

Crawford County



Adopted in 2019

Prepared for Beaver Creek, Frederic, Grayling, Lovells, Maple Forest, and South Branch Townships, Crawford County, City of Grayling, and Michigan National Guard in cooperation with the U.S. Forest Service and Michigan Department of Natural Resources.

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Crawford County 2019 Community Wildfire Protection Plan

The Crawford County Community Wildfire Protection Plan was developed under the planning guidance of the Healthy Forest Restoration Act of 2003. This plan represents a cooperative effort by local units of government, state and federal agencies and local organizations to improve preparedness for wildfire events in Crawford County while reducing wildfire risk factors.


Signatures of Acceptance

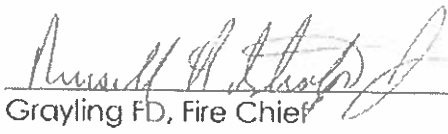

Crawford County Board of Commissioners
3-14-19
Date

 on behalf of Debbie Begalle
Michigan Department of Natural Resources Chief
7-26-19
Date



Huron Zone Fire Management Officer, USDA Forest Service
2/7/19
Date


Beaver Creek Township FD, Fire Chief
3/4/19
Date


Frederic Township FD, Fire Chief
2/14/2019
Date


Grayling FD, Fire Chief
2-14-19
Date


Lovells FD, Fire Chief
4/13/19
Date


South Branch FD, Fire Chief
Date

Chapter 1

Introduction

Location and Regional Setting

Crawford County is located in the north central Lower Peninsula of Michigan. The county is composed of six townships: Grayling Township, Frederic Township, Maple Forest Township, Lovells Township, South Branch Township, and Beaver Creek Township. Also, located in Crawford County is the City of Grayling, which is the county seat (**Figure 1.1**).

Crawford County is bordered on the east by Oscoda County, on the south by Roscommon County, on the west by Kalkaska County, and on the north by Otsego County. Crawford County has a land area of 563 square miles and a population of 14,273. Its population density is 25.4 people per square mile.

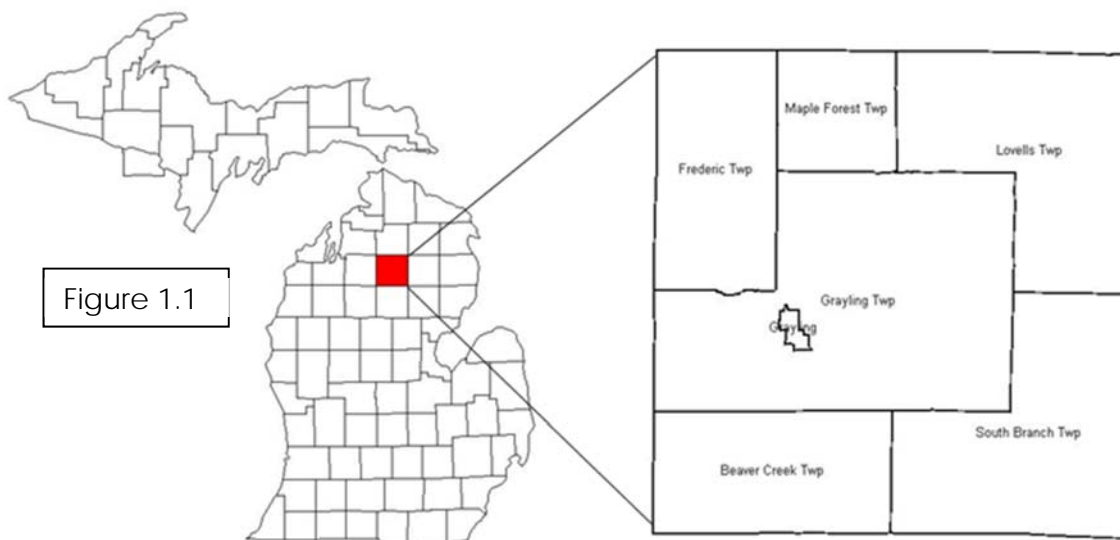


Figure 1.1

Summary of Wildfire Risks in Crawford County

Crawford County is dominated by high risk fuels such as jack pine, red pine, and oak forests. Combined with high ignition sources such as National Guard training exercises and recreational uses (camping, hiking, ORV's, canoeing and hunting), Crawford County contains one of the highest wildfire hazard areas in Michigan. In addition, high value infrastructure (residential areas, Camp Grayling facilities, oil and gas fields and National Guard ranges) are located in the Wildlands Urban Interface (WUI) and need to be protected from wildfires. Chapter 4 provides a risk and vulnerability assessment for communities in the County. The assessment evaluates fuels hazards, protection capability, ignition risk, fire history, values, and catastrophic fire potential. With the exception of Maple Forest Township, all of the communities have a high risk rating for

Community Wildfire Protection Plan

catastrophic fire potential. The composite compartment assessment rating found Grayling Township/City and South Branch Township to have high ratings. Beaver Creek and Lovells Townships have moderate ratings, while Frederic and Maple Forest Townships have low ratings. Other factors for the county considered for the plan were barriers for suppression such as the oil and gas fields and National Guard ranges, high ignition sources via National Guard training, and heavy recreational user interface related to camping, hiking, ORV's, canoeing, and hunting.

Planning Context

The National Fire Plan developed in 2001 and the Healthy Forests Restoration Act enacted in 2003 have enabled hundreds of communities across the US to develop community fire plans, engage in Firewise activities, and take action at a community level to reduce the risk to wildfire.

A Community Wildfire Protection Plan (CWPP) is a planning and prioritization process whereby communities establish local priorities to protect property and critical infrastructure from the risk of wildfire. Community Wildfire Protection Plans are community specific, with a rationale based on an analysis of current environmental and physical conditions. Plans may address issues such as wildfire response, hazard mitigation, community preparedness, and/or structure protection.

The benefits of having a Community Wildfire Protection Plan include access to funding resources such as the National Fire Plan, which provides millions of dollars annually to help states and communities with community fire planning, hazardous fuels reduction, and wildfire prevention across the nation. In addition, the United States Forest Service and the Bureau of Land Management may be able to expedite the implementation of fuel treatments identified in a Community Wildfire Protection Plan through alternative environmental compliance options offered under the Healthy Forests Restoration Act.

The purpose of the Healthy Forest Restoration Act of 2003 (HFRA) is to reduce the risk of wildfires while upholding environmental standards. It builds on existing efforts to restore healthy forest conditions near communities and essential community infrastructure by authorizing expedited environmental assessment, administrative appeals, and legal review for hazardous fuels projects on federal land. The Healthy Forest Restoration Act also defines a Community Wildfire Protection Plan and emphasizes the need for federal agencies to work collaboratively with local communities, states, tribes, and landowners in developing hazardous fuel reduction projects as identified by a Community Wildfire Protection Plan.

The minimum requirements for a Community Wildfire Protection Plan (CWPP) are:

1. Collaboration: A Community Wildfire Protection Plan must be collaboratively developed by local and state government representatives, in consultation with federal agencies and other interested parties.
2. Prioritized Fuel Reduction: A Community Wildfire Protection Plan must identify and prioritize areas for hazardous fuel reduction treatments and recommend the types

Community Wildfire Protection Plan

and methods of treatment that will protect one or more at-risk communities and essential infrastructure.

3. Treatment of Structural Ignitability: A Community Wildfire Protection Plan must recommend measures that homeowners and communities can take to reduce the ignitability of structures throughout the area addressed by the plan.

Planning Process

In late 2011, representatives from local, state, and federal government entities began meeting to develop a collaborative Crawford County Community Wildfire Protection Plan (CWPP). The Wildfire Planning Committee was assisted by the Northeast Michigan Council of Governments (NEMCOG) in developing the County's first CWPP. The Wildfire Planning Committee met several times during the planning process to review activities and draft plan sections. The County Board of Commissioners approved the plan on October 24, 2013. In turn, the plan was signed and accepted by the Fire Chiefs from each fire department, the Michigan Department of Natural Resource, and the US Forest Service.

The Crawford County Emergency Management office decided to update the CWPP in early 2018. After seeking funding to update the plan, the County requested NEMCOG's assistance to facilitate the update. Representatives from local, state and federal government entities met three times to review and amend the plan. The updated plan was approved and signed by the Crawford County Board of Commissioners on January 24, 2019. Subsequently, local municipalities, the Michigan Department of Natural Resources, and U.S. Forest Service approved and signed the plan.

Plan Summary

The purpose of the Crawford County Community Wildfire Protection Plan is to protect human life and reduce property loss due to catastrophic wildland fires in Crawford County. The Community Wildfire Protection Plan: 1) identifies and prioritizes Wildland/Urban Interface areas within Crawford County; 2) recommends strategies for hazardous fuels reduction treatments; 3) recommends local planning and zoning Firewise strategies communities can implement; and 4) outlines Firewise measures for reducing wildfire impacts to structures throughout Crawford County. The Crawford County CWPP is a supporting plan to the Crawford County Hazard Management Plan (Hazard Analysis and Hazard Mitigation Plan), which was approved by FEMA in 2005, and updated in 2014.

The Crawford County Community Wildfire Protection Plan was developed in accordance with requirements of HFRA. The plan first provides information on existing conditions such as population, housing, economic conditions, community services and facilities, and natural resources. Chapter 3 presents an audit of local planning and zoning activities. Based on criteria in the Firewise Program, an audit check list was developed for master plans, zoning ordinances, and stand-alone ordinances. The findings were used to develop recommendations and strategies.

Community Wildfire Protection Plan

The US Forest Service and Michigan DNR led the community risk assessment process utilizing the Risk Assessment and Mitigation Strategies (RAMS) planning process. This process utilizes the (RAMS) software, which is a landscape-level fire risk assessment tool that is used to identify areas that are of highest risk for loss of lives, property, and resource values by the threat of catastrophic fire. The outcome of the assessment is a composite risk ranking for specific geographic areas of the County accompanied by relevant information and maps that can be used to identify appropriate fire mitigation strategies and allocation of resources. Finally, the plan identifies treatment areas and priorities in and around the Wildland Urban Interface areas (WUI). Recommendations and strategies are included in the plan.

Community and individual landowner buy-in is critical to effectively implementing the CWPP. Community leaders can assist by promoting and adopting the recommendations and strategies of the “Firewise” program. Strategies include: “Firewise” education programs that target residents living in Wildland/Urban Interface areas and development guidelines that promote growth in a sustainable, hazard-free manner by incorporating Fire Mitigation Strategies into community zoning ordinances, land use planning, and building code standards.

Table 1.1 Crawford County Wildfire Committee	
<i>Name</i>	<i>Representing</i>
Shelley Pinkelman Dave Stephenson	Crawford County Board of Commissioners
Doug Pratt	Crawford County Emergency Management Frederic Township Fire Department
Doug Bourgeois	Beaver Creek Fire Department
Russell Strohpaal, Jr.	Grayling Fire Department
Lacey Stephan III	Grayling Township
Gary Lewicki	Lovells Township Fire Department
Tom Coors	Maple Forest Township
Phil Lewis	South Branch Township Fire Department
Mike Janisse	Michigan Department of Natural Resources
Kevin Marino	US Forest Service

Chapter 2

Existing Conditions

Population

The 2010 Census showed that Crawford County had a population of 14,074, which equated to a 1.4% decline in population from the 2000 US Census. Prior to this, Crawford County had experienced 30-year trend of population gains. Population is concentrated in the City of Grayling and Grayling Township with other small population centers located in South Branch, Beaver Creek and Frederic Townships.

Population by Municipality

Beaver Creek, Lovells, Maple Forest and South Branch Townships experienced population growth over the past decade. The City of Grayling, along with Frederic and Grayling Townships experienced population declines that resulted in the county as a whole showing a population loss over the past decade. **Table 2.1** shows population trends for communities in the County.

Table 2.1				
Population For Crawford County & Municipalities				
Municipality	2000 Population	2010 Population	Percent Change	Numeric Change
Beaver Creek Township	1,486	1,736	16.8%	250
Frederic Township	1,401	1,341	-4.3%	-60
Grayling Charter Township	6,516	5,827	-10.6%	-689
Lovells Township	578	626	8.3%	48
Maple Forest Township	498	653	31.1%	155
South Branch Township	1,842	2,007	9.0%	165
City of Grayling	1,952	1,884	-3.5%	-68
Crawford County	14,273	14,074	-1.4%	-199
Source: U.S. Bureau of the Census				

Seasonal Population

Obtaining accurate numbers of seasonal residents and tourists is difficult. Since the U.S. Census is conducted each decade in April, the numbers only reflect those persons who live in the county on a year-round basis. Tourism and annual events can provide large increases in population on any one weekend. The AuSable River Festival & Canoe Marathon in July can attract as many as 50,000 people to the area.

A rough estimate of the number of county seasonal residents can be calculated by multiplying the number of county seasonal housing units by the county's average number of persons per household. The 2010 Census showed there were 4,535 seasonal housing

Community Wildfire Protection Plan

units in the county and an average household size of 2.5 persons. Considering the additional influx of seasonal visitors or tourists staying in area motels, campgrounds, or family homes, a spike in population could exceed 10,000 persons during certain times. These spikes in populations should be acknowledged when identifying hazard mitigation strategies.

Age Distribution

According to the 2010 Census, Crawford County's year round population was 14,074 persons. This figure represents a loss of 197 persons or 1.4 percent from the 2000 Census. Even with the loss, the age group of 45 years and older gained population, increasing by 1,571 persons (26% increase). However, the county experienced losses in age groups that represent young families. Youth age group (19 years and younger) lost 703 persons (18.4% decrease) and the adult age group (25-44 years of age) declined by 1,073 persons (28.3% loss). See **Table 2.2** and **Figure 2.1**.

The median age of the County increased from 34.7 years in 1990 to 47.7 years in 2010. At the same time the State's median age increased from 32.5 to 38.9 years. During these two decades, the difference between median ages of the County and State increased from 2.2 years to 8.8 years, showing the County's population make-up is "aging" at the faster rate than the State of Michigan, **Figure 2.2**

In conclusion, long term trends in the County's demographic make-up indicate the median age will continue to increase at the faster rate than the State of Michigan and US. Furthermore, the rate of change was influenced by the downturn in the economy, as young families moved to other areas for employment. Since an aging population needs access to social and medical services, emergency response services will likely experience an increase in demands.

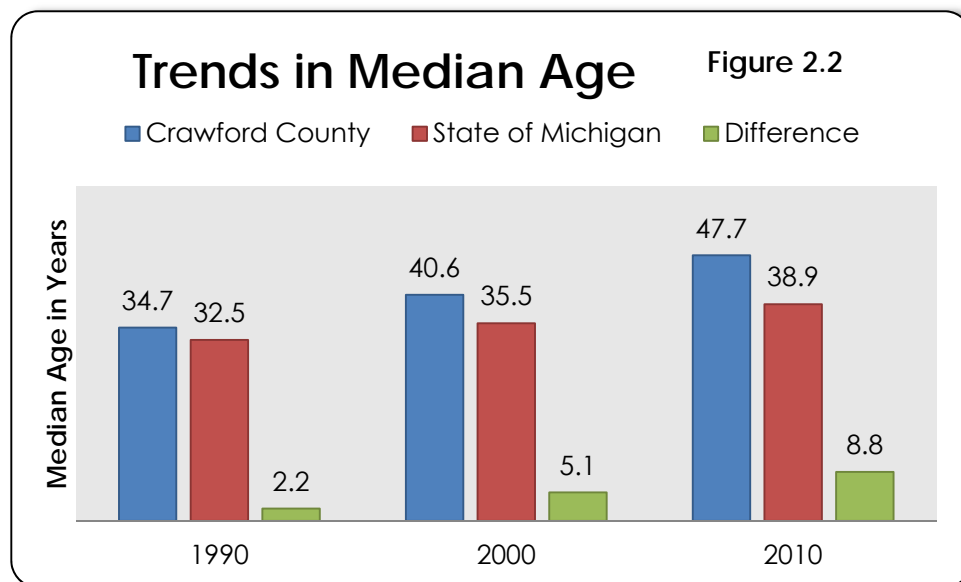
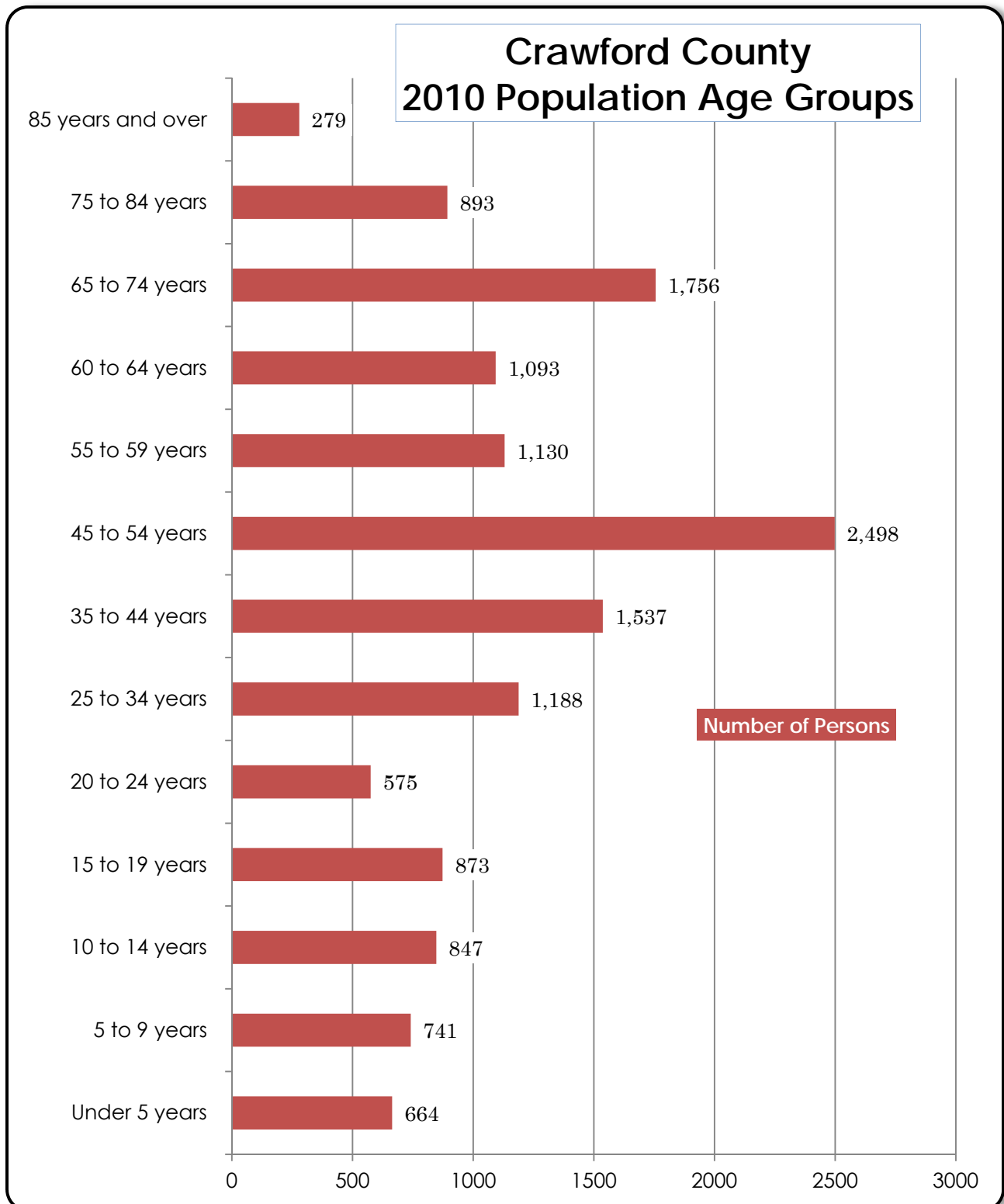


