year rotation.
8. Conduct on an annual basis as many priority-one prescribed burns as possible to restore or maintain needed habitat and to prepare sites for forest regeneration work.

Standards:

1. NRC Policy 4208, Burning – Prescribed, issued January 1, 1977.
2. DNR Policy and Procedure 33.42-08, Prescribed Burning, issued July 11, 2005.
3. DNR Policy and Procedure 33.42-09, Wildfires in State Natural Areas, issued July 11, 2005.
4. DNR FMFMD Policy and Procedure 512, Annual Fire Plan, dated December 13, 1999.
5. DNR FMFMD Policy and Procedure 581, Prescribed Burning, undated.

Monitoring criteria.

Statewide Criterion 2 – Ecosystem Condition and Productivity, Indicator 2.1

Guideline:

Judiciously use prescribed fire in order to maintain and restore species biodiversity in fire adapted ecosystems.

4.1.8.3 Fire Prevention

Desired future condition.–The state forest is free from human-caused wildfire, in order to minimize adverse effect to ecological and socio-economic values.

Goals:

1. Reduce the number of human caused wildfires.
2. Reduce the risk of large crown fires in conifer cover types.

Objectives:

1. Work in conjunction with other wildfire agencies to raise the public awareness of wildfire conditions during periods of high wildfire danger.
2. Use prescribed burns in concert with silvicultural prescriptions for the purpose of reducing fuel loads before hazardous conditions are reached, especially to reduce the potential for large crown fires in conifer cover types.
3. Reduce the number of human caused wildfires through public education and the regulation of open burning with the issuance of burn permits.

Standards:

1. NRC Policy 4206, Burning - Control of Open Burning, issued June 8, 1989.
2. DNR FMFMD Policy and Procedure 521, Forest Fire Law, dated June 16, 1981.
3. DNR FMFMD Policy and Procedure 522, Control of Open Burning, dated June 16, 1981.
4. DNR FMFMD Policy and Procedure 561, Smokey Bear Costume, dated February 15, 2001.

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Monitoring criteria.

Statewide Criterion 2 – Ecosystem Condition and Productivity, Indicators 2.1, 2.4

4.1.8.4 Fire Suppression

Desired future condition.—The DNR protects the health and safety of the public by effectively coordinating the suppression of wildfires that occur upon all ownerships within a protection area, incorporating the need to protect private property and ecological and socio-economic values, and also ensuring the health and safety of firefighters.

Goals:

1. The DNR Forest, Mineral, and Fire Management Division functions as the lead agency in wildfire management in the state.
2. Forest, Mineral, and Fire Management Division field offices are staffed and equipped to provide wildfire suppression action as called for in Fire Management Plans.
3. Provide wildfire training to DNR firefighters and local fire department personnel per an agreement with the Michigan Fire Fighter’s Training Council. All DNR firefighters will be trained to National Wildfire Coordinating Group standards as laid out in the Forest, Mineral, and Fire Management training standards.
4. Participate in state wide interagency wildfire organizations and the Great Lakes Forest Fire Compact.

Objectives:

1. Work in conjunction with other wildfire agencies to attempt to contain most wildfires to 10 acres or less in size.
2. Ensure that annual refresher training for DNR wildland firefighters includes familiarization with assigned wildland fire equipment.
3. Promote efforts designed to increase the capability of local fire departments, including programs such as the Volunteer Fire Assistance Program, Federal Excess Property Program, GSA Purchasing Program and Fire Fighters Training Council Wildland Fire Training Programs.
4. Review employee training and qualification records annually to assure that they progress toward and maintain wildland fire suppression qualifications identified for them in the “Michigan Addendum to the National Wildfire Coordinating Group (NWCG) National Interagency Incident Management System (NIIMS) Wildland Fire Qualification System Subguide PMS 310-1”.
5. Encourage DNR FMFM land managers and other DNR employees to maintain wildland fire qualifications and CDL qualifications.
6. Conduct wildfire detection according to daily fire danger levels.
7. On each wildfire incident under DNR jurisdiction, implement the Incident Command System to guarantee safe and effective conduct of the suppression effort.
8. Ensure that the Incident Commander conducts an After Action Review for all incidents that have at least 3 responding resources, and that the Marquette and Roscommon Incident Coordination Centers conduct an Administrative Fire Analyses for all Type 3 incidents managed by DNR.

Standards:

1. DNR Policy and Procedure 33.42-09, Wildfires in State Natural Areas, issued July 11, 2005.
2. DNR FMFMD Policy and Procedure 111, Field Office Staff/Hours of Work for Fire Control, dated May 19, 2004.
3. DNR FMFMD Policy and Procedure 141, Wildfire Training for Fire Departments, dated October 22, 1999.
4. DNR FMFMD Policy and Procedure 161, Physical Fitness Standards, dated February 17, 2000.

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5. DNR FMFMD Policy and Procedure 512, Annual Fire Plan, dated December 13, 1999.
 6. DNR FMFMD Policy and Procedure 511, Five-Year Unit Management Planning, undated.
 7. DNR FMFMD Policy and Procedure 513, Administrative Fire Analysis, undated.
 8. DNR FMFMD Policy and Procedure 514, Incident Command System.
 9. DNR FMFMD Policy and Procedure 521, Forest Fire Law, dated June 16, 1981.
 10. DNR FMFMD Policy and Procedure 542, Fire Operations Involving Structures, dated March 24, 1988.
 11. DNR FMFMD Policy and Procedure 572, Wildfires in State Natural Areas, dated March 15, 2001.
 12. DNR Forest Certification Work Instruction 8.1 – MDNR Staff Training for State Forest Management.
- Monitoring criteria.
Statewide Criterion 2 – Ecosystem Condition and Productivity, Indicator 2.1

Appendix C. State of Michigan Fire Laws

Natural Resources and Environmental Protection Act (Excerpt) Act 451 Of 1994
Part 515 Prevention and Suppression of Forest Fires

324.51501 Definitions.

As used in this part:

1. “Certified prescribed burn manager” means an individual who has successfully completed the certification program of the department under section 51513 and possesses a valid certification number.
2. “Department” means the department of natural resources.
3. “Domestic purposes” refers to burning that is any of the following:
 - a. A fire within the curtilage of a dwelling where the material being burned has been properly placed in a debris burner constructed of metal or masonry, with metal covering device with openings no larger than 3/4 of an inch.
 - b. A campfire.
 - c. Any fire within a building.
4. “Extinguished”, in reference to prescribed burning, means that there is no longer any spreading flame.
5. “Forest land”, subject to subdivision (f), means any of the following:
 - a. Timber land, potential timber-producing land, or cutover or burned timber land.
 - b. Wetland.
 - c. Prairie or other land dominated by grasses or forbes.
6. “Forest land” does not include land devoted to agriculture.
7. “Flammable material” means any substance that will burn, including, but not limited to, refuse, debris, waste forest material, brush, stumps, logs, rubbish, fallen timber, grass, stubble, leaves, fallow land, slash, crops, or crop residue.
8. “Prescribed burn” or “prescribed burning” means the burning, in compliance with a prescription and to meet planned fire or land management objectives, of a continuous cover of fuels.
9. “Prescription” means a written plan establishing the criteria necessary for starting, controlling, and extinguishing a burn.
10. “Wetland” means land characterized by the presence of water at a frequency and duration sufficient to support, and that under normal circumstances does support, wetland vegetation or aquatic life, and is commonly referred to as a bog, swamp, or marsh.