Figure 2.1



Community Wildfire Protection Plan

Table 2.2
Age Distribution By Community - 2010

MUNICIPALITY	< 5 Yrs.	%*	5-19 Yrs.	%*	20-24 Yrs.	%*	25-44 Yrs.	%*	45-64 Yrs.	%*	65 Yrs. & >	%*	Median Age
City of Grayling	124	6.6	385	20.4	118	6.3	450	23.9	417	22.1	390	20.8	38.6
Beaver Creek Township	67	3.9	330	19.0	67	3.9	317	18.3	601	34.7	354	20.3	47.8
Frederic Township	62	5.2	243	18.1	53	4.0	266	19.9	456	34.0	261	19.4	47.5
Grayling Charter Township	282	4.8	1019	17.5	241	4.1	1137	19.4	2009	34.6	1139	19.6	45.0
Lovells Township	14	2.2	63	10.0	14.0	2.2	71	11.4	258	41.2	206	32.9	57.5
Maple Forest Township	28	4.3	126	19.3	19	2.9	129	19.8	235	36.0	116	17.7	46.8
South Branch Township	87	4.3	295	14.7	63	3.1	355	17.7	745	37.1	462	23.0	50.8
Crawford Co.	664	4.7	2461	17.5	575	4.1	2725	19.3	4721	33.5	2928	20.8	47.7

*Figure shows the percentage each age grouping represents of the local unit's total population.
Source: U.S. Bureau of the Census

Housing Stock

Over past decades, Crawford County has experienced a steady increase in number housing units, with a high percentage used as seasonal housing. New housing starts drastically dropped in 2008 with the downturn in the U.S. economy.

Housing characteristics from the 2010 US Census are presented in **Table 2.3**. The Census found 11,092 housing units, with 6,016 units occupied and 5,076 units vacant. Grayling Township has the most housing units at 4,289 units (39% of the county total). As in many areas of northern Michigan, Crawford County has a large percentage of seasonal housing units- nearly 41 percent. Frederic, Lovells, and South Branch Township have percentages of seasonal housing units greater than 40 percent. The City of Grayling has a very low percentage of seasonal housing units (2.25%).

When conducting the hazard assessment for the CWPP, a critical step in the process is locating housing developments in relation to forest types and high risk wildfire areas. Parcel data and structure locations were provided by Crawford County. This data can be overlaid onto forest types and maps generated by the RAMS program. The results can be found in Chapter 4.

Community Wildfire Protection Plan

Table 2.3 Housing Counts and Occupancy Status in Crawford County						
Area Name	2010					
	Total	Occupied	Vacant	Percent Vacant	Seasonal	Percent Seasonal
Crawford County	11,092	6,016	5,076	45.8%	4,535	40.89%
Beaver Creek Township	1,317	733	584	44.3%	524	39.79%
Frederic Township	1,231	576	655	53.2%	586	47.60%
Grayling City	890	764	126	14.2%	20	2.25%
Grayling Township	4,289	2,464	1,825	42.6%	1,629	37.98%
Lovells Township	1,034	315	719	69.5%	694	67.12%
Maple Forest Township	470	263	207	44.0%	181	38.51%
South Branch Township	1,861	901	960	51.6%	901	48.41%
Source: US Census Bureau						

Economic Indicators

In Crawford County, 2010 Census data shows a loss in population levels over the last decade. Over the past decade the number of people in the labor force and employed has dropped. The unemployment rate has fluctuated greatly over the same time period, with current rate falling to 10.9%. . The County's employment was lower than the NEMCOG region's overall rate, but consistently higher than the state and US. The median household income has remained relatively stable, showing a small increase from 2010. Poverty rates have also increased slightly in recent years. See **Table 2.4**.

Table 2.4 Select Demographics and Economic Indicators			
Population (2010)	14,074	Median Household Income*	\$41,034
Civilian Labor Force*	5,854	Per Capita Income*	\$22,348
Employed*	5,188	Adults over 25 % Bachelor's Degrees*	10.8%
Unemployment Rate*	10.9%	Poverty Rate*	17.2%
US Census Bureau, American Community Survey, 2011-2016			

Community Services and Facilities

While the County encompasses 563 square miles, the majority of the population and infrastructure is concentrated in and around the City of Grayling and Grayling Charter Township. **Figure 2.4** is a map showing locations of community services and critical infrastructure within Crawford County. Adequate public and private infrastructure, facilities and services are essential elements of everyday life. A proactive approach to protecting community infrastructure and mitigating impacts from wildfires should be adopted. Costs to replace damaged facilities and infrastructure can be prohibitive and can be far greater than costs associated with implementing Firewise strategies.

County Government

The Crawford County Board of Commissioners meets on the fourth Thursday of each month, unless posted otherwise, at the County Building 200 W. Michigan Ave., Grayling, MI 49738. The County is represented by Seven Commissioners. Secretary to the Board is Sandra Moore 200 W. Michigan Ave., Grayling, MI 49738, (989)-344-3200.

County Commissioners

District 1- Laurie Jamison
 District 2 - Sharon Priebe
 District 3 - Shelley Pinkelman, Chair
 District 4 - Jamie McClain
 District 5 - Carey Jansen
 District 6 - Sherry Powers
 District 7 - Phil Lewis, Vice-Chair

County Controller Paul Compo 200 W. Michigan Ave., Grayling (989) 344-3202 pcompo@crawfordco.org Fax: (989) 348-5743	County Clerk/ Register Sandra Moore 200 W. Michigan Ave., Grayling (989) 344-3200 smoore@crawfordco.org Fax: (989) 344-3223
Treasurer Joseph Wakeley 200 W. Michigan Ave., Grayling (989) 344-3229 jwakeley@crawfordco.org Fax: (989) 344-3223	Sheriff Shawn Kraycs 200 W. Michigan Ave., Grayling (989) 344-3205 sheriff@crawfordsheriff.org Fax: (989) 348-6532 Jail Fax: (989) 344-8300
Emergency Services Doug Pratt 202 W. Michigan Ave., Grayling (989) 344-6821 emergencymanagement@crawfordco.org Fax: (989) 348-6351	Transit Authority Julee Dean 4276 W. N. Down River Rd (989) 348-8215 Grayling, 49738 Fax: (989) 348-6631
Environ. Monitoring Paul Compo 200 W. Michigan Ave., Grayling	MSU Extension Service Mischelle Warner 501 Norway St, Ste. 2, Grayling

Community Wildfire Protection Plan

(989) 344-3202 Fax: (989) 344-3258	(989) 344-3264 Fax: (989) 344-3265
Conservation Dist. Chair Walt Neilson PO Box 156, Roscommon, 48653 (989) 275-5231	District 10 Health Department Kevin Hughes 501 Norway St., Grayling, 49738 (989) 348-7800
Housing Commission Hannalore Dysinger W. Michigan Ave., Grayling, 49738 (989) 344-3284 (989) 344-3222	

Minor Civil Divisions

Crawford County has six townships along with the City of Grayling.

Beaver Creek Township, 8888 S. Grayling Rd, Grayling, MI 49738, (989) 275-8878

Frederic Township, 6470 Manistee St, PO Box 78 Frederic, MI 49733, (989) 348-8778

Grayling Charter Township, 2090 Viking Way, PO Box 521 Grayling, MI 49738, (989) 348-4361

Lovells Township, 8405 Twin Bridge Rd., Grayling, MI 49738, (989) 348-9215

Maple Forest Township, 2520 W. Marker Rd., Grayling, 49738 (989) 348-5794

South Branch Township, 5245 M-18, P.O. Box 606, Roscommon, MI 48653, (989) 275-8232

City of Grayling, 1020 City Blvd., P.O. Box 549, Grayling, Michigan 49738, (989) 348-2131

Law Enforcement

Crawford County has two local law enforcement agencies: the Sheriff's Office, located at 200 W. Michigan Avenue in Grayling and the Grayling Public Safety, Police Division located at 1020 City Blvd. in Grayling. The County 911 system is a separate county function and is co-located in the Sheriff Department. Crawford County is patrolled by Michigan State Police Troopers assigned to the Houghton Lake Post and the Kalkaska Detachment. There are troopers assigned to Crawford County that start and end their shifts at the Michigan State Police Crime Lab located on the I-75 business loop in Grayling. Camp Grayling will provide some law enforcement to Crawford County if needed.

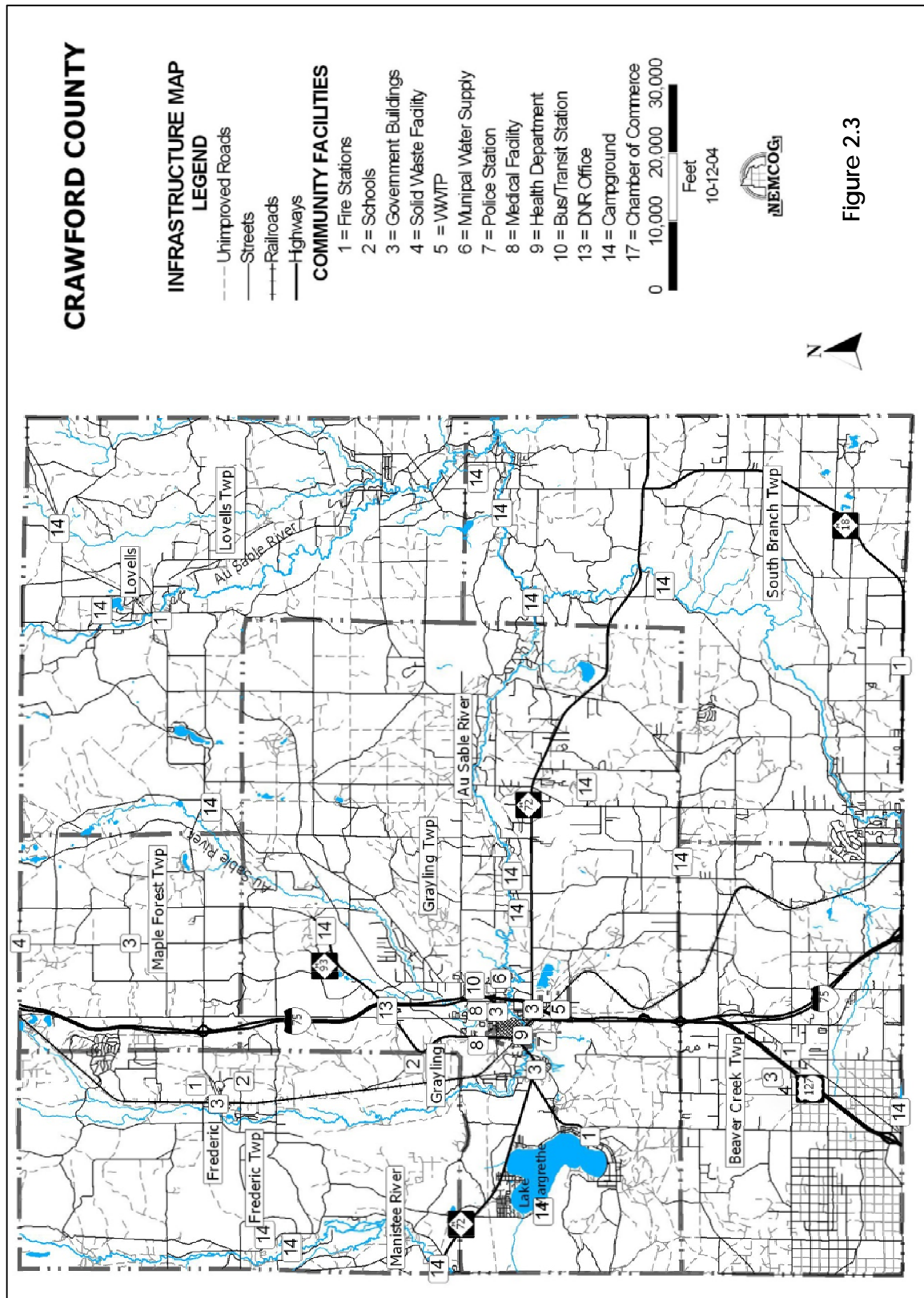


Figure 2.3

Community Wildfire Protection Plan

Emergency Medical Services

Crawford County maintains Emergency Medical Services (EMS) throughout the county. Mobile Medical Response (MMR) units are located in Beaver Creek Township and the City of Grayling. South Branch Township and Frederic Township maintain local Emergency Medical Services (EMS).

Fire and Emergency Services

Crawford County has five community fire departments providing fire protection to all areas of the County. In addition, Camp Grayling has one fire department that provides fire supersession on firing ranges. **Table 2.5** provides a summary of fire and emergency services.

Frederic Township Fire Department (FTFD), is a paid fire department covering 108 square miles for Fire, and 486 square miles for EMS. FTFD provides fire protection for approximately 2,096 people and approximately 7,974 people for EMS. It is located at 6547 Frederic St., Frederic, MI and a substation at 6565 County Road 612 NE Kalkaska, MI 49646. The operating budget is \$1,200,000. The Frederic FD provides fire and emergency medical services to Maple Forest Township in addition to only providing EMS coverage to the following townships: Lovells Township, South Branch Township (for intercepts only) and in Kalkaska County, Blue Lake Township, Bear Lake Township, Coldsprings, and Excelsior Township. The mailing address is PO Box 79, Frederic, MI 49733. Phone (989) 348-8190.

Grayling City-Township FD, a partially paid fire department covering 180 square miles, and providing fire protection for approximately 7,554 people. It is located on 1041 City Blvd., Grayling, MI. The mailing address is 1041 City Blvd., Grayling, MI 49738. Phone (989) 348-6319. The operating budget is \$250,000. Medical response is provided by MMR. Water sources are located at Pollack Bridge, Euclid Bridge/Portage Creek, Stephan Bridge, Wakeley Bridge, Wilcox Bridge, and Lake Margrethe ½ mile west of Danish Landing Rd.

Lovells Township FD, a volunteer fire department covering 108 square miles, and providing fire protection for approximately 626 people. It is located on 8405 Twin Bridge Rd., Grayling, MI. The mailing address is 8405 Twin Bridge Rd., Grayling, MI 49738. Phone (989) 348-9215. The Lovells Township FD provides fire and first responder services township-wide. The annual budget for both the fire fighters and first responders is \$96,425. The water sources are the lakes in the Township.

South Branch Township FD, a combined full time and partially paid fire department covering 108 square miles, and providing fire protection for approximately 2,000 people. It is located on 5245 N. M-18 Roscommon, MI. The mailing address is 5245 N. M-18, PO Box 606, Roscommon, MI 48653. Phone (989) 275-4779. Annual Fire Budget: \$269,000. The Township also provides ambulance protection within the Fire Department with an annual budget of \$97,500.

Community Wildfire Protection Plan

Beaver Creek FD, a partially paid fire department covering 72 square miles, and providing fire protection for approximately 2,000 people. It is located on 8972 S. Grayling Rd., Grayling, MI. The mailing address is 8972 S. Grayling Rd., Grayling, MI 49738. Phone (989) 275-8548. The current operating budget for the Fire Department is \$407,977. Mobile Medical Response operates in Crawford County with their primary station located in the City of Grayling and uses this station as a full time satellite station.

Camp Grayling: The Grayling City-Township Fire Department provides structural fire suppression at Camp Grayling. Camp Grayling has a seasonal crew for first response on wildfire suppression from March to November.

DNR Grayling Field Office is located on 1955 Hartwick Pines Rd., Grayling, MI 49738. Phone: (989) 348-6371. The northern two-thirds of the county is covered out of the Grayling field office.

DNR Roscommon Field Office is located at 8717 North Roscommon Rd, Roscommon. The southern third of the county is covered out of the Roscommon Field Office.

Water Sources for Fire Suppression

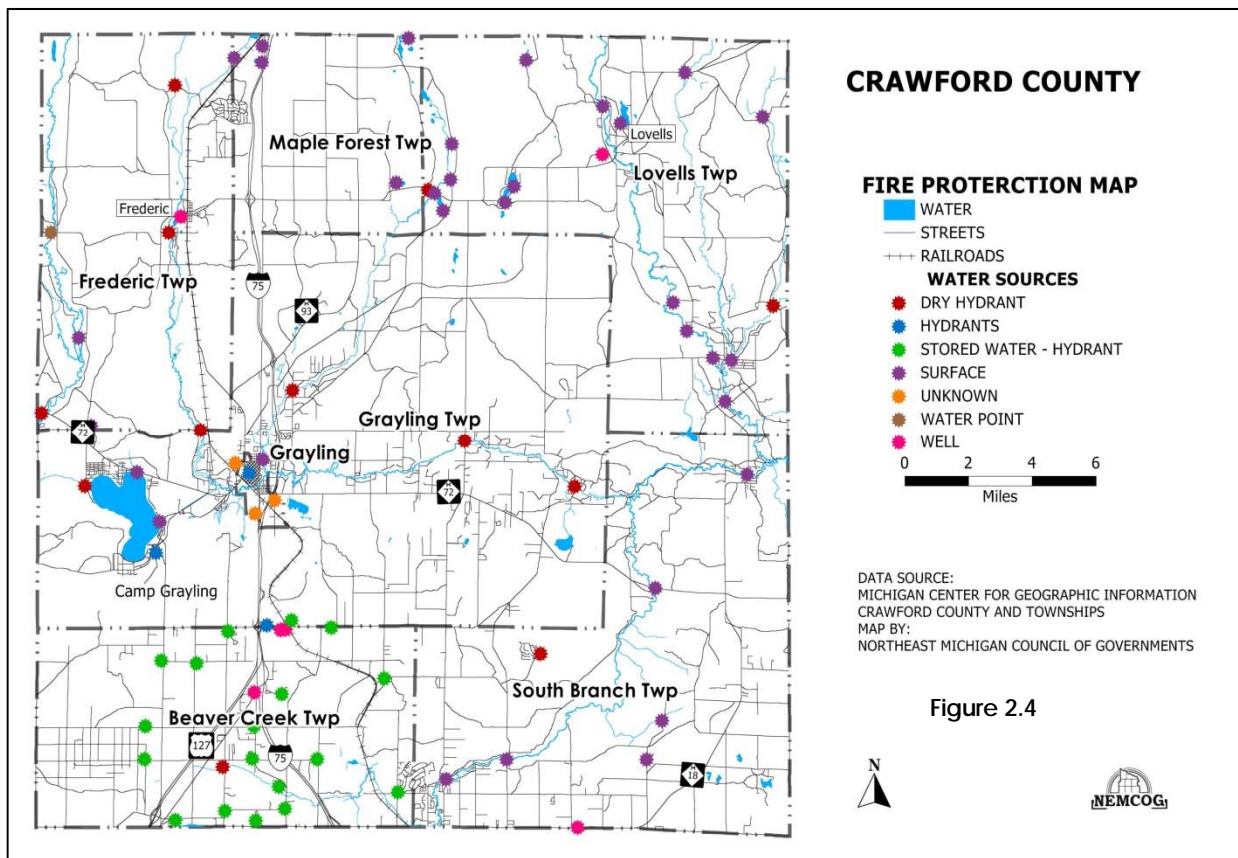
Outside the City of Grayling, fire departments must rely on water tenders to fight structural fires and wildfires. In rural areas access to water sources such as dry hydrants needs to be strategically located to minimize travel times. A key factor in locating water supply sites is proximity to population areas. In some cases, location is merely driven by easy access to surface waters such as river crossings. Community fire departments supplied maps with locations of developed water sources. Those sites were encoded into a geographic information system and used to develop a Water Supply Map of the county, see **Figure 2.4**.

Medical Facilities

Munson Healthcare Grayling, an 81-bed hospital that serves residents and visitors to Crawford, Roscommon, and Oscoda counties, is located at 1100 E. Michigan Avenue, Grayling, MI 49738. The hospital's emergency department triages and treats trauma patients and others with emergency needs. The hospital also serves the Camp Grayling National Guard training center. Military and law enforcement personnel train year-round and about 200 camp attendees are treated in the hospital's Emergency Department each year. Troop Medical Clinic is located at Camp Grayling. The clinic is fully staffed during troop training, but reduces staff numbers during other times.

District Health Department #10 addresses a range of health care needs of the community. The Crawford County Branch is located at 501 Norway Street Suite # 1 Grayling, MI 49738. Programs offered by the Health Department fall under three categories: home health care services, environmental health services, and personal health services. Northern Lakes Community Mental Health of Traverse City provides support services to developmentally disabled persons as well as persons needing mental health services, Phone: (231) 922-4850.

Community Wildfire Protection Plan



Public Water Supply

The Department of Environmental Quality (DEQ) has primary enforcement authority in Michigan for the Federal Safe Drinking Water Act under the Michigan Safe Drinking Water Act. The DEQ has regulatory oversight for all public water supplies including approximately 1,500 community and 11,000 non-community water supplies. The program also regulates drinking water well drilling for approximately 25,000 new domestic wells drilled each year. Like most of northern Michigan, Crawford County's only source of drinking water is groundwater. Public water supply for the County is summarized below:

Private Wells: Most of Crawford County's land area is served by private wells and nearly 2,645 of these wells supply water to County residents. If drinking water comes from a private well, the owner is responsible for the water's safety. EPA rules do not apply to private wells, but the agency recommends that well owners have their water tested annually.

Community Water Systems: Community water systems serve the population year-round, such as in private residences or businesses. There are five active community water systems in Crawford County, serving a total of 2,776 people. This figure includes the City of Grayling community system, which supplies drinking water to 1,952 City residents and is maintained by the City of Grayling Department of Public Works.

Community Wildfire Protection Plan

Table 2.5 Crawford County Fire Departments				
Name	Type	Coverage (Sq. miles)	Population	Equipment/Staff
Frederic & Maple Forest Township Frederic Township Fire Department 6547 Frederic St., Frederic	Paid and Paid on Call Fire EMS Coverage	108 486	2,096 7,974	Staff: 18 full time and 20 paid on call members Equipment: 152 Brush Truck 121 Engine 1500 GPM with 1,000 gallons of water 122 Engine/Rescue 1250 Pump/750 gallons of water 131 tanker of 3,000 gallons 1 ORV with a 50 gallon tank of water 2 Snowmobile Rescue Units 1 Heavy Rescue/Hazmat 6 Basic to Advanced Life support ambulances 1 Mobile Command Trailer 1 Mass Casualty Trailer 1 CERT Trailer
Grayling City-Township 1041 City Blvd., Grayling	Partially-paid	180	8,000	Staff/Volunteers: 21 Equipment: Truck #220 – 2,000 Gallon Type 1 Tanker/Pumper Truck #223 – Type 1 Engine, 2 Person Cab Truck #224 – Type 1 Engine, 5 Person Cab, Jaws/Ice Rescue Truck #230 – 2,000 Gallon Type 1 Tanker Truck #242 – Medical Assist Vehicle, Personal Transport Truck #250 – Water Point Type, 275 GPM Trash Pump Truck #251 – 75' Type 1 Aerial/Engine, Jaws Command Truck - Tahoe
Lovells Township Twin Bridge Rd., Lovells Twp.	Volunteer	108	626	Volunteers: 15 Equipment: One Small (on a Ford F-550 chassis) Fire Truck One Large Fire Truck

Community Wildfire Protection Plan

				One (3,000 gallon capacity) Pumper Truck One vehicle assigned solely to medical response missions
South Branch Township M-18 Hwy., Roscommon	Combined Full Time / Partially-paid	108	2,001	Staff: 2 Full time Fire Fighter / EMTs and 17 Paid on-call firefighters, 2 Paramedics, 10 EMT-B, 1 MFR Equipment: 1250 Gal. Main Engine 1250 Gal. Engine/2000 Gal. Tender 500 Gal. Tender/2000 Gal. 2000 Gal. Tender Water Point Truck Command Unit Light Brush Truck 300 Gal. 6X6 5 Ton Wild Fire Truck 6X6 2 ½ Ton Wild Fire Truck Basic Ambulance
Beaver Creek Grayling Rd., Beaver Creek Twp.	Combination	72	2,000	Staff and volunteers: The Department has four full time Responders and an additional nine Paid On Call employees Equipment: Unit 720 is a 1250 gpm / 1000 gallon Class A Apparatus Unit 722 is a 1250 gpm / 1000 gallon Class A Apparatus Unit 730 is a 500 gpm / 2000 gallon Tender Unit 740 is a Rescue vehicle Equipped with Medical First Response, and used to pull the Snowmobile rescue trailer Grass Truck, 200 gal, 50 GPM, 4 wheel Drive 750 is a Ford E350 15 seat van used as the command vehicle and used to tow the confined space trailer
Grayling DNR Field Office 1955 Hartwick Pines Rd.	Paid	North 2/3 Crawford	NA	Staff at Grayling 1 Fire Supervisor 2 fulltime Fire Officers 4 fire line qualified firefighters Equipment: 2- Tractor-plows 1- Skidgine (Skidder) with 500gal of water and plow unit

Community Wildfire Protection Plan

				3- Large water units 1- small water unit
Roscommon DNR Field Office 8717 North Roscommon Rd.	Paid	South 1/3 Crawford	NA	1 Fire Supervisor 2- full-time Fire Officers 2- fire line qualified firefighters Equipment: 1-Tractor plow 2 large water units 1 small water units
Source: NEMCOG				

Utility Services

Due to the large amount of public land, utility services are lacking in some areas of the County. DTE provides natural gas service to parts of the County. Frontier and AT&T provide telephone service to the largest geographic area of the County. However, there are pockets of unserved areas in the county. Consumer Energy and Great Lakes Energy provide electricity to the developed areas within the County.

The City of Grayling Department of Public Works provides water and sewer services to the City of Grayling. Residents and business owners in the remainder of the County must rely on on-site private wells for domestic drinking water needs and private on-site septic systems for wastewater disposal. District Health Department #10, regulates and maintains a permitting system for private wells and septic systems.

Schools

Most of Crawford County is within the Crawford AuSable School District located on 1135 N. Old US 27, Grayling, MI 49738. South Branch Township and a portion of Beaver Creek Township are located in the Roscommon Area Public School District located at 702 Lake St., Roscommon, MI 48653. **Table 2.6** provides a summary of school districts and schools servicing Crawford County.

Special Populations

Nursing homes and adult foster care facilities have residents with special medical needs. Additionally, evacuation of residents from larger facilities presents challenges. As a result, when planning for wildfire protection it is important to identify the location and needs of these facilities. See **Table 2.7**

Camp Grayling

Camp Grayling is an important component of the Crawford County community landscape. Camp Grayling, with its 147,000 acres, is the nation's largest National Guard training facility. This state owned and operated facility accommodates a wide variety of training opportunities ranging from small arms to heavy artillery. It is home to a "state of the art" Multi-Purpose Range Complex (MPRC) and a Maneuver Area Training Equipment Site (MATES) facility that houses a number of different types of military equipment. **Figure 2.5** shows lands under Camp Grayling's jurisdiction.

Community Wildfire Protection Plan

Table 2.6 Crawford County Schools		
Crawford AuSable School District		
School Name	Address	Students and Staff
Grayling Elementary-AuSable Primary School Phone: (989) 344-3604	306 Plum St. Grayling, MI 49738	Students: 693 Teachers: 45
Grayling Middle School Phone: (989) 344-3558	500 Spruce St. Grayling, MI 49738	Students: 348 Teachers: 23
Grayling High School-Adult Ed Phone: (989) 344-3508	1135 N. Old-27 Grayling, MI 49738	Students: 486 Teachers: 28
Roscommon Area Public Schools		
School Name	Address	Students and Staff
Roscommon Elementary School (989) 275-6610	175 W. Sunset Dr. Roscommon, MI 48653	Students: 259 Teachers: 19
Roscommon Middle School Phone: (989) 275-6640	299H W. Sunset Dr. Roscommon, MI 48653	Students: 326 Teachers: 18
Roscommon High School Phone: (989) 275-6675	10600 Oakwood Dr. Roscommon, MI 48653	Students: 449 Teachers: 24
Other Schools		
School Name	Address	Students and Staff
Grayling Adventist Elementary School Phone: (989) 348-2501	2468 Camp Au sable Rd Grayling, MI 49738	Students: 9 Teachers: 1
Sources: SchoolDigger.com and privateschoolreview.com		

Table 2.7 Special Populations		
Nursing Homes		
Name	Address	Information
Grayling Nursing Centre	331 Meadows Drive Grayling, MI 49738	Beds: 120 Staff: 50
Mercy Hospital-Grayling LTCU	1100 Michigan Ave. Grayling, MI 49738	Beds: 40 Staff: 600
Adult Foster Care/Assisted Living Facilities		
Name	Address	Information
AuSable License Type: Small Group	1086 AuSable Trail Grayling, MI 49738	Capacity: 6 Staff: 1-2
Jones Lake Home License Type: Small Group	PO Box 2909, 3464 Jones Lake Grayling, MI 49738	Capacity: 6 Staff: 1-2
Wargos Manor License Type: Medium Group	808 Chestnut Grayling, MI 49738	Capacity: 12 Staff: 1-2
The Brook	503 Rose St. Grayling, MI 49738	Capacity: 24 Apartments Staff: 10
Source: NEMCOG		

Training is conducted all year round with active and reserve units of the Army, Navy, Air Force, and Marine Corps all making use of Camp Grayling's unique combination of

Community Wildfire Protection Plan

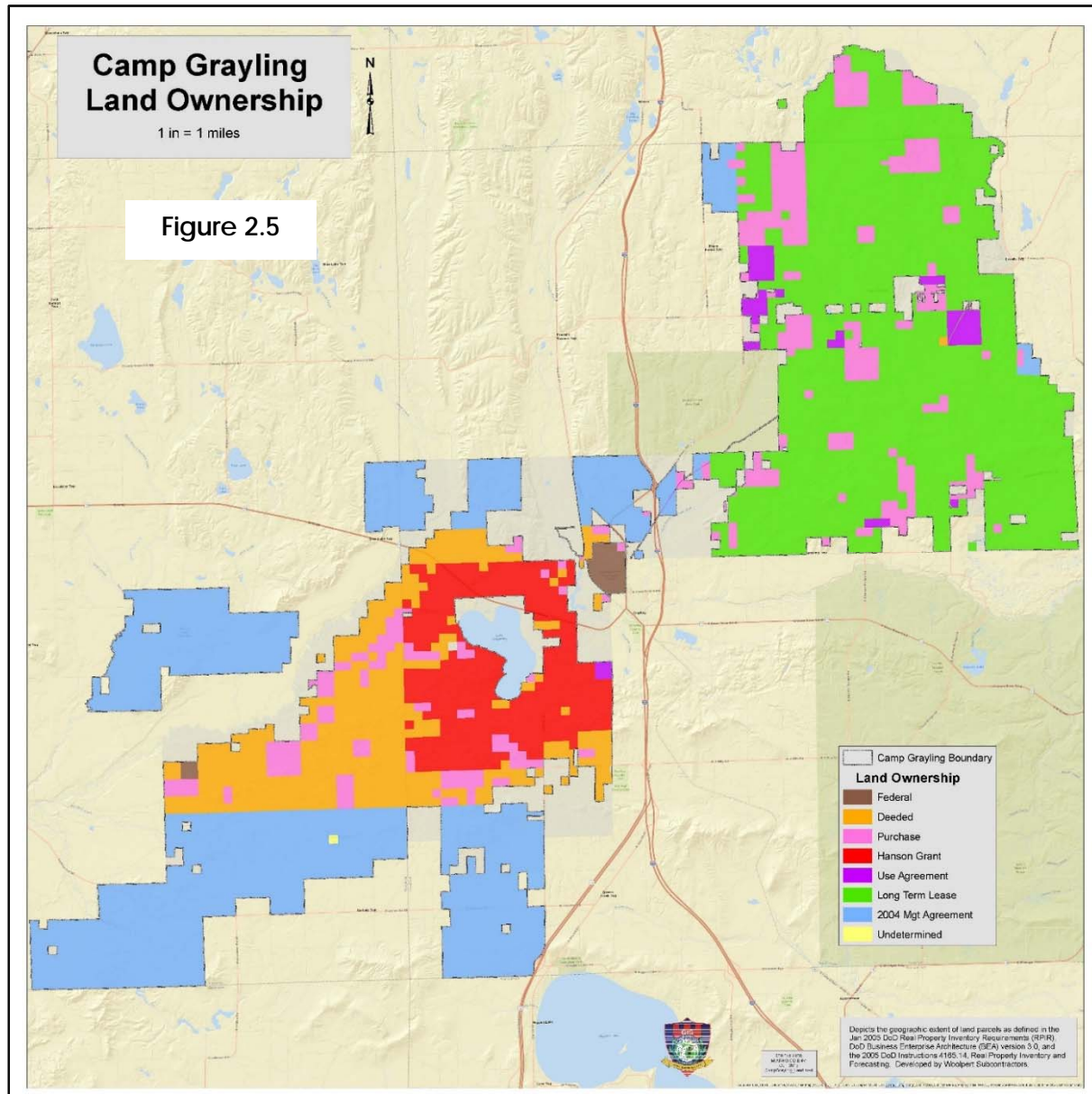
training resources. Training at Camp Grayling focuses on assisting any training unit an area or range to complete their required training. Camp Grayling also hosts a large number of law enforcement and first responders throughout the training cycle.