History: Add. 1995, Act 57, Imd. Eff. May 24, 1995;³/₄Am. 2004, Act 529, Imd. Eff. Jan. 3, 2005.

Popular name: Act 451

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324.51502 Department of Natural Resources; authority; appointment of assistants.

The department shall have charge of the prevention and suppression of forest fires and shall appoint assistants as needed to implement this part.

History: Add. 1995, Act 57, Imd. Eff. May 24, 1995.

Popular name: Act 451

324.51503 Burning permits; conditions.

1. At any time the ground is not snow-covered, a person shall not burn any flammable material on or adjacent to forest land, except for domestic purposes, without a permit from the department.
2. The department shall set the times of day and, consistent with this part, the conditions under which burning for other than domestic purposes on or adjacent to forest land is permitted.
3. Any person doing any burning on or adjacent to forest land for other than domestic purposes, prior to such burning operations, and at all times while the burning continues, shall take such action in and around the area in which the burning is done so as to prevent the spread of fire as may be required by the department.

History: Add. 1995, Act 57, Imd. Eff. May 24, 1995.

Popular name: Act 451

324.51503b Prescribed burning; liability; requirements.

1. Prescribed burning does not constitute a public or private nuisance when conducted in compliance with this part, part 55, and rules promulgated to implement this part or part 55.
2. Subject to subsections (3) and (4), a property owner or his or her agent conducting prescribed burning is not liable for damage or injury caused by the fire or resulting smoke.
3. Subsections (1) and (2) apply to a prescribed burn only if all of the following requirements are met:
 - a. The landowner or his or her designee has specifically consented to the prescribed burn.
 - b. The requirements of section 51503 are met.
 - c. There are adequate firebreaks at the burn site and sufficient personnel and firefighting equipment for the control of the fire.
 - d. A certified prescribed burn manager is present on site with a copy of the prescription, from ignition of the prescribed burn to its completion.
 - e. The damage or injury does not result from the fire escaping the boundary of the area authorized in the permit under section 51503.
 - f. The property owner or his or her agent is not grossly negligent.
4. Subsection (2) does not affect liability for injury to or death of a person engaged in the prescribed burning.

History: Add. 2004, Act 529, Imd. Eff. Jan. 3, 2005.

Popular name: Act 451

324.51504 Acts prohibited.

A person shall not do any of the following:

1. Dispose of a lighted match, cigarette, cigar, ashes or other flaming or glowing substances, or any other substance or thing that is likely to ignite a forest, brush, grass, or woods fire; or throw or drop from a moving vehicle any such object or substance.
2. Set fire to, or cause or procure the setting on fire of, any flammable material on or adjacent to forest land without taking reasonable precautions both before and while lighting the fire and at all times after the lighting of the fire to prevent the escape of the fire; or leave the fire before it is extinguished.
3. Set a backfire or cause a backfire to be set, except under the direct supervision of an established fire control agency or unless it can be established that the setting of the backfire is necessary for the purpose of saving

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life or valuable property.

4. Destroy, break down, mutilate, or remove any fire control sign or poster erected by an established fire control agency in the administration of its lawful duties and authorities.
5. Use or operate on or adjacent to forest land, a welding torch, tar pot, or other device that may cause a fire, without clearing flammable material surrounding the operation or without taking other reasonable precautions necessary to ensure against the starting and spreading of fire.
6. Operate or cause to be operated any engine, other machinery, or powered vehicle not equipped with spark arresters or other suitable devices to prevent the escape of fire or sparks.
7. Discharge or cause to be discharged a gun firing incendiary or tracer bullets or tracer charge onto or across any forest land.

History: Add. 1995, Act 57, Imd. Eff. May 24, 1995.

Popular name: Act 451

324.51505 Refuse disposal facilities; devices; conditions; rules.

Any person maintaining or operating a refuse disposal facility shall provide devices and conditions that will promote the safe operation and guard against the escape of fire. The department may promulgate rules for the implementation of this section. This part does not give the department the authority to allow burning of garbage at refuse disposal facilities contrary to part 115.

History: Add. 1995, Act 57, Imd. Eff. May 24, 1995.

Popular name: Act 451

324.51506 Violation of part causing forest or grass fires; liability.

1. Except as provided in section 51503b, a person who, in violating this part, causes a forest or grass fire is liable for all damages resulting from that fire, including the cost of any governmental unit fighting the fire.
2. Except as provided in section 51503b, this part does not affect any other right of action for damages.

History: Add. 1995, Act 57, Imd. Eff. May 24, 1995; ³/₄Am. 2004, Act 529, Imd. Eff. Jan. 3, 2005.

Popular name: Act 451

324.51507 Extreme fire hazard conditions; proclamation by governor as to use of fire; prohibited acts.

1. Whenever the governor finds that conditions of extreme fire hazard exist and that it is necessary in the public interest and for the preservation of the public peace, health, and safety, he or she may forbid, by proclamation, the use of fire by any person entering forest lands or lands adjacent to forest lands in parts of the state as he or she considers the public interest requires. The proclamation shall be in full force and effect 24 hours after notice is given by the governor.
2. During periods described in subsection (1), and in such areas as the governor proclaims, a person shall not do any of the following:
 - a. Build a campfire of any nature, except within containers at authorized campgrounds or places of habitation.
 - b. Smoke a pipe, cigarette, or cigar, except at places of habitation, authorized improved campgrounds, or in any automobile or truck.
 - c. Burn or cause to be burned any flammable material unless he or she first obtains a permit, in writing, to do so as provided in this part.

History: Add. 1995, Act 57, Imd. Eff. May 24, 1995.

Popular name: Act 451

324.51508 Emergency assistance; persons subject to call; compensation; refusal; penalty.

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The department may call to its assistance in emergencies any able-bodied male person who has reached his eighteenth birthday who, unless the person is an inmate of a state or county correctional institution, shall be paid for his services in accordance with the minimum wage law of this state and if the person refuses to assist without reasonable justification, he is guilty of a misdemeanor.