Camp Grayling has approximately 8,000 transient bed spaces, with 3,921 beds in heated billets and 4,079 beds being in unheated billets located at both the main installation grounds and the Grayling Army Airfield. In addition, tents are available to include GP large, GP medium and GP small, along with five 10-man and thirty 4-man Arctic tents with capability of housing 6,780 personnel. Total housing capacity is 13,649 personnel. There are fifteen battalion and higher headquarter buildings for administrative and supply support needs. The camp has an Ammunition Supply Point (ASP) on post, which can store every type of munition in the U.S. Army's inventory. Bulk fuel sites are operational providing JP-8 and diesel fuels. Seven vehicle buildings with a total of 14 bays can be utilized for maintenance support.

The installation also operates a Multi-Purpose Range Complex (MPRC), also known as the Range 30 complex for tank, TOW, door gunneries, and infantry assaults with automated target scenarios. At the Range 30 complex the weapons systems that can be fired include the MLRS/HIMARS and some tank gunnery tables with the ability for tracked and wheeled vehicle maneuver areas. Other training areas in the vicinity of the Range 30 complex are: the miller drop zone, the Combined Arms Collective Training Facility (CACTF), and the MATES facility. To coincide with all the range assets is maneuver land for training tactics.

The Air to Ground, also known as the Range 40 Complex, includes an air-to-ground bombing range and an artillery range. The Range 40 complex can conduct air-to-ground munitions delivery for fixed wing aircraft with drops up to 500 pounds. Helicopter door gunnery and anti-armor gunneries are also conducted at the Range 40 complex along the firing of the AT-4, Javelin and TOW Inert, along with the M2 50 caliber Machine Gun.

The Grayling Army Airfield has 60 helipad tie down areas, an air traffic control tower, a flight operations center, a cantonment Area, VOR/NDB/VASI/REIL, a hangar facility, and a runway lighting system. The South (Main Camp) is the post headquarters, with housing/barracks areas, ARF range, combat pistol range, shotgun/MG ranges, mortar range, demolition range, LANES training areas, maneuver training areas, and an NBC gas chamber.



Roads and Highways

The transportation system in Crawford County is depicted in **Figure 2.6**. Interstate 75 is the major north-south highway in Crawford County, and goes through the City of Grayling. Crawford County's major east-west route is M-72, which also goes through the City of Grayling.

Other major roads include US-127 that runs north-south and connects with I-75 in Beaver Creek Township. M-18 runs north-south on the eastern edge of Crawford County and connects with M-72. County Road 612 runs east-west along the northern portion of the County connecting the communities of Frederic and Lovells. Old-27 parallels I-75 through Crawford County and connects the communities of Frederic and the City of Grayling. Other County Primary roads include North Down River Road, W. 4 Mile Road, E. Pere

Community Wildfire Protection Plan

Cheney Road, W. Fletcher Road, Chase Bridge Road, S. Military Road, S. McMaster Bridge Road, Lovells Road, N. Sherman Road, County Road 502, Old 144 Road, N. Higgins Lake Road, Grayling Road, Manistee River Road, and Twin Bridge Road.

Public Transportation

The Crawford County Transportation Authority (CCTA) is the only transit service available in Crawford County. It services the City of Grayling and Crawford County with 26 employees operating 17 vehicles. CCTA is located on 4276 W. North Down River, Grayling, MI 49738, See **Table 2.8** for system profile.

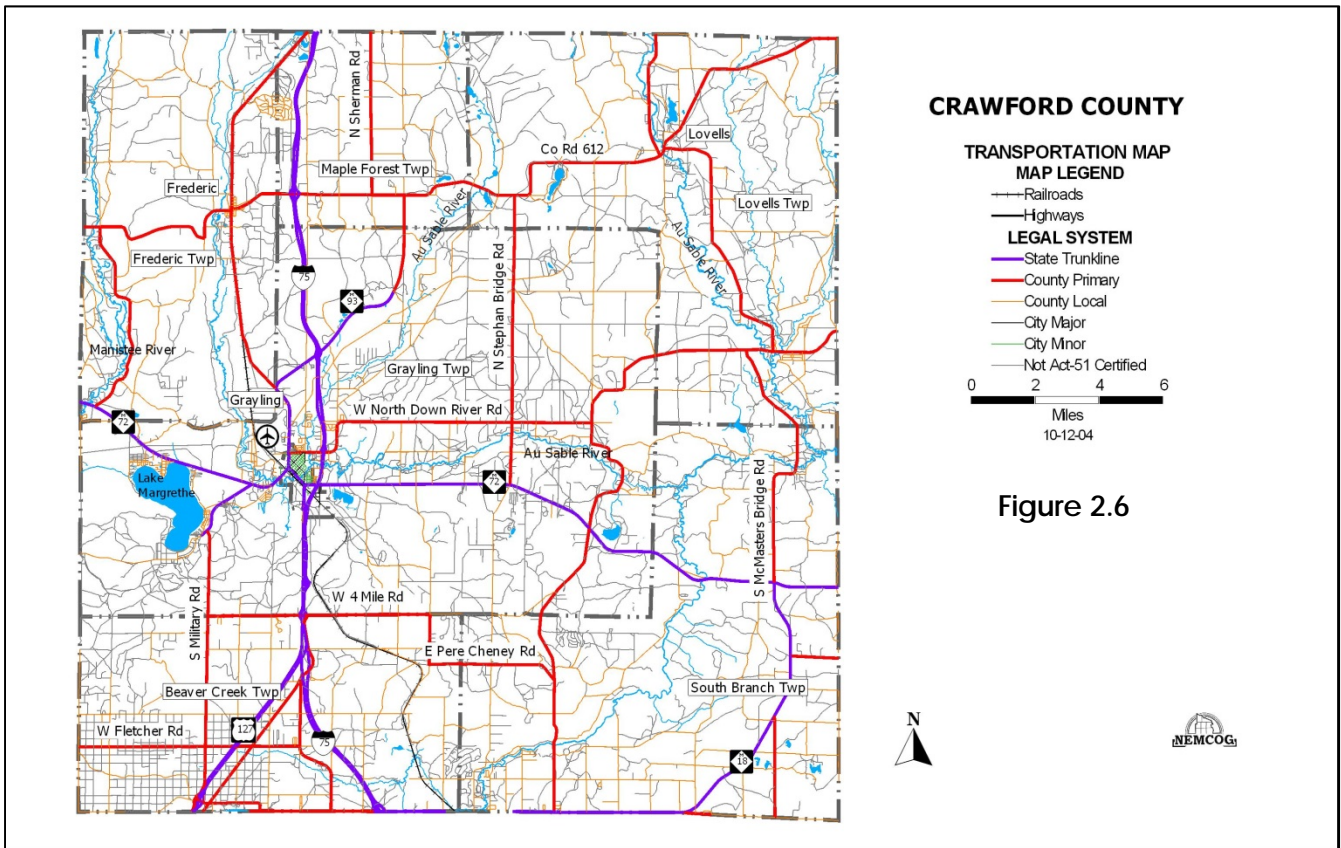
Table 2.8 Transit System Profile	
The Crawford County Transportation Authority has been providing safe, dependable transit services to the citizens of Crawford County and the City of Grayling since 1976. It is one of the first countywide systems in Michigan. The system prides itself on providing an extremely high level of service to a relatively low, sparsely populated county, which results in a high per capita level of ridership.	
System Characteristics	
Days/Hours of Operations:	M-F 6:00 a.m. - 6:00 p.m.
Total vehicles:	17
Lift-equipped vehicles:	16
Population Served:	14,074
Employees:	26
FY 2016 System Data	
Miles:	445,864
Vehicle Hours:	24,687
Passengers:	95,284
Total Eligible Expenses:	\$1,431,919
Source: Michigan Department of Transportation	

Rail Service

An active railroad runs 29 miles north-south across the western parts of the County. Lake State Railway Company (LSRC) currently operates their Mackinac Subdivision, which runs parallel to Michigan's I-75 corridor between Bay City and Gaylord. New spur sidings at 4 Mile Road are used to store chemicals related to forest products industries.

Airports

The Grayling AAF Airport is a multiple runway airport located on the Grayling Army Airfield and is the only airport in Crawford County. This airport is owned and operated by the U.S. Government and serves the City of Grayling and Crawford County.



Environment

Overview

The greatest attraction for the residents and visitors of northern Michigan is the area's environment and rural character. Recreational activities such as hunting, fishing, golfing, snowmobiling, boating, hiking and biking attract people from urban areas of Michigan, as well as from other states. Many long time visitors have chosen to move to northern Michigan upon retirement. Because of the abundant outdoor recreation opportunities, the natural environment is a major economic base and income generator.

Climate

Typical of northern Michigan, Crawford County experiences long, snowy, cold winters; and moderately warm summers are separated by a cool, green spring and a cool, colorful fall. Located in the north central part of the northern Lower Peninsula, the County is approximately 65 miles inland from Lake Michigan and Lake Huron. Given this geographic location, with the exception of lake effect snowfall, the weather is not significantly influenced by the lake moderating effect of both Great Lakes.

Community Wildfire Protection Plan

According to the US Climate Data.com the average annual precipitation is 33.58 inches (includes water equivalent of snowfall). Precipitation is heaviest during the summer months with 62 percent of the annual precipitation from April through September. The average annual snowfall is 105 inches. Records from the USDA show that for a long term average of 127 days or 1/3 of the year, there is at least one inch of snow on the ground. Of course, the number of days varies greatly from year to year. Soil moisture replenishment during the fall and winter months plays an important role in plant growth whether farm crops or forest plants. While drought occurs periodically, the Palmer Drought Index indicated drought conditions reached extreme severity only 2% of the time.

The average daily high temperature ranges from 80 °F for the month of July to 26 °F during January. The average mid-afternoon relative humidity is 63 percent. Since humidity levels are highest at night, the average relative humidity at dawn is 85 percent. The warmest days occur in the month of July with a monthly average high temperature of 80 °F. Temperatures over 100 degrees have been recorded in the months of June, July, August and September and temperatures in the high 80's have occurred as early as March and as late as October. Normal temperatures for the area range from the high 70's to the low 50's in the summer and from the high 20's to single digits in the winter. See **Table 2.9**.

Table 2.9 Temperature, Snowfall and Precipitation Data for Crawford County												
Category	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average high in °F	26	29	39	53	66	76	80	77	69	56	42	30
Average low in °F:	8	8	15	29	39	49	54	52	44	34	25	16
Average snowfall inches	30	22	13	4	0	0	0	0	0	1	9	26
Average precip. inches	1.61	1.3	1.69	2.76	3.27	3.7	3.58	3.78	3.74	3.78	2.6	1.77
Source: US Climate Data.com												

Topography

Most of the county is nearly level or gently rolling. Local differences in elevation are slight, in a few places exceeding 100 feet, although the hills and plateau like ridges appear to rise above adjacent sand plains when viewed from a distance. Slopes of hilly land are both long and expansive or, where the relief is choppy, smooth and rounded. There are no steep slopes except along watercourses.

The northern part of the county consists of three broad highland plateaus having a general north-south direction, three complementary broad sand valleys, and a wide sandy plain on the east. The central part, from eastern to western boundaries, is a wide level sand plain through which the Au Sable River and its tributaries have cut narrow shallow trenches. Several detached swells or ridges, irregular in outline but having general east to west trends, characterize the southern part of the county. Here the general relief is

Community Wildfire Protection Plan

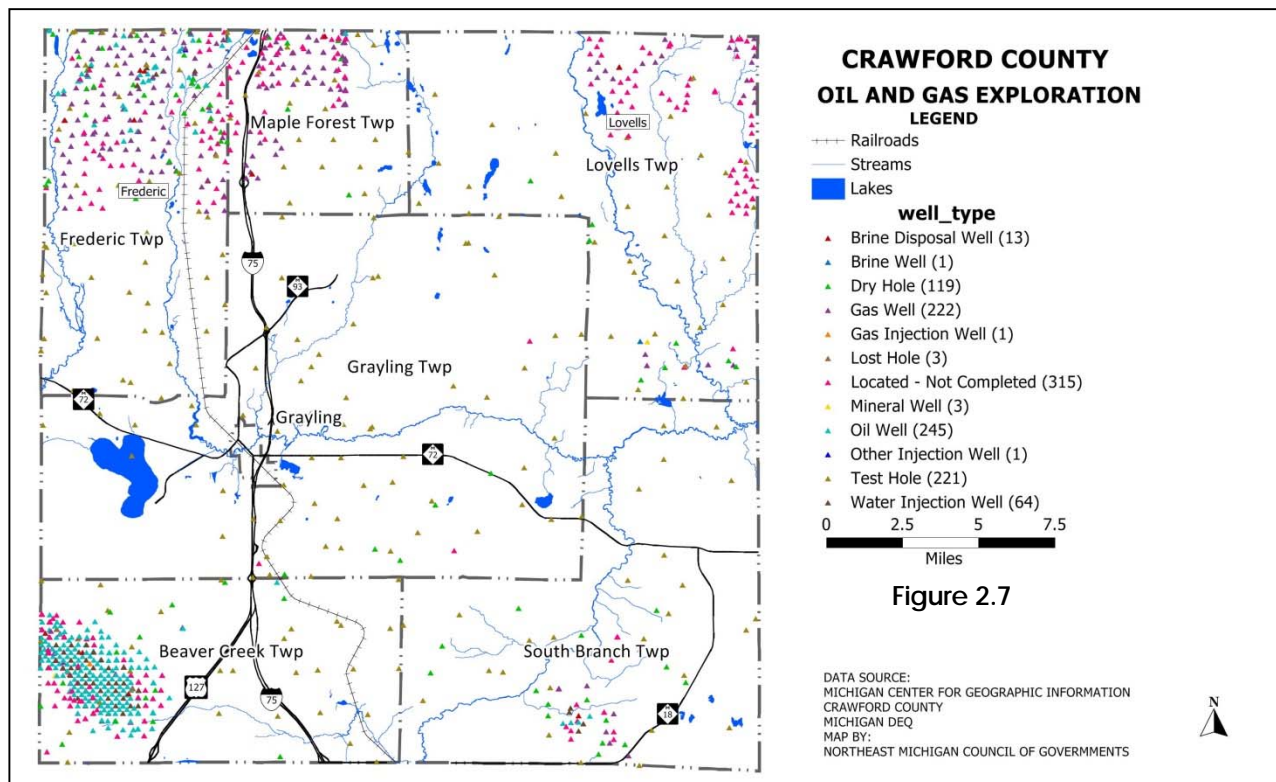
gently rolling or moderately hilly. Level sand plain and swamps intervene between masses of higher land.

Geology

Two main bedrock formations underlie Crawford County. The northern part of the county is underlain by bedrock of the Napoleon Formation. This formation is composed of 50 to 100 feet of white and light gray sandstone of late Mississippian age. The southern part of the county is underlain by the slightly younger Michigan formation, also of late Mississippian age. This formation is composed of interbedded layers shale sandstone and limestone and is as much as 500 feet thick. These two formations are covered by glacial drift ranging from 600 to 800 feet thick in the northern part of the county to less than 200 feet thick in the southern part. The bedrock formations contain deposits of gas and oil which are being exploited. **Figure 2.7** is a map that shows locations of wells that are color-coded to show well types. **Table 2.10** shows wells by status. As can be seen, there are concentrations of wells in western Beaver Creek Township, northern Frederic and Maple Forest Townships, south-central South Branch Township, and northeastern Lovells Township. Deep deposits of gas and oil are being explored and extracted with fracking techniques.

Surface geology is directly related to the advancing and retreating glaciers of thousands of years ago. The surface geology of Crawford County consists of moraines, till plains and outwash plains. Moraines are linear hilly ridges that represent the former position of a glaciers edge and are made up of unconsolidated sand, gravel, rock, and clay. Moraines are found south of Grayling running east to west and three moraines that trend north and south are found just north of Grayling. Till plains are the level areas between moraines and consist of unconsolidated sand, gravel, rock, and clay. Outwash plains are water-laid deposits formed from the melting glacier consisting of stratified deposits of sand, gravel, rock, and clay. The only outwash plain in the county is located in Beaver Creek and South Branch Townships.

Table 2.10 Oil and Gas Wells in Crawford County	
Well Type	Number
Brine Disposal Well	13
Dry Hole	119
Gas Well	222
Brine Well	1
Lost Hole	3
Location only - not yet completed	315
Mineral Well	3
Oil Well	223
Test Hole	221
Water Injection Well	64
Source: Michigan DEQ 2018	



Soils

When planning for types and intensity of land uses, soil types and slopes are two important factors that determine the carrying capacity of land. Additionally, knowledge of the location of excessively drained soils will assist in identifying wildfire prone areas. Soil types influence the location of plant communities that grow in the county. Pine forests, particularly jack pine, are adapted to grow on sandy, draughty soils. While northern hardwood forests thrive on sandy loam soils and cedar forests prefer mucky, wet soils.

The Natural Resource Conservation Service completed a detailed soil survey of Crawford County. A digital or computerized version of the soil survey was acquired from the Michigan Center for Geographic Information and used to analyze soil conditions and generate color thematic soil maps.

Hydric Soils and Steeply Sloped Areas

Figure 2.8 is a map that classifies hydric soils and soil units with slopes 18% and greater. The hydric soils (colored green on the map) are mainly located adjacent to streams and creeks. This connectivity of riparian wetlands and surface water features can be seen throughout the landscape. Areas colored light brown are soils with small areas of hydric inclusions (areas too small to be delineated from the primary soil types). Hydric soils have high water tables and will not support heavy equipment. These areas can be barriers when deploying fire suppression equipment. Hills and steeply rolling terrain may provide

Community Wildfire Protection Plan

opportunities for spectacular views of the landscape. However, steeply sloped areas influence fire behavior and are difficult to access when fighting wildfires. Areas with slopes 18 percent or greater are colored red on the map.

Soil Drainage Class

Figure 2.9 is a map that classifies soil drainage classes. "Drainage class (natural)" refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized: excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual." – Natural Resource Conservation Service.

Excessively drained and somewhat excessively drained sandy soils support vegetation that can tolerate draughty conditions. Jack, red and white pine, northern pin, red and white oak, bigtooth and quaking aspen, paper birch, and red maple are common. Jack pine and northern pin oak are most common on the sandy excessively drained soils. Plants produce ample amounts of fuels, and during spring months and other dry times of the year conditions are conducive to wildfires.

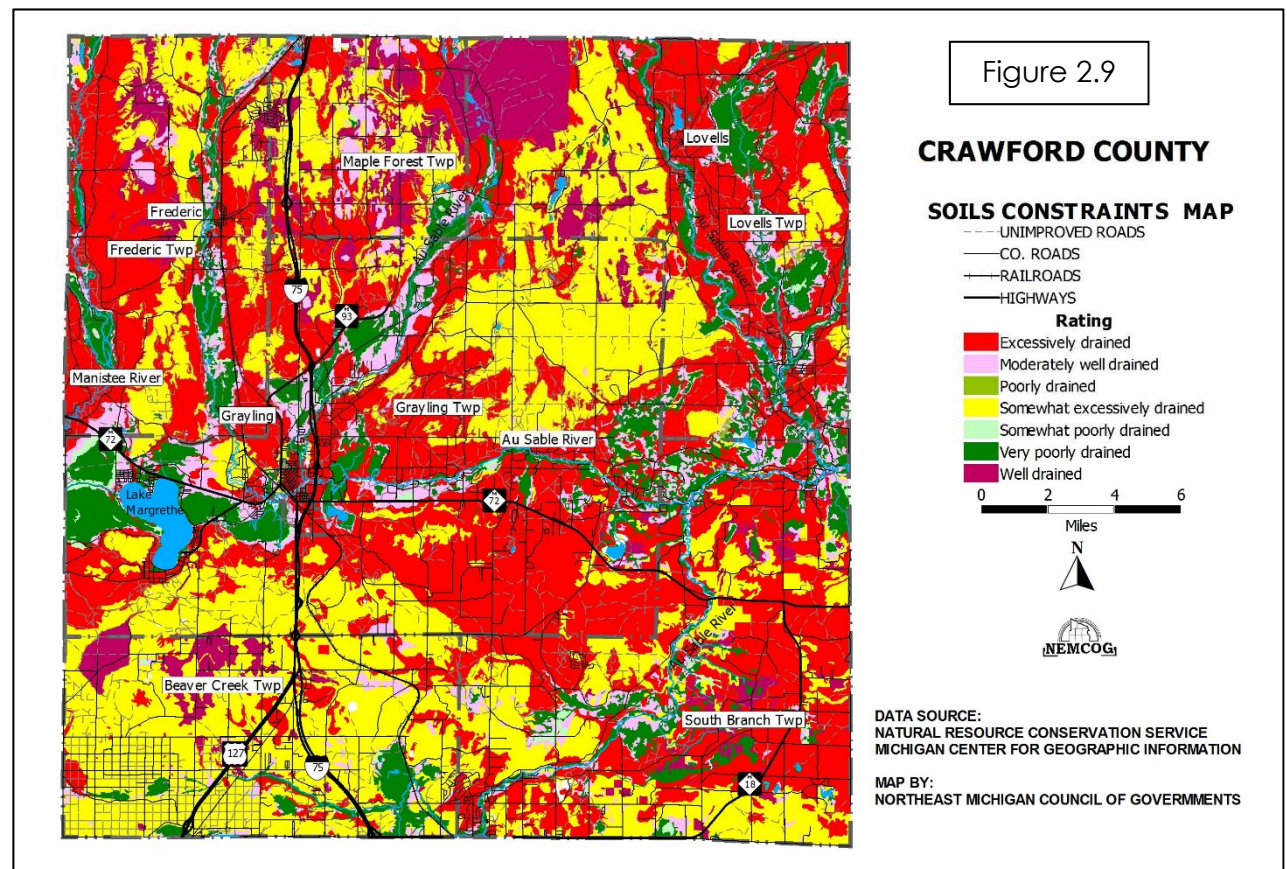
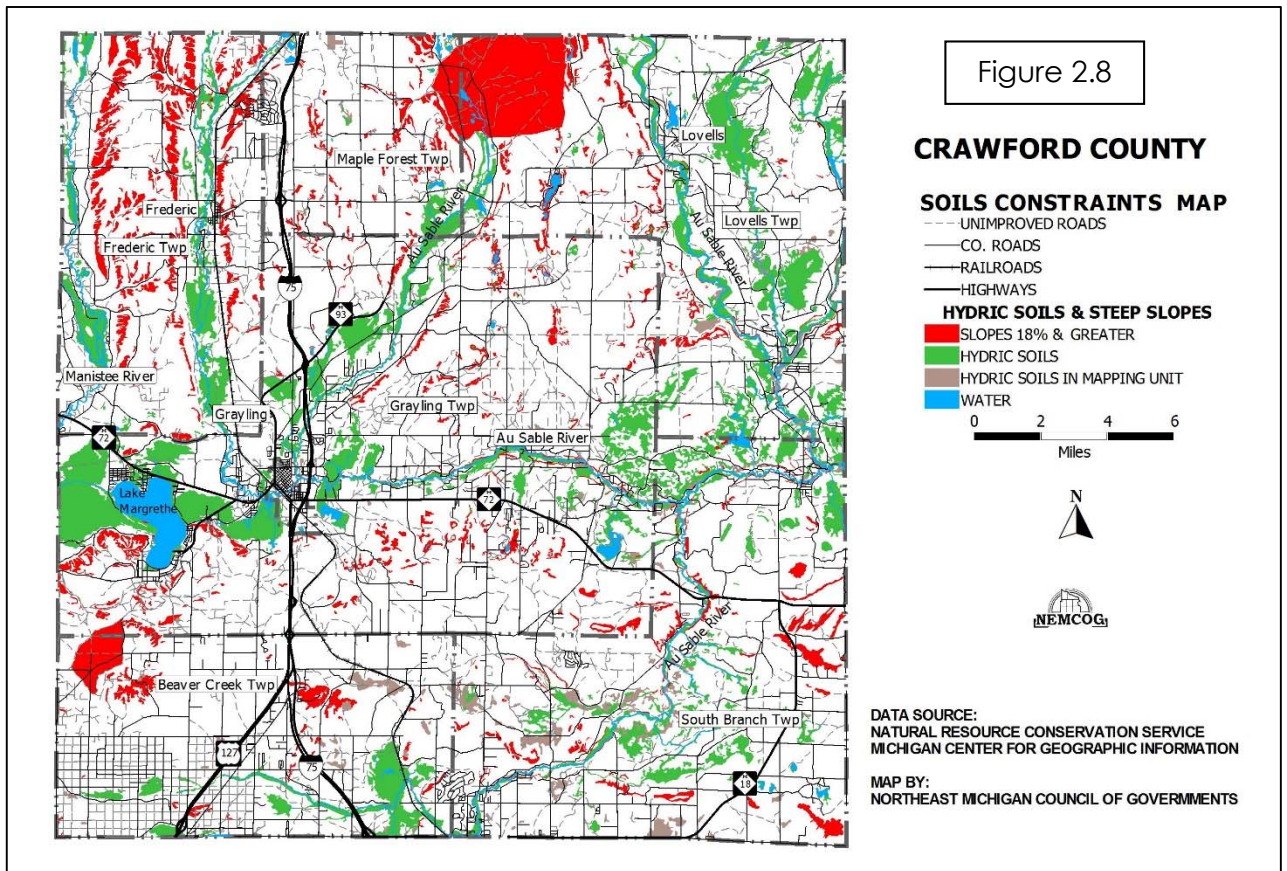
Water Resources

Crawford County has an abundance of lakes and streams. The has a total of 53 lakes that are 1 acre or larger. The largest body of water in the county is Lake Margrethe in Grayling Township with a surface area of 1,928 acres, an average depth of 16 feet, and a maximum depth of 65 feet. Seven lakes are over 100 acres. The large majority of the lakes are less than 50 acres in size. The county is predominantly within the Au Sable River water shed. The Manistee River drains the western portions of the county. There are 45 miles of inland shoreline in Crawford County with approximately 25 miles open to the public. Almost all of the lakes and streams provide good fishing and many tourists come to the county to fish. Lake Margrethe is at the headwaters of the Manistee River Watershed and is a popular recreational and tourist area in the county. Other significant lakes in the county include Shupac Lake, Shellengarger Lake, and Jones Lakes. Smaller lakes are quite numerous.

Woodland Resources

According to 2001 U.S. Forest Service statistics, forestland accounts for approximately 90% of the county's total land area, **Figure 2.10**. The majority of timberland in the county is in public ownership. 52% is state owned (Au Sable State Forest) and 16% is federally owned (Huron National Forest), **Figure 2.11**. Most of these lands are managed under a multi-use concept, which is directed toward recreation. The use of military forestland is not geared toward commercial forest production. Some areas have been determined as refuge areas for the endangered Kirtland Warbler.

Community Wildfire Protection Plan



Community Wildfire Protection Plan

Major forest species found in the county are Jack Pine (27%), Oak/Hickory Group (23%), and Aspen (21%). The Maple/Beech/Birch Group totals 12%. A small amount of forestland is comprised of Black Spruce (6%), Balsam Fir (4%), and Red Pine (4%). Smaller acreages of Eastern White Pine, White Spruce, Northern White Cedar, White Pine/Red Oak/White Ash, and Paper Birch are also present. The abundance of jack pine and oak forests dramatically increase wildfire hazard for Crawford County.

The Michigan Department of Natural Resources has compiled pre-European settlement vegetation maps of counties in Michigan. The maps were generated from information contained in the first government land survey notes in the 1800's along with information such as current vegetation, land forms, and soils. A review of the pre-settlement vegetation map of Crawford County shows extensive areas were covered with jack pine-red pine forest, white pine-red pine forest, pine barrens, and pine/oak barrens; see **Figure 2.12**. Note extensive areas of pine barrens and oak barrens (colored yellow), which clearly shows wildfires were very much part of the natural ecosystem, prior to logging and associated wildfires in the late 1800's. Also, with better wildfire control and reforestation efforts, there's actually more forestland today than in the early 1800's.

Figure 2.13 shows forest types generated from the Michigan Resource Information System inventory in the 1980's. The map shows the continued dominance of pine forest types in the County. The map depicts the Wildlands/Urban Interface of residential development in areas dominated by Jack Pine and Red Oak indicating wildfire susceptibility.

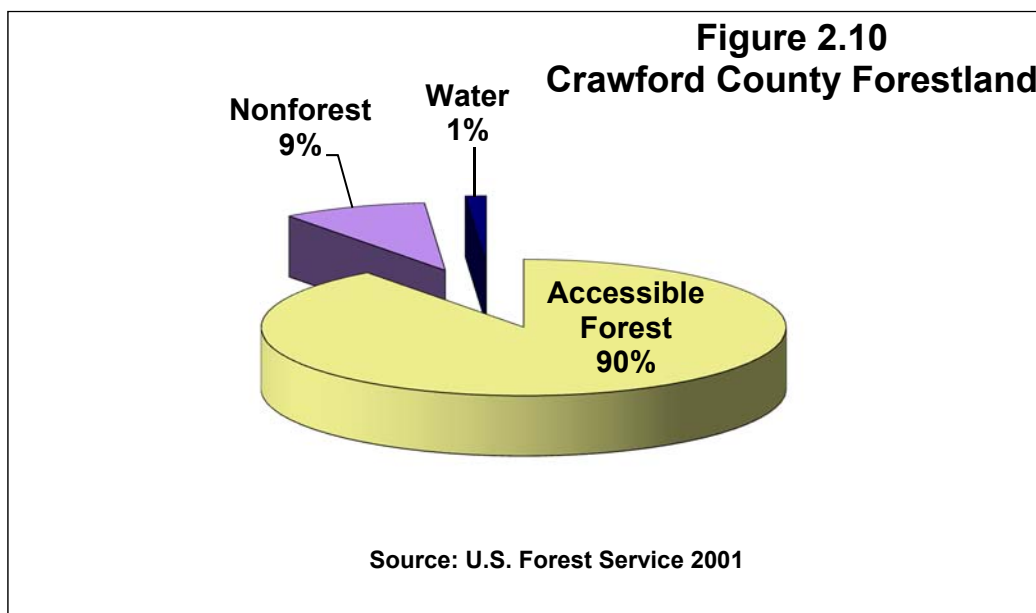
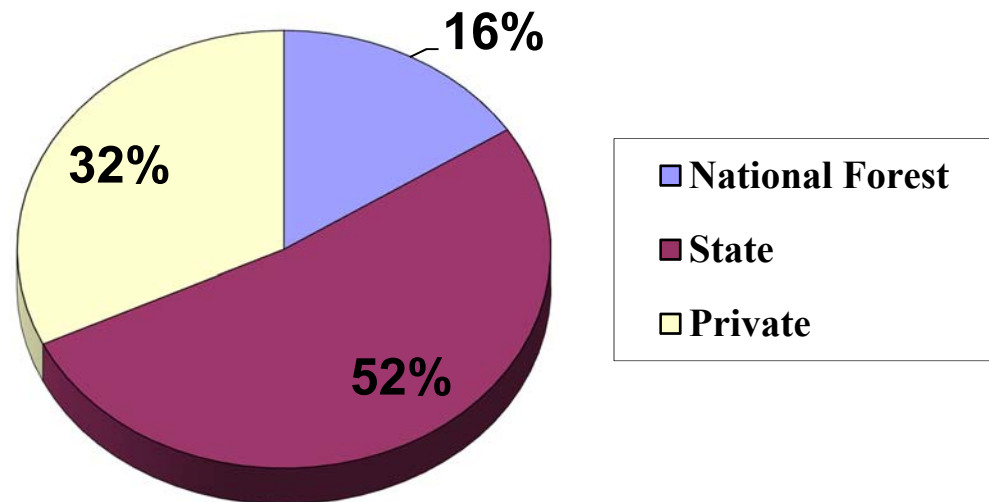
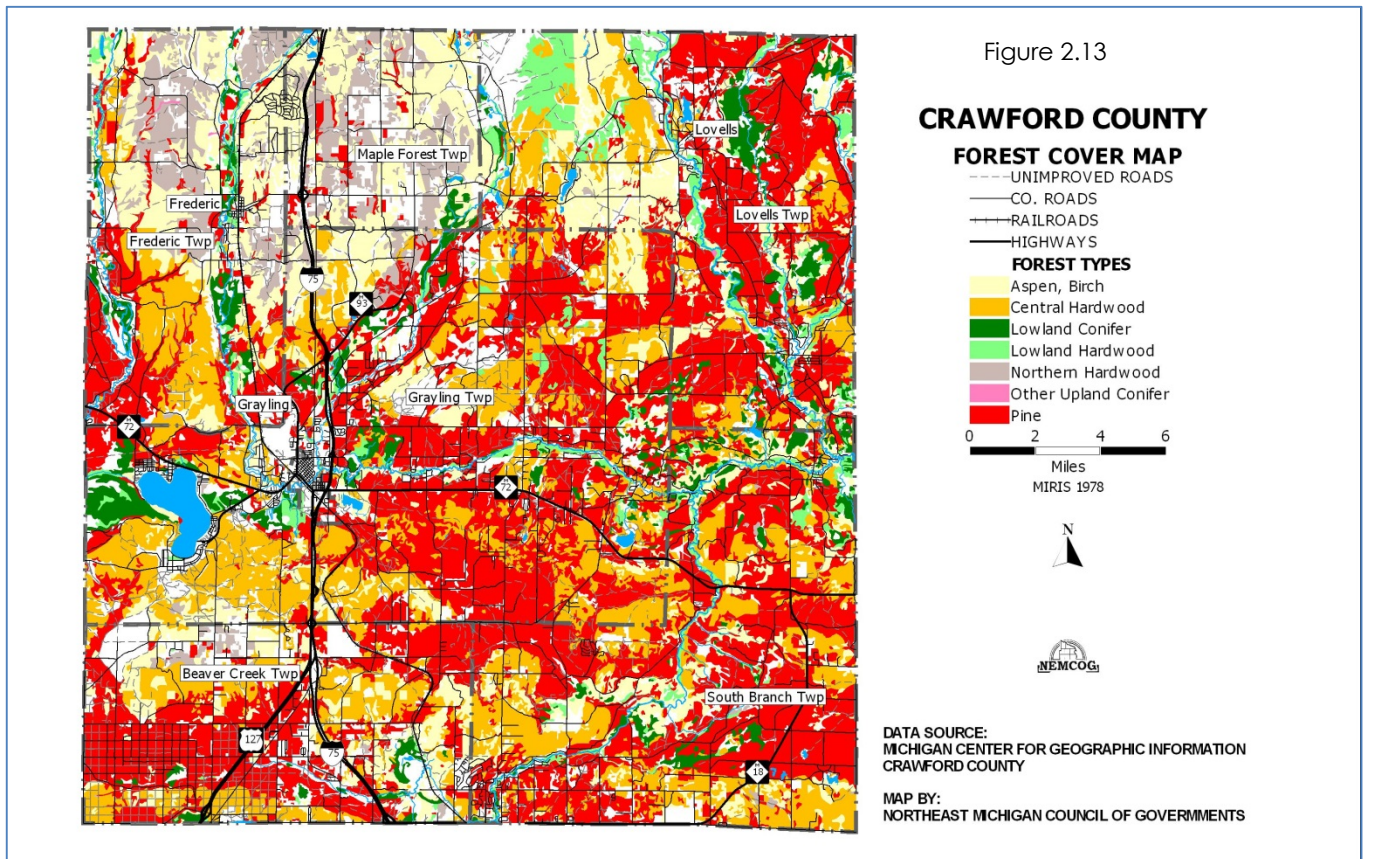
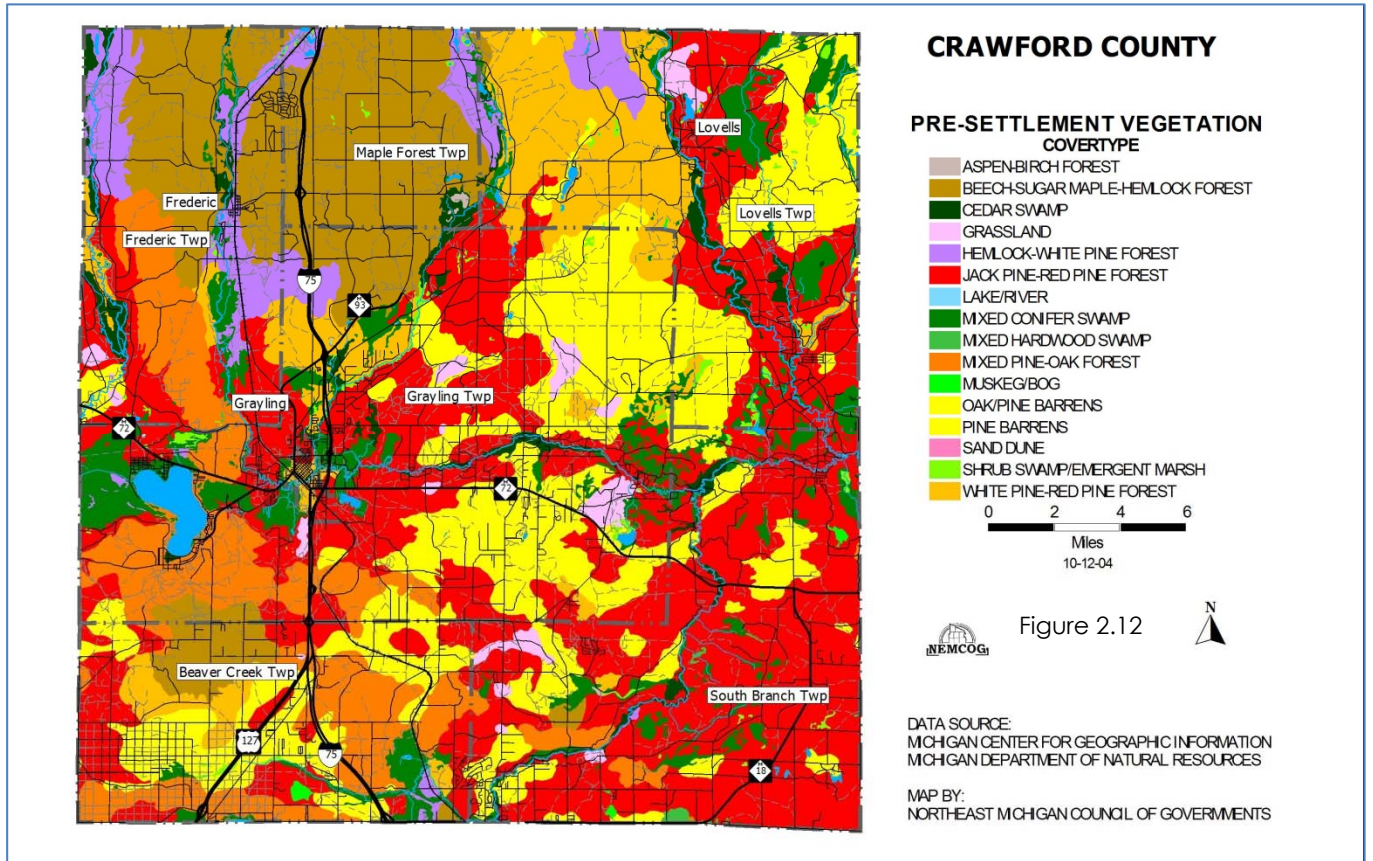