History: Add. 1995, Act 57, Imd. Eff. May 24, 1995.

Popular name: Act 451

324.51509 Fire suppression expenses; liability; determination; collection of claim; actions.

1. Except as provided in section 51503b, a person who sets fire on any land and negligently allows the fire to escape and become a forest or grass fire is liable for all expenses incurred by the state in the suppression of the fire.
2. The department shall certify, in writing, to the person the claim of the state under subsection (1) and shall list the items of expense incurred in the suppression of the fire. The claim shall be paid within 60 days and, if not paid within that time, the department may bring suit against the person in a court of competent jurisdiction in the county of the residence of the defendant or of any defendant if there is more than 1, for the collection of the claim at any time within 2 years after the fire. If the amount of the claim is cognizable by a circuit court, the department may file the suit in the circuit court of Ingham county, or in the circuit court of the county of the residence of the defendant or any defendant if there is more than 1.

History: Add. 1995, Act 57, Imd. Eff. May 24, 1995;^{3/4}Am. 2004, Act 529, Imd. Eff. Jan. 3, 2005.

Popular name: Act 451

324.51510 Prohibited acts; exception.

1. A person shall not do any of the following:
 - a. Willfully, maliciously, or wantonly set fire or cause or procure to be set on fire any forest land, lands adjacent to forest land, or flammable material on such forest land.
 - b. Willfully, maliciously, or wantonly set, throw, or place any device, instrument, paraphernalia, or substance in or adjacent to any forest land with intent to set fire to the land or which in the natural course of events would result in fire being set to the forest land.
2. This section does not apply to a prescribed burn conducted in compliance with section 51503b.

History: Add. 1995, Act 57, Imd. Eff. May 24, 1995;^{3/4}Am. 2004, Act 529, Imd. Eff. Jan. 3, 2005.

Popular name: Act 451

324.51511 Department of natural resources officer, employee, or agent; right of entry.

Any duly authorized officer, employee, or agent of the department, in the performance of his or her duty, may enter upon or enter into any premises on or in which he or she has reasonable cause to believe a violation of this part is occurring. For purposes of this section, premises shall not include buildings or dwellings.

History: Add. 1995, Act 57, Imd. Eff. May 24, 1995.

Popular name: Act 451

324.51512 Violation of part or rule; penalty.

Any person who violates this part or any rule promulgated under this part is guilty of a misdemeanor. Any person convicted of violating section 51510 is guilty of a felony and upon conviction shall be imprisoned for not more than 10 years or fined not more than \$10,000.00, or both.

History: Add. 1995, Act 57, Imd. Eff. May 24, 1995.

Popular name: Act 451

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324.51513 Administration of part; rules; investigations; surveys; construction of part as to other law enforcement agencies and local ordinances and regulations.

1. The department shall administer this part and shall promulgate rules necessary to implement this part. The department shall adopt rules governing prescribed burning and for certifying and decertifying prescribed burn managers based on their past experience, training, certification by another state, and record of compliance with section 51503b. The department shall submit the proposed rules for public hearing pursuant to the administrative procedures act of 1969, 1969 PA 306, MCL 24.201 to 24.328, within 6 months after the effective date of the 2004 amendatory act that amended this section.
2. The department may make, conduct, or participate in investigations and surveys designed to establish the cause of or responsibility for a particular forest fire or forest fire conditions generally.
3. This part does not limit or otherwise impair the jurisdiction or powers of any other department, agency, or officer of this state to investigate, apprehend, and prosecute violators of this part. This part does not preempt local ordinances or local regulations that are as restrictive or more restrictive than this part, except to the extent the ordinances or regulations conflict with the exemption from liability for, or otherwise apply to either of the following:
 - a. Prescribed burns conducted in compliance with section 51503b.
 - b. Prescribed burns conducted by a federal agency or state agency on land that the agency is authorized to manage.

History: Add. 1995, Act 57, Imd. Eff. May 24, 1995;³/₄Am. 2004, Act 529, Imd. Eff. Jan. 3, 2005.

Popular name: Act 451

324.51514 Forest fire control; interstate and federal assistance agreements authorized; employee training considered as work within state.

1. The department may enter into agreements with other states and the federal government to provide assistance and to accept assistance in the control of forest fires, including the training of personnel.
2. Any employee of the department assigned to fire control duties or training programs outside this state shall be considered the same as working inside this state for purposes of compensation and any other employee benefits.

History: Add. 1995, Act 57, Imd. Eff. May 24, 1995.

Popular name: Act 451

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Appendix D. Structural Triage

STRUCTURAL TRIAGE CHECKLIST

INCIDENT / CONFLAGRATION NAME _____

ADDRESS _____ **STRUCTURE** () of ()

GPS COORDINATES _____ **Latitude** _____ **Longitude** _____

Range _____ **Township** _____ **Section** _____

DRIVEWAY

Too Narrow or Steep to back in

YES **NO**
 Branches overhanging driveway
 Down dead fuels line driveway

IF RED / YES - UNDEFENSIBLE

ROOF

Already Involved in Fire

YES **NO**

*** IF RED / YES - UNDEFENSIBLE ***

DRIVEWAY - Dead End or longer than 200 feet

YES NO

STRUCTURE TYPE

ROOF - COMBUSTIBLE - (Asphalt Shingles or Wood)

YES NO

___ **Single Story**

ROOF - WOOD SHAKES

YES NO

___ **Two Story**

TREES - Overhanging Roof

YES NO

___ **Wood Frame** ___ **A Frame**

TREES / BRUSH - NOT Thinned in area within 30 feet of structure

YES NO

___ **Log Home** ___ **Other**

VEHICLES - Parked Outside within 30 feet of Structure

YES NO

___ **Full Time Residence**

___ **Vacation Home**

___ **Out Building**

___ **Business**

___ **Govt. Building**

SLOPE - More than 20% anywhere within 30 feet Of Structures

YES NO

SLOPE - More than 40% anywhere within 30 feet Of Structures

YES NO

___ **Other Hazards;**

DECK / STILT - Not enclosed underneath (to ground)

YES NO

POWER LINE - Overhead within 30' of Structure

YES NO

<p>0-2 YES Doesn't Need Defending</p>	<p>3-5 yes Defend Aggressively</p>	<p>6-7 YES Defend Cautiously</p>	<p>8-10 YES UNDEFENSIBLE</p>
----------------------------------------------------------	-------------------------------------------------------	-----------------------------------------------------	-------------------------------------------------

Triage Officer _____ **Unit #** _____ **Date** _____ **Time** _____

COMMENTS / NOTES ON BACK

Appendix E. Measuring the Fire Hazard of Your Home

Protect your home and the surrounding forests from wildfire ...