Figure 2.11
Crawford County Forestland Ownership



Community Wildfire Protection Plan



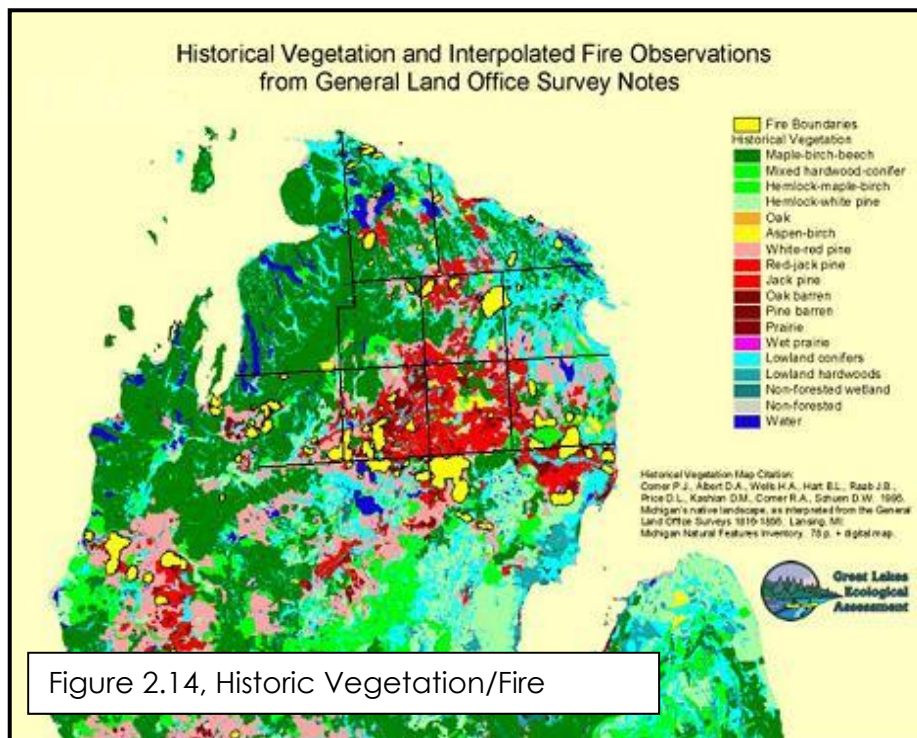
Fire Hazards

Wildfire

Wildfire is defined as an uncontrolled fire in grass, brush lands, or forested areas. The most immediate dangers from wildfires are the destruction of homes and timber, danger to wildlife, and injury or loss of life to persons who live in the affected area or who are using recreational facilities in the area. Long-term effects can be numerous and include scorched and barren land, soil erosion, landslides/mudflows, water sedimentation, and loss of recreational opportunities. Forests cover approximately one-half of Michigan's total land base. As a result, much of the state is vulnerable to wildfire. In addition, development in and around forests and grasslands is increasing rapidly, making public safety a primary consideration in wildfire mitigation and suppression efforts.

Almost 91 percent of Crawford County is forested. Forest types vary depending upon the soils, moisture, and past activities such as logging, fires, and land clearing. Jack pine, aspen-birch, and oak are the most common forest types. According to the MIRIS Land Cover/Use Inventory, the most prevalent forest type is jack pine, covering over 24.8 percent of the county, with dry land oaks covering 21%. The draughty, low fertility sandy soils, found in outwash plains and channels, supported pre-settlement jack pine forests that for thousands of years were perpetuated by wildfires. A review of the pre-settlement vegetation of Crawford County shows extensive areas were covered with pine and oak forests.

Figure 2.14 was compiled by the Great Lakes Ecological Assessment project. The map shows historical vegetation and interpolated fire observations (in yellow) for northern Michigan. Approximate county boundaries were drawn on the maps as a reference. As can be seen on this map, most of Crawford County was covered with forests prone to wildfires, and wildfires were common.



Community Wildfire Protection Plan

Information from the Michigan Department of Natural Resources shows there were 135 wildfires from 2012 to October 2018 in the county that resulted in 5725 acres burned.

(Table 2.11) *It should be noted that the figures shown in the table do not include those wildfires suppressed by local volunteer fire departments or the U.S. Forest Service.* If

records from those sources were readily available, the number of wildfires and acres burned would be higher.

Nevertheless Crawford County ranks very high among Northeast Michigan counties.

The relatively high number of wildfire occurrences in

Crawford County during this

time may be partially explained

by the proximity of population

centers and high recreational

use within the wildfire prone

pine/oak forests of the County.

A review of data provided by

the MDNR found between 2012

and October 2018 there were six wildfires greater than 50 acres in size. All those fire

were on military training areas. The largest fire in recent history was the Meridian

Boundary Fire, which occurred on May 18, 2010, consumed 8,586 acres. **Figure 2.16**

shows the location of wildfires in Crawford County from 2001 to May of 2012. **Table 2.12**

is a listing of large fires in the Crawford County Area. The table show number of acres burned and structures lost.

Table 2.11 Number of Wildfires by County in Northeast Michigan, 2012-October of 2018 (MDNR jurisdiction only)		
County	Number of Wildfires	Acres Burned
Alcona	131	690
Alpena	112	145
Cheboygan	89	127
Crawford	133	5725
Montmorency	96	98
Oscoda	43	70
Otsego	124	182
Presque Isle	42	117
Source: Michigan Department of Natural Resources, Forest Management Division		

Currently, about 2% of all wildfires in Michigan are caused by lightning strikes; the rest are caused by human activity. Outdoor burning is the leading cause of wildfires in Michigan. Most Michigan wildfires occur close to where people live and recreate, which puts both people and property at risk. The immediate danger from wildfires is the destruction of property, timber, wildlife, and injury or loss of life to persons who live in the affected area or who are using recreational facilities in the area.

Although Michigan's landscape has been shaped by wildfire, the nature and scope of the wildfire threat has changed. Michigan's landscape has changed substantially over the last several decades as residential development continues to expand into the same historic wildfire prone areas. A 60% increase in the number of rural homes since the 1980's has increased the potential for loss of life and property from wildfires. There are simply not enough fire suppression forces available in rural areas to protect every structure from wildfire. The large number of permanent and seasonal homes in northeastern Michigan, coupled with increased tourism during drier, and therefore most vulnerable, times of the year greatly increases the risk from wildfires.

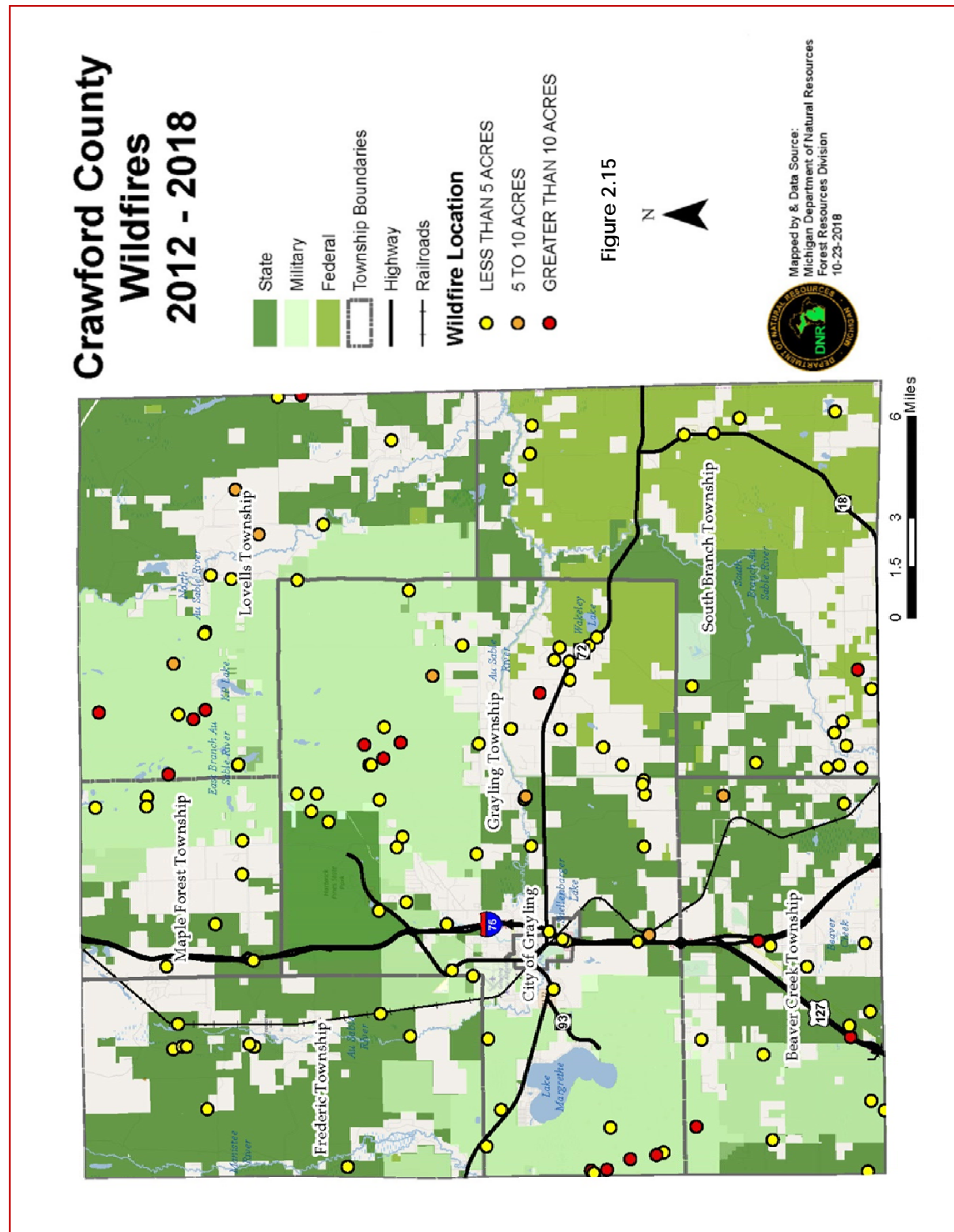
Community Wildfire Protection Plan

Table 2.12
Large Fire Incidents near Grayling Michigan

Year	Name	Acres Burned	Structures Damaged or Lost
1980	Mack Lake Fire	over 24,790 acres	1 fire fighter killed 44 houses destroyed
1990	Billman Fire (i.e; Indian Glens)	615 acres	5 houses and 15 outbuildings
1990	Stephan Bridge Fire	5,916 acres	76 houses and 125 outbuildings
	Note- Stephan Bridge and Indian Glens Fires occurred simultaneously, Stephan Fire burned over an 8 mile stretch in less than 4 hours		
1992	Luzerne Fire	687 acres	Destroyed several homes
2000	No Pablo Fire	5,200 acres	No structure lost
2000	Sunrise Fire	180 acres	1 outbuilding
2001	Jacobs Fire		
2006	Hughes Lake Fire Suppression costs over 1 million	6,000 acres	23 structures
2008	Four Mile Road Fire note this fire closed I-75 for a period and interfaced with the City of Grayling	1,345 acres	4 houses
2008	Staley Lake Fire	80 acres	0 structures
2010	Meridian Boundary Fire	8,586 acres	12 houses and 39 outbuildings
2010	Range #9 Fire	1,040 acres	4 houses, 3 commercial buildings, 1 outbuilding
	Note, Meridian and Range 9 Fires burned simultaneously		
2011	Howes Lake Fire heavy interface with residential area much potential for loss of homes with this fire	817 acres	2 outbuildings
2012	Range 8 Fire	96 acres	
2015	Range 30 Fire	844 acres	
2016	Range 40-45	2,250 acres	
2018	Range 30	101 acres	
2018	Range 46	1,900 acres	
2018	South Grayling Rd	44	Closed I 75 North and South bound lanes
2018	Air to Ground Aspen	63	

Source: MDNR

Note, between 1981 and 2000, MDNR recorded 351 wildfires in Kalkaska County, 519 wildfires in Otsego County, 698 wildfires in Crawford County, and 371 wildfires in Roscommon County