Homes located near forest areas are vulnerable to damage, or complete loss, if a wildfire should start in the area. Not only do the types of structural components affect the amount of damage that will be sustained, but the area around the home can contribute to fire risk.

For example, trees close to your home will allow a wildfire to spread to your home faster than if the area were clear. Furthermore, homes with inadequate fire protection and prevention features can often cause a wildfire to start.

Fortunately, there is a lot that you can do to make sure that your home is fire-safe. To help you measure your home's fire risk, and to enable you to determine where improvements need to be made, use the Forest Home Fire Risk form that follows. Fill out the form carefully and honestly.

First, examine your home and home-site carefully. Work through the form, assigning a Hazard Rating to each component under the sections for Structural Hazards, Site Hazards, and Hazard Reduction. Then, calculate your total Forest Home Fire Risk and check your score on the chart that follows the form.

Finally, and most importantly, try to reduce your home's fire risk by correcting the problem areas which you found.

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Forest Home Fire Risk Form

HAZARD	DESCRIPTION	HAZARD RATING
A. SITE HAZARDS		
(Select one response only in sections 1 through 13)		
1. SURROUNDING TREES		
	*HARDWOODS (LEAFED TREES)	
	If 10 trees within 9m or 30' ADD -----	2 _____
	If 10-20 trees within 9m or 30' ADD -----	3 _____
	If 20+ trees within 9m or 30' ADD -----	4 _____
	*CONIFERS (NEEDED)	
	If 10 trees within 9m or 30' ADD -----	3 _____
	If 10-20 trees within 9m or 30' ADD -----	6 _____
	If 20+ trees within 9m or 30' ADD -----	10 _____
	*MIXEDWOOD	
	If 10 trees within 9m or 30' ADD -----	3 _____
	If 10-20 trees within 9m or 30' ADD -----	4 _____
	If 20+ trees within 9m or 30' ADD -----	6 _____
2. LADDER FUELS		
	* Underbrush and low branches present -----	5 _____
3. TYPE OF GROUND COVER (majority of type of coverage within 9m or 30')		
	* Sand, Gravel, etc (Non-combustible) -----	0 _____
	* Grasses up to 15 cm or 6" tall -----	2 _____
	* Grasses 15 cm-30cm or 6"-12" -----	4 _____
	* Grasses greater than 30 cm or 12" -----	6 _____
	* Mosses -----	3 _____
	* Shrubs with leaves -----	3 _____
	with needles -----	4 _____
4. FIREWOOD OR FUEL STORAGE (e.g. propane tanks, oil tanks)		
	0 to 1m, or 0 to 3' from structure -----	5 _____
	1m to 9m, or 3' to 30' from structure -----	3 _____
	9m+, or 30'+ from structure -----	1 _____
5. BRUSH PILES		
	0 to 1m, or 0 to 3' from structure -----	6 _____
	1m to 9m, or 3' to 30' from structure -----	3 _____
	9m+, or 30'+ from structure -----	2 _____
6. GAS CANS, PAINT, ETC.		
	0 to 1m, or 0 to 3' from structure -----	3 _____
	1m to 9m, or 3' to 30' from structure -----	2 _____
	9m+, or 30'+ from structure -----	1 _____
7. OPEN BURNING PRACTICED -----		
		4 _____
8. NO BURN BARREL/INCINERATOR		
	OR NOT TO STANDARD -----	3 _____
9. OUTBUILDINGS WITHIN 6m or 20' OF STRUCTURE----		
		3 _____
TOTAL SITE HAZARD		_____

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B. STRUCTURAL HAZARDS

10. ROOFING MATERIALS

- * Metal, tile or fiberglass ----- 0 _____
- * Asphalt shingles/ rolled roofing ----- 3 _____
- * Wood (Cedar shingles) ----- 6 _____

11. FOUNDATION

- * Open ----- 5 _____
- * Enclosed with wood sheeting ----- 3 _____
- * Enclosed (Fireproof, i.e., concrete, metal) ----- 0 _____

12. EXTERIOR WALL MATERIALS

- * Brick / Stone / Metal ----- 0 _____
- * Vinyl / Wood ----- 4 _____

13. DECKS AND OVERHANGS

- * No ----- 0 _____
- * Yes ----- 4 _____

TOTAL STRUCTURAL HAZARD _____

HAZARD REDUCTION

(Select all responses that apply for sections 14 through 16)

14. SITE

- * Trees pruned up to 2 m or 6' ----- 2 _____
- * Lot cleared of brush within 9 m or 30' ----- 2 _____
- * Grass kept watered and short ----- 2 _____
- * Leaves/needles raked ----- 2 _____
- * 1 m or 3' of gravel or non-flammable
material adjacent to structure ----- 1 _____

15. STRUCTURE

- * Regularly cleaned roof ----- 2 _____
- * Non-flammable skirting on decks ----- 2 _____
- * Clear of flammable material
against structure ----- 2 _____

16. OTHER

- * Useable water supply nearby ----- 1 _____
- * Fire fighting equipment
- hose, ladder, shovel ----- 1 _____
- * Communication system (phone, radio) ----- 1 _____
- * Knowledge of fire reporting number ----- 1 _____
- * Burn barrel/incinerator to standard ----- 1 _____
- * Outbuildings hazard-free ----- 2 _____

TOTAL HAZARD REDUCTION _____

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FOREST HOME FIRE RISK CALCULATION

**TOTAL SITE HAZARD + TOTAL STRUCTURAL HAZARD - TOTAL HAZARD REDUCTION =
FOREST HOME FIRE RISK**

TOTAL SITE HAZARD -----	_____
+ TOTAL STRUCTURAL HAZARD -----	_____
- TOTAL HAZARD REDUCTION -----	_____
TOTAL FOREST HOME FIRE RISK	_____

Find your score on the chart that follows

HAZARD - is defined as the potential fire behavior based on physical fuel characteristics.
RISK - is defined as the probability of fire occurrence determined by the number, presence and activity of potential ignition sources.

This form is a short version of the Fire Hazard Assessment carried out by fire agencies. It covers about one-half of the hazards normally taken into account in calculating fire risk, but will provide an approximate indication of true risk. For more information on your forest home's fire risk, contact your local natural resources office or your municipal fire department.

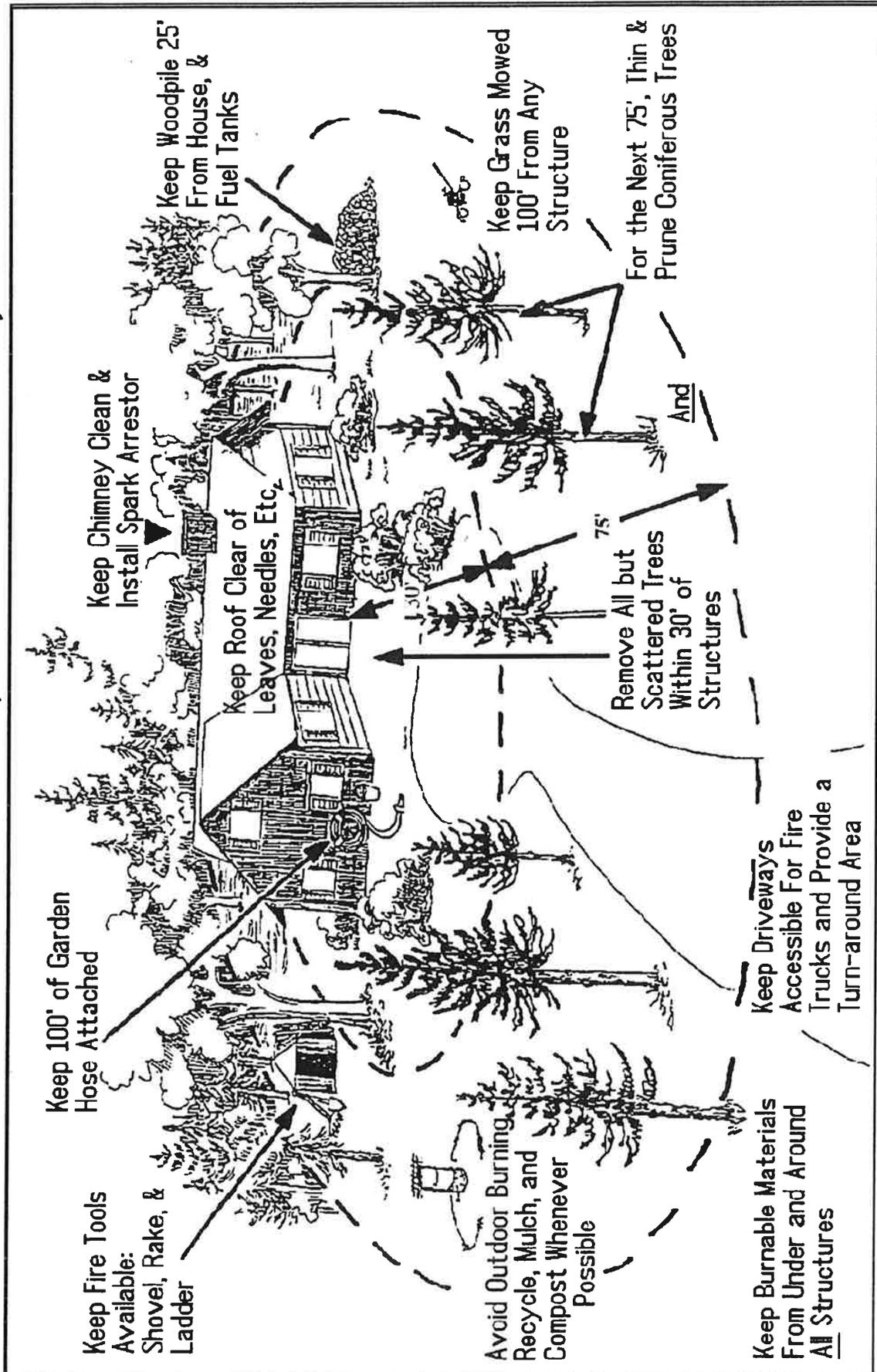
Measuring the Fire Risk of Your Home

Can your home survive a wildfire? Interpret your score below. After you identify the problems, plan to make improvements as soon as possible. For a more complete evaluation of your home, contact your local natural resources office or fire department.

Interpreting Your Score - Total Forest Home Fire Risk:

- 0 to 10 **LOW FIRE RISK.** The chances of your home surviving a wildfire are **GOOD**. You don't have to do much to improve your situation. Keep up the good work!
- 11 to 20 **MODERATE FIRE RISK.** The chances of your home surviving a wildfire are **FAIR**. Some minor improvements will make it even more fire resistant. Check the areas on the form in which you scored poorly.
- 21 to 40 **HIGH FIRE RISK.** The chances of your home surviving a wildfire are **NOT GOOD**. Improvements are necessary. Some improvements in structure and site are necessary.
- 41 to 60 **EXTREME FIRE RISK.** Your home **MAY NOT SURVIVE** if a wildfire passes through the area. In fact, a fire could even start on your property. Take a serious look at your property and make improvements. If you don't, you may be facing disaster. You'll find that even small changes could make the difference between losing or saving your home.

Is Your Home Safe From Wildfire?



Appendix F. Sample Fire Ordinance

Sample subdivision guidelines/ordinances for communities at risk taken from Virginia Department of Forestry at virginia.gov.

Wildfire Sensitive Areas

Sec. (###). Statement of intent.

Wildfire sensitive area requirements by this division are intended to protect the life, safety and general welfare of the citizenry and public safety officials and property and property values from the devastating effects of wildfires in the wildland/urban interface.

Sec. (###). Definitions.

1. Defensible Space is the area between improved property and a potential wildfire where fuels have been removed or modified to protect life and property from wildfire, to reduce the potential for fire from improved property spreading to wildland fuels, and to provide a safe working area for fire fighters protecting life and improved property.
2. Fuels are all combustible materials within the wildland/urban interface including trees, shrubs, plants, grass, rotting wood, leaves, and structures.
3. Fuel Load is the volume of fuel in any given area, generally expressed as tons per acre.
4. Fuel Modification is any manipulation or removal of fuels to reduce the likelihood of ignition or the resistance to fire control.
5. Ladder Fuels are fuels that provide vertical continuity allowing fire to carry from surface into the crowns of trees or shrubs with relative ease.
6. At Risk Wildfire Sensitive Areas are areas that have been identified by the Virginia Department of Forestry as moderate to high risk on their most recent wildfire risk analysis which may include any area one acre or larger in size that has highly flammable species such as cedar or pines, where 80% or more of all the dominant trees, at crown level, are made up of such conifer species. This includes pine stands and plantations. This may also include stands of predominately deciduous tree species where the impacts of terrain, slope and aspect combine for a substantial wildfire threat.
7. Wildland/Urban Interface is the area where structures and other human development meets or intermingles with wildland fuels.

Sec. (###). Applicability.

Any new subdivision or new construction in areas of the county defined by this division as wildfire sensitive areas shall comply with the requirements of this division. No provision of this section shall apply to timber stands or pine plantations that are managed for timber production, wildlife, hydrology, and/or recreation.

Sec. (###). Wildfire sensitive areas plan requirements.