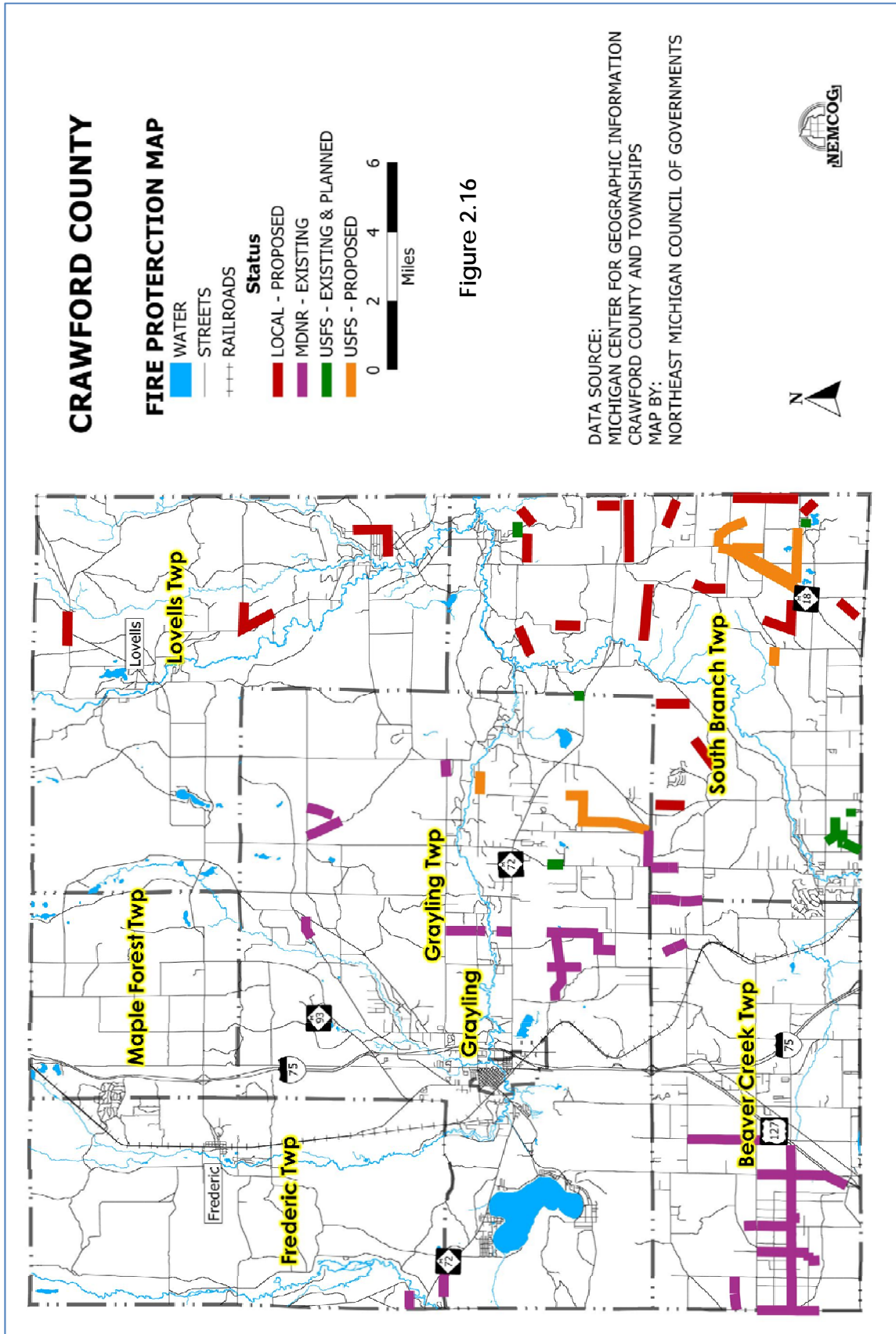


Existing and Proposed Fuel Breaks

The Michigan Department of Natural Resources (MNDR) and the US Forest Service (USFS) have programs for establishing and maintaining fuel breaks in Crawford County. It is acknowledged that in recent years, maintenance of some fuel breaks has not been adequate. It is important for both agencies to secure needed funding to maintain existing fuel breaks and establish new fuel breaks. **Table 2.13** is a listing of existing and proposed fuel breaks on US Forest Service lands. **Figure 2.17** shows the locations of existing and proposed fuel breaks on MDNR and USFS lands.

National Guard (NG) high hazard areas are identified by the MNDR and NG. Fuel breaks are identified and put in with funding and manpower by National Guard. NG will maintain the fuel breaks, sometimes using timber sales for final clearing.

Table 2.13 USFS Fuel Breaks – Existing/Planned and Proposed				
Name	Location (T/R/S)	Existing/Planned	Proposed	Acres*
Kneff Lake	T26N, R2W, Sec. 20	X		24
East Pines	T25N, R2W, Sec. 32	X		42
Deerheart Valley NW	T25N, R2W, Sec 32	X		14
Deerheart Valley SW	T25N, R2W, Sec 32	X		13
Deerheart Valley NE	T25N, R2W, Sec. 33	X		21
Deerheart Valley SE	T25N, R2W, Sec. 33	X		5
Chase Bridge/M-18	T25N, R2W, Sec. 33	X		14
North Windy Hill	T26N, R 2W, Sec. 33	X		4
South Windy Hill	T26N, R2W, Sec. 33	X		2
South Branch Barrens	T26N, R2W, Sec 24	X		9
West Lingerlonger	T26N, R1W, Sec. 11	X		4
East Lingerlonger	T26N, R1W, Sec. 12	X		4
West Lake Hills	T25N, R1W, Sec. 25, 26	X		14
Brush Road	T25N, R1W, Sec. 11, 13		X	60
M-18	T25N, R1W, Sec. 11, 14, 22, 27, 28		X	215
Hunter Lake Road	T25N, R1W, Sec. 22, 23		X	50
Shaw Park	T26N, R2W, Sec. 10		X	22
Chase Bridge	T26N, R2W, Sec. 22, 28, 33		X	190
Source: Huron National Forest, US Forest Service				
*Acres are approximate				



Chapter 3

Planning & Zoning

Introduction

Planning and Zoning are the principal tools that local communities have to manage growth, preserve community character, protect property values, and enhance the economic viability of the area. Planning helps establish and focus the desired future of the community and zoning ordinances are used as one of the primary ways to implement the community master plan.

A master plan contains information on social and economic data, natural resources, existing community services and facilities, and existing land uses. The plan looks into the future by providing goals, future land use plan, and implementation sections. The future land use plan recommends locations for various types of future development and protects existing development.

The Michigan Planning Enabling Act, P.A. 33 of 2008, states a city, village, township or county may adopt, amend, and implement a master plan. The Michigan Planning Enabling Act states a number of criteria a community must consider when planning for development. Two of those related to wildfires are: 1) the plan will, in accordance with present and future needs, best promote public health, safety, morals, order, convenience, prosperity, and general welfare, and 2) the plan will provide for the promotion of or adequate provision for safety from fire and other dangers.

The Michigan Zoning Enabling Act, Public Act 110 of 2006, enables local units of government to regulate the development and use of land by enacting and administering a zoning ordinance. The fundamental purpose of this ordinance is to promote and safeguard the public health, safety, and general welfare of the people of the community. The law provides a community the authority to reduce hazards to life and property, which is the basis for incorporating Firewise principals into a zoning ordinance.

The purpose of this chapter is to present the status of planning and zoning in Crawford County. Firewise audits were conducted for each community's master plan and zoning ordinance. Audit results show communities where they are deficient in relation to mitigating impacts from wildfires. Summaries of the audit are presented in this chapter.

Table 3.1 presents the status of planning and zoning in Crawford County. Crawford County, the City of Grayling, and all the townships have adopted master plans. Grayling and all of the townships administer their own zoning ordinance.

Community Wildfire Protection Plan

Table 3.1 Planning and Zoning Status		
Municipality	Master Plan (year adopted)	Zoning Ordinance (year of last amendment)
Beaver Creek Township	2019	2008
Frederic Township	2009	2006
Grayling Township	2014	2018
Lovells Township	2014	2006
Maple Forest Township	2013	2009
South Branch Township	2006	2018
City of Grayling	2015	2017
Crawford County	2014	-
Source: NEMCOG Planning & Zoning Review		

Master Plan Audits

Current copies of master plans were obtained and reviewed. Six questions focused on the natural resource or environmental chapters of the master plans. Forest types, one of the major risk factors for wildfires, were discussed in all community master plans. However, more detailed descriptions such as types and identification of high risk wildfire areas were found in Crawford County and the Townships of Grayling, Beaver Creek, and South Branch. Most of the plans identified soil types and lakes/rivers. Several master plans identified oil and gas wells. In terms of planning for wildfire protection, five plans had goals and objectives relating to wildfires and four communities addressed wildfires in their future land use plans. See **Table 3.2**.

Zoning Ordinance Audits

Each community in Crawford County was audited for information contained in their zoning ordinance and other local ordinances pertaining to wildfire protection. South Branch Township requires a Firewise Audit for new structures and for structural alterations and reconstruction of existing buildings. None of the local ordinances addressed Firewise techniques for vegetative fuel clearance or for managing dangerous fuel load. Communities have adopted private road and driveway regulations. Two communities require underground utilities in Planned Unit Developments. Street signage requirements are covered by a county ordinance. One township requires two ingress and egress roads for PUD's. See **Table 3.3**.

Community Wildfire Protection Plan

Table 3.2 Master Plan Checklist								
	Crawford Co	City of Grayling	Grayling Twp.	Frederic Twp.	Lovells Twp.	Maple Forest Twp.	Beaver Creek Twp.	South Branch Twp.
<i>Identifies forest types</i>	X	X*	X	X	X*	X	X	X
<i>Identifies high risk wildfire areas</i>	X		X				X	X
<i>Identifies steep slopes & hydric soils</i>	X	X	X		X	X	X	X
<i>Identifies draughty soils</i>	X*	X*	X*	X		X*	X	X
<i>Identifies rivers & lakes</i>	X	X	X	X	X	X	X	X
<i>Identifies oil & gas wells</i>	X		X	X			X	
<i>Wildfires addressed in goals & objectives</i>	X		X		X		X	X
<i>Wildfires addressed in future land use</i>	X		X				X	X
<i>Wildfires addressed in Implementation section</i>								
<i>*Indicates only limited discussion in plan.</i> <i>**master plan was not available.</i>								

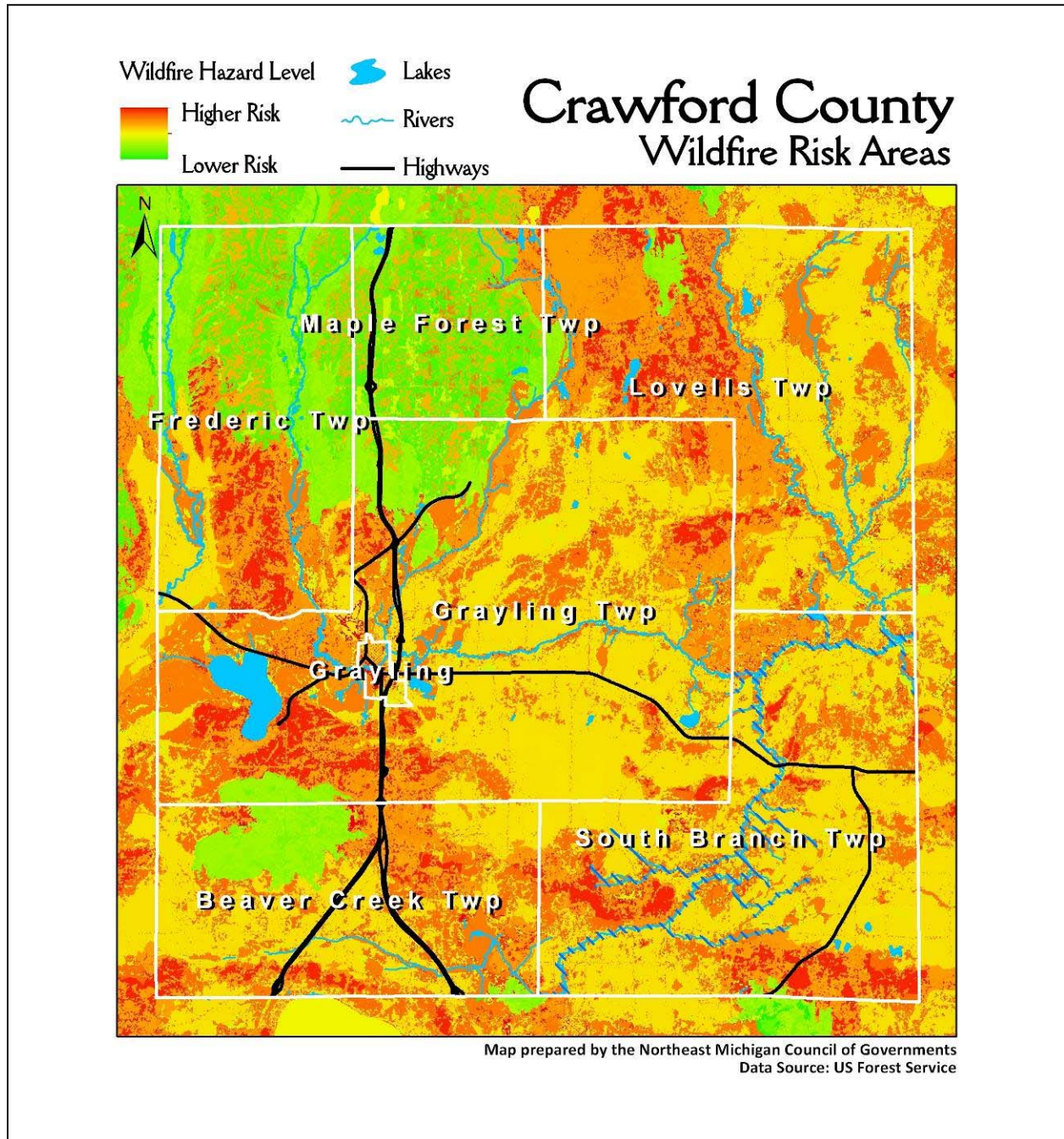
Community Wildfire Protection Plan

Table 3.3
Ordinance Checklist

	Crawford Co	City of Grayling	Grayling Twp.	Frederic Twp.	Lovells Twp.	Maple Forest Twp.	Beaver Creek Twp.	South Branch Twp.
<i>Are wildfires & Firewise addressed in zoning ordinance?</i>			X**					X
<i>Vegetative fuel clearance provisions that require distance between heavy vegetation types</i>			X**					
<i>Standards for private/public road construction?</i>	X	X*	X*	X	X*	X	X	X
<i>Driveway standards?</i>		X	X			X	X	X
<i>Does the community require developments (such as subdivisions, condominium, commercial, recreational and industrial) have two egress ingress roads?</i>								X*
<i>Does the community require developments have underground utilities</i>		X**	X**		X**		X*	X*
<i>Does the community require developments have signage for street identification?</i>	X***	X	X			X	X*	X
<i>Is there an ordinance that requires house addresses to be displayed on 911 signs at the driveway end.</i>	X***							
<i>Vegetative maintenance for managing dangerous fuel loads in high fire risk areas.</i>								
<i>*Means only in specific circumstances, such as PUD</i> <i>** Encouraged</i> <i>*** County-Wide Ordinance</i>								



Zoning and Wildfire Risk Areas

Maps of the following pages show Wildfire Risk Areas overlaid with community zoning maps. As can be seen, much of Crawford County is classified as medium to high risk for wildfires. Since it's not feasible to direct all development away from areas prone to wildfires, communities need to incorporate Firewise principles into their zoning regulations.