In addition to the requirements of (### system)-(chapter that gives plat requirements) of this chapter, any new subdivision or new construction in wildfire sensitive areas shall include with the preliminary plat, a Wildfire Sensitive Area Plan consisting of a map legibly drawn at a scale of 100 feet to the inch on sheets that are in a size consistent with the preliminary plat detailing:

1. The defensible space around any proposed building site,
2. Areas to be cleared of non-fire resistive vegetation adjacent to proposed roads and driveways, and
3. Areas to be cleared of non-fire resistive vegetation adjacent to overhead power lines.

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Each individual lot purchaser shall be notified of the requirements of this section and the need to notify the Planning Department of amendments to the Wildfire sensitive area plan in the event that the location of any proposed structure or driveway is changed due to construction requirements.

Sec. (###). Defensible space.

Provisions of this section are intended to modify the fuel load so that the overall intensity of any wildfire is reduced through fuels control in areas adjacent to structures and improvements and to create a defensible space to provide a safe working area for fire fighters to protect life and improved property.

1. The defensible space area extends seventy (70) feet in all directions around any residential dwelling, or to property line, whichever is less.
2. Minimum Vegetative Clearance Requirements in defensible space:
 - a. No vegetation or woody growth is allowed within five (5) feet of any structure. Firewise ornamental vegetative fuels or cultivated ground cover, such as green grass, ivy, succulents or similar plants used as ground cover, are allowed provided they do not form a means of readily transmitting fire to any structure.
 - b. Tree crowns extending to within ten (10) feet of any structure shall be pruned to maintain a minimum horizontal distance of at least ten (10) feet.
 - c. Trees shall be pruned to remove limbs located less than six (6) feet above the ground surface.
 - d. Trees are allowed within the defensible space provided that there is space between the crowns that will preclude fire from traveling crown to crown. Horizontal distance between crowns of adjacent trees should be more than ten (10) feet.
3. Fuel Modification:
 - a. Any pine or cedar trees within twenty (20) feet of any residential dwelling shall be removed.
 - b. All dead trees within the defensible space shall be removed.
 - c. Vegetation and woody growth under trees shall be removed, or cut to a height that will preclude its functioning as a “ladder” for fire to travel from ground vegetation into the tree crown.
4. Liquefied Petroleum Gas Installations:
 - a. Above ground LP-gas containers shall be located within the defensible space.
 - b. No above ground propane tanks shall be installed or stored within five (5) feet of a structure.
 - c. No vegetation or woody growth is allowed within five (5) feet. Ornamental vegetative fuels or cultivated ground cover, such as green grass, ivy, succulents or similar plants used as ground cover, are allowed provided they do not form a means of readily transmitting fire to gas containers.
5. Roads:
 - a. Roads will be cleared of non fire-resistive vegetation growth not less than twenty (20) feet from each road edge that lies in a wildfire sensitive area.
 - b. All pine or cedar trees, dead trees, and dead woody material shall be removed from this area.
6. Driveways/Private Lanes:
 - a. Driveways and private lanes will be cleared of non fire-resistive vegetation growth not less than 10’ from each road edge.
 - b. All pine or cedar trees, dead trees, and dead woody material shall be removed from this area, except that;
 - c. Single specimens of trees (not pine or cedar), ornamental vegetative fuels or cultivated ground cover, such as green grass, ivy, succulents or similar plants used as ground cover need not be removed, provided they do not form a means of readily transmitting fire.

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7. Overhead Power lines:

- a. Overhead power lines will be cleared of non fire-resistive vegetation growth not less than 15' from each side of the outside edge of the power line that lies in a wildfire sensitive area.
- b. All pine or cedar trees, dead trees, and dead woody material shall be removed from this area.

Sec. (### system). Maintenance of defensible space.

Defensible spaces required by Section (### system)-(referring to Defensible Space Section above) shall be maintained in accordance with this section. Persons owning, leasing, controlling, operating or maintaining buildings or structures are responsible for maintenance of defensible spaces. Maintenance of defensible space shall include modifying or removing non fire-resistive vegetation and other dead vegetative material. In subdivisions, provisions for the maintenance of defensive space shall be included in the covenants, conditions and restrictions of the property.

1. Non fire-resistive vegetation or growth shall be kept clear of buildings or structures or improvements in accordance with Section (### system)-(referring to Defensible Space Section above) in such a manner as to provide a clear area for fire suppression operations and to modify the fuel load so that the overall intensity of any wildfire is reduced through fuels control. No firewood or other combustible materials may be stored within 5 feet of a structure.
2. Ladder fuels under trees within defined defensible space shall be maintained at a height that will preclude their functioning as a "ladder" for fire to travel from ground vegetation into the tree crown.
3. Tree crowns extending to within 10 feet of any structure shall be pruned to maintain a minimum horizontal clearance of 10 feet. Portions of tree crowns, which extend within ten (10) feet of outlet of a chimney, shall be pruned to maintain a minimum horizontal clearance of ten (10) feet. Deadwood and litter shall be regularly removed from trees. Dead trees shall be felled and removed.

Sec. (### system). Treatment to wildfire sensitive areas, fuel modification.

Notwithstanding the requirements in Section (### system)-(referring to Defensible Space Section above), fuels should be modified in the entire area where any new construction or new subdivision is going to be developed in a pine stand or pine plantation or wildfire sensitive area.

1. Woody debris from the thinning operation should be removed from the area or disposed of on site. All dead trees should be felled and if possible removed.
2. Note: If the pine stand is predominantly mature Virginia pine, it should not be thinned. The hazard of windthrow is high for thinned Virginia pine due to its shallow rooting system. Consult with the Virginia Department of Forestry for the best treatment to reduce wildfire hazard in this area.

Cross reference(s) -- Fire Protection, Sec. (### system); Fire Prevention and Protection, Sec. (### system).

Sec. (###). Fire protection.

The installation of adequate fire hydrants in a subdivision at locations approved by the agent shall be required, provided necessary public water is available. The agent shall consult with the proper authority before approving such location.

Where public water is not available, in consultation with the Emergency Services Coordinator, the developer shall be required to provide for the installation of a dry hydrant at a satisfactory water source within three miles of the proposed subdivision, if an existing dry hydrant is not available.

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Private lanes and driveways, dry hydrants.

Sec. (###). Streets and alleys.

Private lanes and driveways.

1. Private lanes and driveways shall provide a minimum unobstructed width of twelve (12) feet and, where practical, a minimum unobstructed clearance of thirteen feet six inches (13' 6").
2. Any private lane or driveway in excess of three hundred (300) feet in length shall be provided with turnarounds. Turnarounds shall be an all-weather road surface and shall have inside turning radii of not less than forty (40) feet, or as an alternative, a "hammerhead-T" turnaround (a "T"-shaped, three-point turnaround) that is no narrower than the road it serves. The top of the "T" shall be a minimum of forty (40) feet long.
3. Private lanes that connect with a road or roads at more than one point may be considered as having a turnaround if all changes of direction meet the radii or hammerhead-T requirements for turnarounds. The zoning administrator may permit modification of the turnaround requirements to an alternative that substantially accomplishes the intent of this division, to allow a public safety vehicle(s) to safely ingress and egress during a fire or public safety emergency.
4. Private lanes and driveways in excess of two hundred (200) feet in length and less than VDOT subdivision street standards in width shall be provided with turnouts in addition to turnarounds. Turnouts shall be spaced so that drivers can see from one turnout to the next where practical and will be installed at least every four hundred (400) feet, or at the midpoint if the private lane or driveway is between two hundred (200) and eight hundred (800) feet in length. Turnouts shall be an all-weather road surface at least 10 feet wide and 30 feet long.
5. All gates shall not open outward. Gate openings shall provide a clear opening of not less than two (2) feet wider than the traveled way.
6. Bridges shall be built to at least the width of the road and shall be capable of supporting at least twenty thousand (20,000) pounds per axle.
7. All plats describing lots served by private lanes and roads serving family divisions shall include language found in section (###).

Appendix G. Glossary of Terms (as defined in this plan)

Adaptive Management A structured, iterative process of optimal decision making in the face of uncertainty, with an aim to reducing uncertainty and improving effectiveness of actions over time via system monitoring.

Benefits Any positive value that contributes to the attainment of CWPP goals.

Containment The status of a wildfire suppression action signifying that a control line has been completed around the fire, and any associated spot fires, which can reasonably be expected to stop the fire's spread.

Crown Fire A fire that advances from top to top of trees or shrubs more or less independent of a surface fire.

Defensible Space An area typically with a width of 30 feet or more, between an improved property and a potential wildfire, where the combustibles have been removed or modified.

Dry Hydrant Permanent devices with fire engine threads attached to expedite drafting operations in locations where there are water sources suitable for use in fire suppression.

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Federally Threatened and Endangered Species As Identified by the Endangered Species Act, any species threatened with extinction, or endangered with extinction.

Fine Fuels Fast-drying dead or live fuels, characterized by comparatively high surface area-to-volume ratio, which are less than ¼ inch in diameter and have a timelag of one hour or less. They ignite rapidly and are consumed rapidly by fire when dry. Examples include grass, leaves, needles, etc).

Firebrand Any source of heat, natural or human made, capable of igniting wildland fuels. Flaming or glowing fuel particles that can be carried naturally by wind, convection currents, or by gravity into unburned fuels.

Fire-adapted Plants and vegetation communities which have evolved special traits that gives a species the ability to survive fires.

Fire Benefits Fire effects with positive monetary, social, or emotional value or that contribute, through changes in the resource base, to the attainment of organizational goals.

Fire Break A natural or constructed barrier used to stop or check fires that may occur, or to provide a control line from which to work.

Fire Damage Detrimental fire effects expressed in monetary or other units, including the unfavorable effects of fire-induced changes in the resource base on the attainment of organizational goals.

Fire-dependent Plants and vegetation communities which have evolved adaptations such as a reliance on fire as a disturbance agent, protection as a species against the effects of wildland fire, or even a strengthening or enhancement by it.

Fire Education Activities to change behaviors and attitudes about fire ecology, wildland fire and the role of fire in natural resource management. Defines the purposes for actions that provide information about and improve understanding of wildland fire.

Fire Management Activities required for the protection of burnable wildland values from fire and the use of prescribed fire to meet land management objectives.

Fire Preparedness Activities that are directed at preparing communities and fire departments to being better prepared for fire events.

Fire Protection Management objective to limit the adverse physical, environmental, social, political, and/or economic effects of fire.

Fire Regime Description of the patterns of fire occurrences, frequency, size, severity, and sometimes vegetation and fire effects as well, in a given area or ecosystem. A fire regime is a generalization based on fire histories at individual sites. Fire regimes can often be described as cycles because some parts of the histories usually get repeated, and the repetitions can be counted and measured, such as fire return interval.

Fire Regime Current Condition Class A qualitative measure classified into three classes describing the relative degree of departure from historical fire regimes, possibly resulting in alterations of key ecosystem components

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such as species composition, structural stage, stand age, canopy closure, and fuel loadings.

Fire Regime Groups A classification of fire regimes into a discrete number of categories based on frequency and severity. The national, coarse-scale classification of fire regime groups commonly used includes five groups: I - frequent (0-35 years), low severity; II - frequent (0-35 years), stand replacement severity; III - 35-100+ years, mixed severity; IV - 35-100+ years, stand replacement severity; and V - 200+ years, stand replacement severity.

Fire Resistant Tree A species with compact, resin-free, thick corky bark and less flammable foliage that has a relatively lower probability of being killed or scarred by a fire than a fire sensitive tree.

Fire Sensitive Tree A species with thin bark or highly flammable foliage that has a relatively greater probability of being killed or scarred by a fire.

Fire Severity Degree to which a site has been altered or disrupted by fire; loosely, a product of fire intensity and residence time.

FIREWISE The state of being knowledgeable and prepared for wildfire. A national program to educate communities on living safely in areas at risk of wildfire.

Firewise Construction The use of materials and systems in the design and construction of a building or structure to safeguard against the spread of fire within a building or structure and the spread of fire to or from buildings or structures to the wild land urban interface.

Firewise Landscaping Vegetative management that removes flammable fuels from around a structure to reduce exposure to radiant heat. The flammable fuels may be replaced with green lawn, gardens, certain individually spaced green, ornamental shrubs, individually spaced and pruned trees, decorative stone or other non-flammable or flame-resistant materials.

Forest Health A desired condition of forest ecosystems in which productivity of multiple resources, and ecological values including biodiversity, are resilient to disturbance and sustainable for the long-term.

Forest Resiliency Capacity of forests to respond to natural and human caused disturbance by resisting damage and recovering quickly.

Forest Restoration Establishing the composition, structure, pattern, and ecological processes necessary to make forest ecosystems sustainable, resilient, and healthy under current and future conditions. In many cases this means mimicking the forest structure and biodiversity that was historically present.

Fuel Any combustible material, especially petroleum-based products and wildland fuels.

Fuelbreak A natural or manmade change in fuel characteristics which affects fire behavior so that fires burning into them can be more readily controlled.

Ground Fuel All combustible materials below the surface litter, including duff, tree or shrub roots, punky wood, peat, and sawdust that normally support a glowing combustion without flame.

Hazardous Fuel A fuel complex defined by kind, arrangement, volume, condition, and location that presents a

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threat of ignition and resistance to control.

Hazardous Fuel Reduction Any treatment of living and dead fuels that reduces the potential spread or consequences of fire.

Healthy Forests See Forest Health

Home Assessment Evaluation of a dwelling and its immediate surroundings to determine its potential to escape damage by an approaching wildland fire. Includes the fuels and vegetation in the yard and adjacent to the structure, roof environment, decking and siding materials, prevailing winds, topography, fire history, etc., with the intent of mitigating fire hazards and risks.

Home Ignition Zone This area includes a house and its immediate surroundings within 100 to 150 feet. The condition of the home ignition zone principally determines the potential for home ignitions during a wildfire. A house burns because of its interrelationship with everything in its surrounding home ignition zone. To avoid a home ignition, the homeowner must eliminate a wildfire's potential relationship with his/her house. This can be accomplished by interrupting the natural path a fire takes---a relatively simple task. Flammable items such as dead vegetation must be removed from the area immediately around the house to prevent flames from contacting it. Also, reducing the volume of live vegetation will affect the intensity of the wildfire as it enters the home ignition zone.

Incident Objectives Site specific guidance and direction necessary for the selection of appropriate strategy(s) and the tactical direction of resources on an incident.

Initial Attack An aggressive action to put the fire out consistent with firefighter and public safety and values to be protected.

Initial Response Immediate decisions and actions taken to react to an ignition.

Integrated Fire Management As defined by the Nature Conservancy, is an approach to addressing the problems and issues posed by both damaging and beneficial fires within the context of the natural environments and socio-economic systems in which they occur, by evaluating and balancing the relative risks posed by fire with the beneficial or necessary ecological and economic roles that it may play in a given conservation area, landscape or region.

Ladder Fuel Vegetation that provides vertical continuity allowing fire to carry from surface vegetation into the crowns of trees or shrubs with relative ease.

Landfire An innovative wildland fire, ecosystem and fuel assessment-mapping project designed to generate comprehensive, landscape-scale maps of vegetation, fire and fuel characteristics for the United States using a consistent process nationwide.

Management Areas A specific geographic location on the Hiawatha National Forest, where specific management direction will be applied.

Mutual Aid Agreement An agreement between fire protection agencies that allows for either protection agency to

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help the other during wildfire mitigation or suppression.

Native Plants A term to describe plants endemic (indigenous) or naturalized to a given area or distributional range in geologic time.

Non-Native Plants A term to describe plants a species living outside its native distributional range. Many non-native plants can become invasive, causing ecological disruptions in natural areas.

Precautionary Principle states that if an action or policy has a suspected risk of causing harm to the public or to the environment, in the absence of scientific consensus that the action or policy is harmful, the burden of proof that it is not harmful falls on those taking the action.

Prescribed Fire Any fire ignited by management actions to meet specific objectives. A written, approved prescribed fire plan must exist, and NEPA requirements (where applicable) must be met, prior to ignition.

Project Area The geographic extent of the Eastern Delta CWPP which includes Bay De Noc, Ensign, Masonville, Nahma, and Garden Townships.

Regional Forester Sensitive Species As identified by the Regional Forester, aimed at avoiding trends toward federal listing and to maintain viability.

RxBurn See Prescribed Burn

Spotting Behavior of a fire producing sparks or embers that are carried by the wind and which start new fires beyond the zone of direct ignition by the main fire.

Structure Fire Fire originating in and burning any part or all of any building, shelter, or other structure.

Structural Triage A method of sorting structures into categories based upon defensibility from wildfire.

Suppression See Wildfire Suppression

Surface Fire Fire that burns loose debris on the surface, which includes dead branches, leaves, and low vegetation.

Value Any asset or other resource deemed important to the community, and worthy of protection from wildfire.

Wildfire An unplanned ignition caused by lightning, volcanoes, unauthorized, and accidental human-caused actions and escaped prescribed fires.

Wildfire Mitigation Action that moderates the severity of a fire hazard or risk.

Wildfire Risk The degree of potential risk to communities from wildfire.

Wildfire Suppression An appropriate management response to wildfire, escaped wildland fire use or prescribed fire that results in curtailment of fire spread and eliminates all identified threats from the particular fire.

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Wildland Fire Any non-structure fire that occurs in the vegetation and/or natural fuels.

Use of Wildland Fire Management of either wildfire or prescribed fire to meet resource objectives specified in Land/Resources management Plans.

Wildland Urban Interface (WUI) The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels

Appendix H. Glossary of Acronyms

AFG *Assistance to Firefighters Grant*

AGFP *Assistance to Firefighters Grant Program*

CWPP *Community Wildfire Protection Plan*

FEMA *Federal Emergency Management Agency*

FP & S *Fire Safety and Prevention*

GIS *Geographic Information System*

HFRA *Health Forests Restoration Act*

HNF *Hiawatha National Forest*

MDNR *Michigan Department of Natural Resources*

MSU *Michigan State University*

RNA *Research Natural Area*

SAFER *Staffing for Adequate Fire and Emergency Response*

USFS *United States Forest Service*

VFD *Volunteer Fire Department*

WUI *Wildland Urban Interface*

Appendix I. Resources and Acknowledgements

General Resources:

- Hiawatha National Forest-2006 Forest Plan
- Michigan State Forest Management Plan - April 10, 2008
- Delta County Hazard Mitigation Plan 2005
- National Cohesive Wildfire Management Strategy March 2011
- Review and Update of the 1995 Federal Wildland Fire Management Policy 2001
- Interagency Strategy for the Implementation of Federal Wildland Fire Management Policy 2003
- Community Guide to Preparing and Implementing a Community Wildfire Protection Plan 2008
- Preparing a Community Wildfire Protection Plan: A Handbook for Wildland–Urban Interface Communities (2004)

Internet Resources

Michigan DNR Fire Management

http://www.michigan.gov/dnr/0,4570,7-153-30301_30505_30816---,00.html

Michigan DNR-Wildfire: Are You and Your Home Prepared

http://www.michigan.gov/dnr/0,1607,7-153-30301_30505_30816-24040--,00.html

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Firewise Communities

<http://www.firewise.org/>

Conservation Gateway-Fire and Landscapes-The Nature Conservancy

<http://www.conservationgateway.org/topic/fire-landscapes>

California's Wildland-Urban Interface Code Information

http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland_codes.php

Local Wildfire Education Services Available

Contact your local MSU Extension Educator for education programs.

Mike Schira – MSU Extension

1500 Birch Street

Hancock, MI 49930

906-482-5830

schira@anr.msu.edu

Firewise education programming is available to address local needs:

- Homeowner training
- Homeowner/building/site evaluation
- Development and training on Firewise zoning
- Firewise public awareness enhancement.
- “Train the trainer” programs for local fire departments or emergency planners on the Firewise program.
- Assist communities in becoming identified as Firewise Communities

<http://www.firewise.org/Communities/USA-Recognition-Program.aspx>

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Evergreen Forestry (for use of ideas and language in Conservation Concepts and Principles)

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