City of Grayling Wildfire Risk Areas & Zoning Districts


Wildfire Hazard Level

 Higher Risk
 Lower Risk


 Lakes


 Rivers

 Agricultural & Open Space

 Local Service

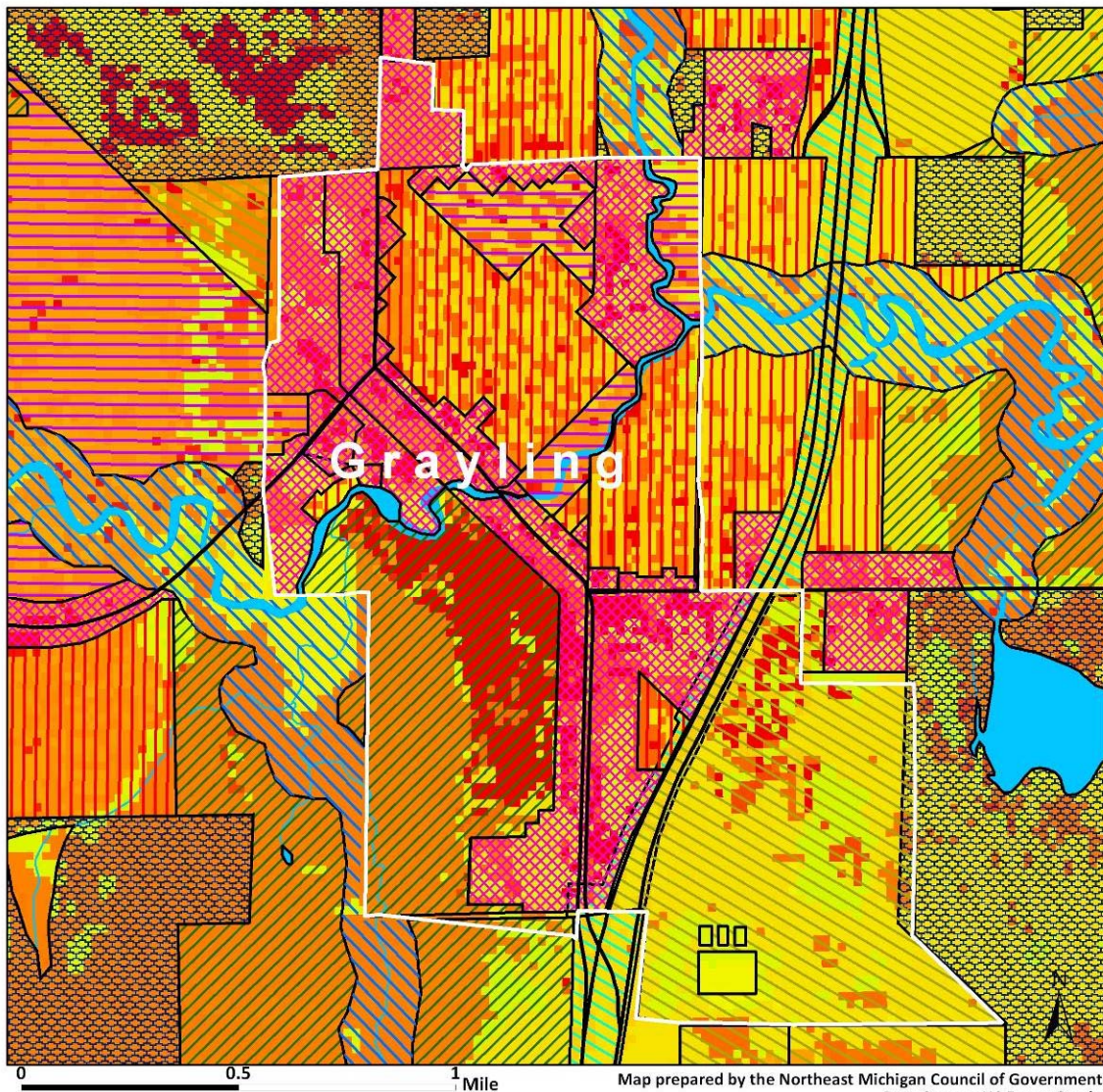
 Medical/Professional Office

 General Commercial

 Industrial & Government

 Single Family Residential

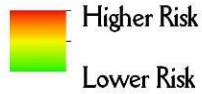
 Residential



Grayling Township

Wildfire Risk Areas & Zoning Districts

Wildfire Hazard Level



Deferred Development



General Commercial



General Residential



Heavy Commercial



I-75



Industrial



Natural River



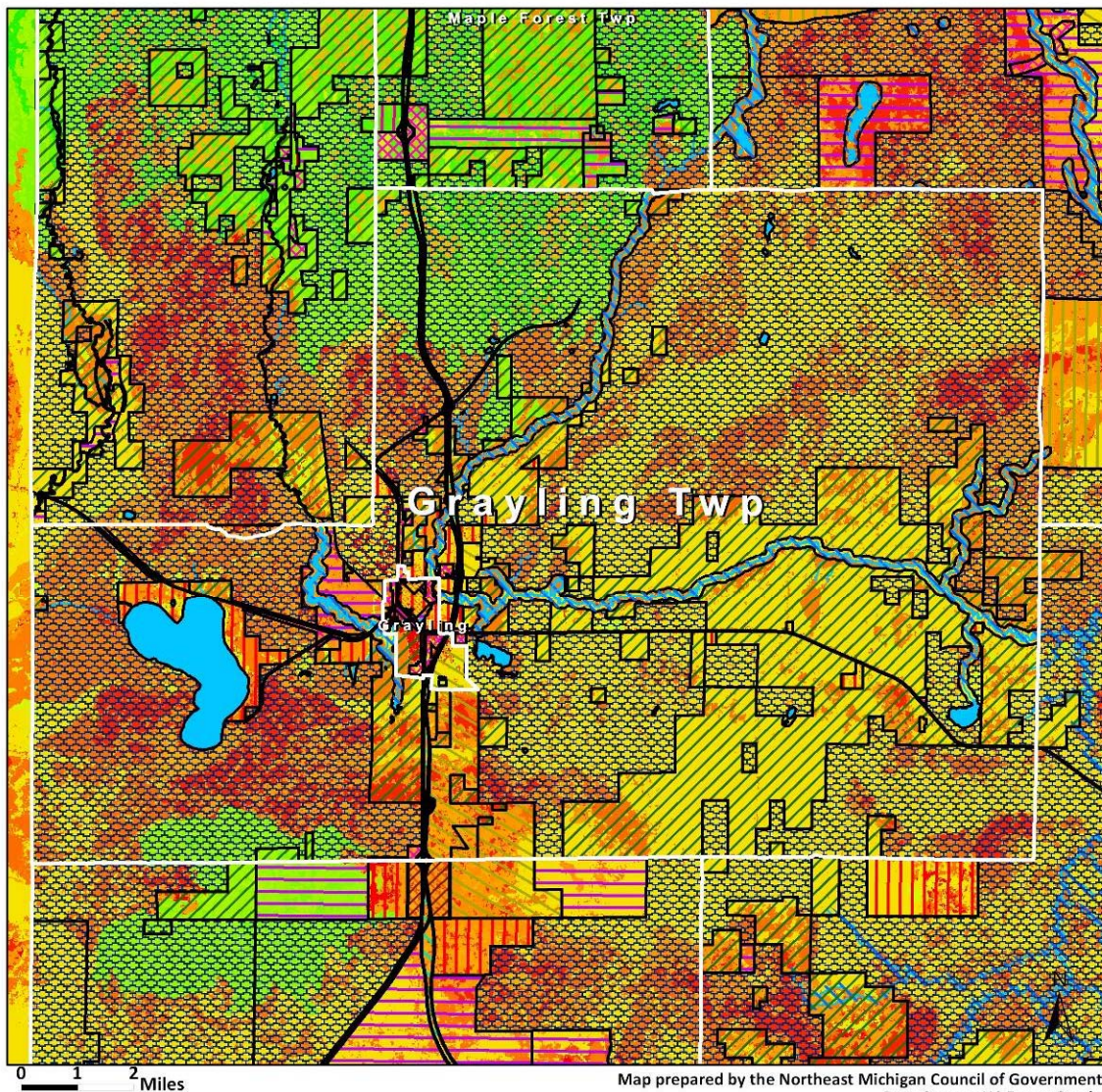
Planned Industrial



Recreational Forest

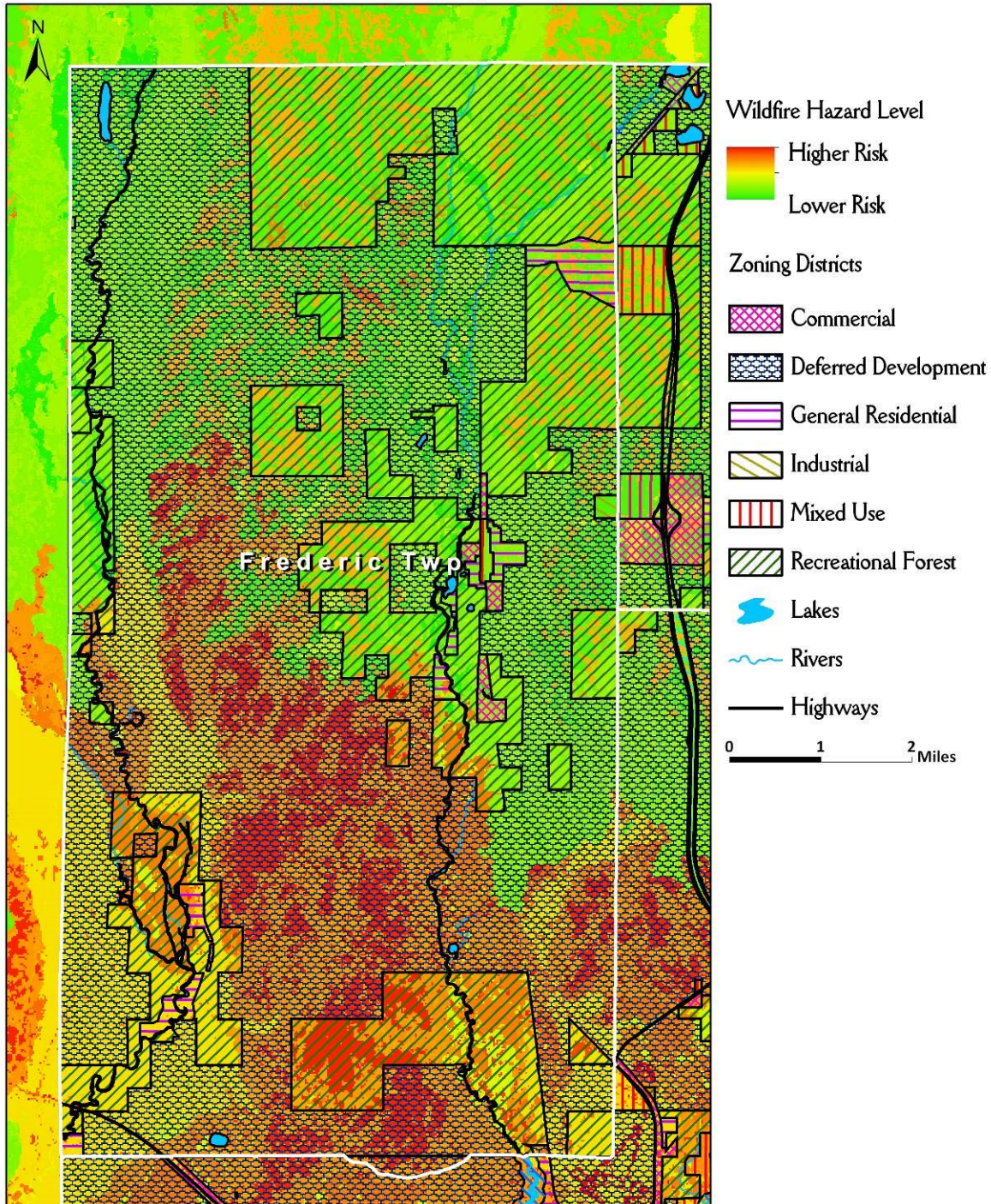


Single Family Residential



Frederic Township

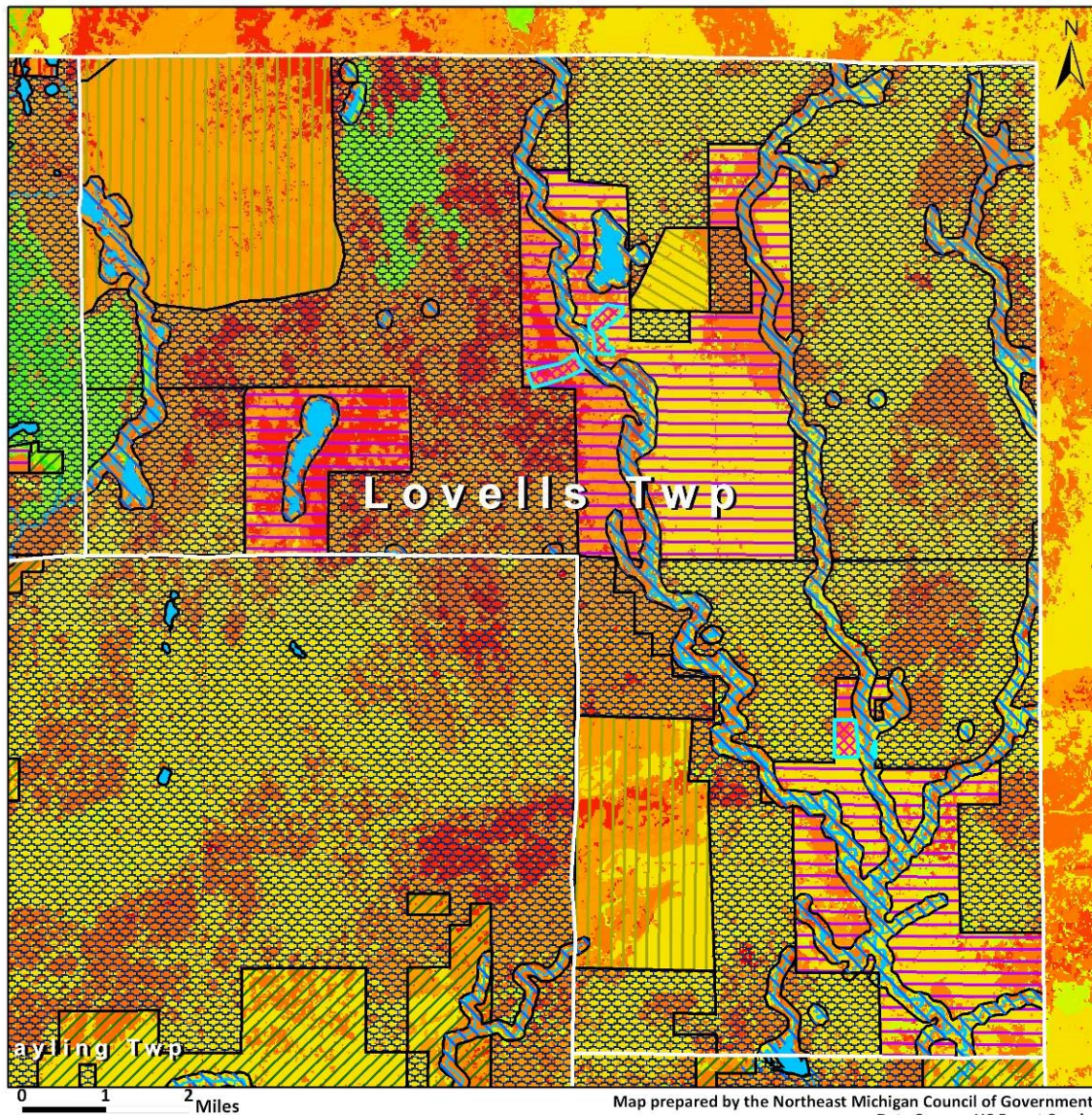
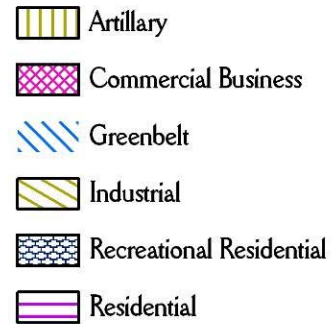
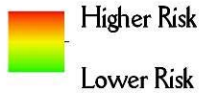
Wildfire Risk Areas & Zoning Districts



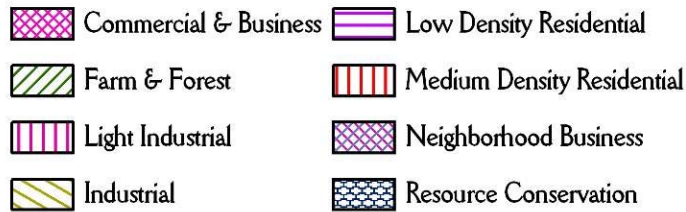
Map prepared by the Northeast Michigan Council of Governments
Data Source: US Forest Service

Lovells Township Wildfire Risk Areas & Zoning Districts

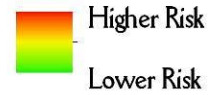
Wildfire Hazard Level



Maple Forest Township Wildfire Risk Areas & Zoning Districts

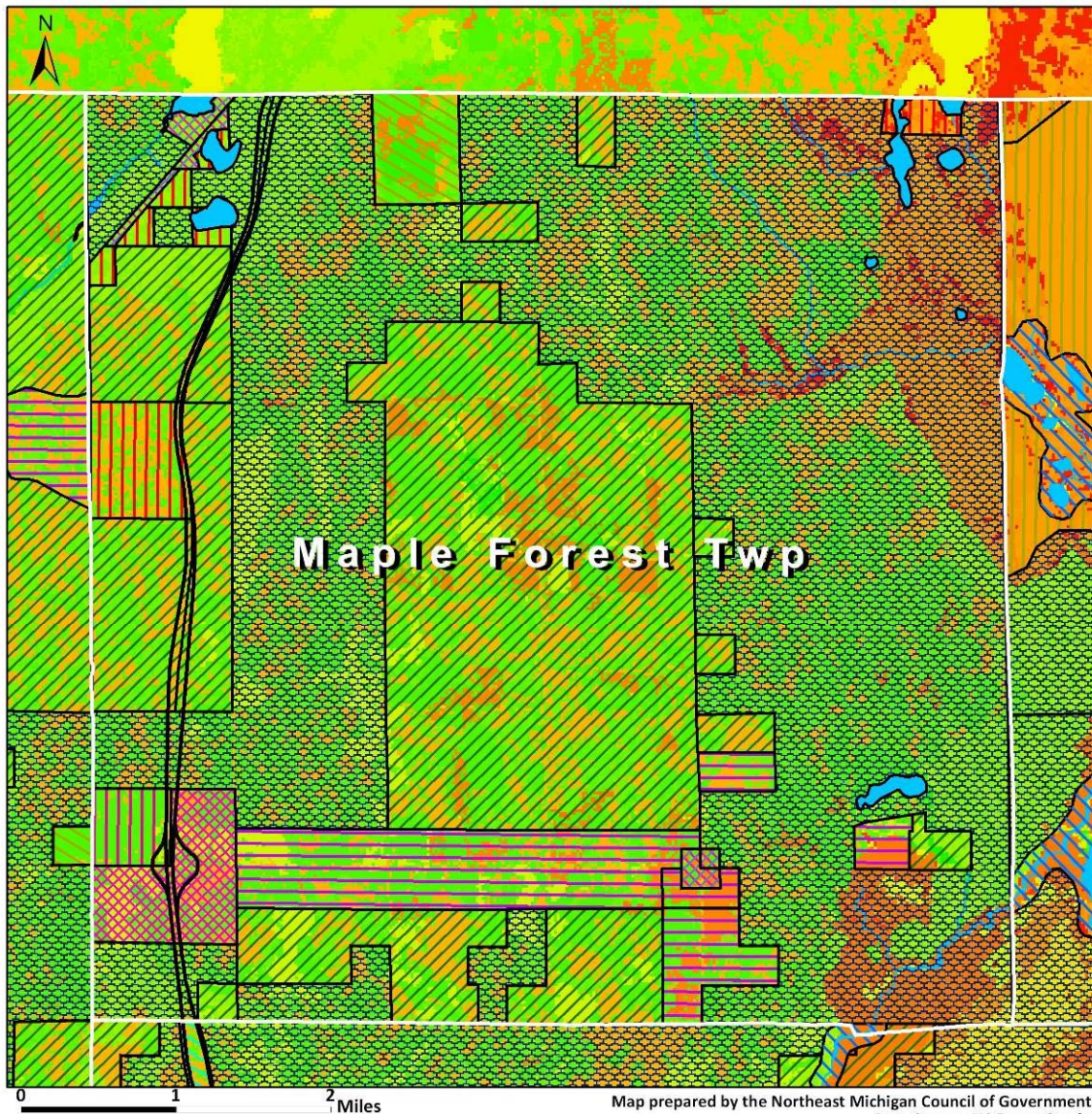


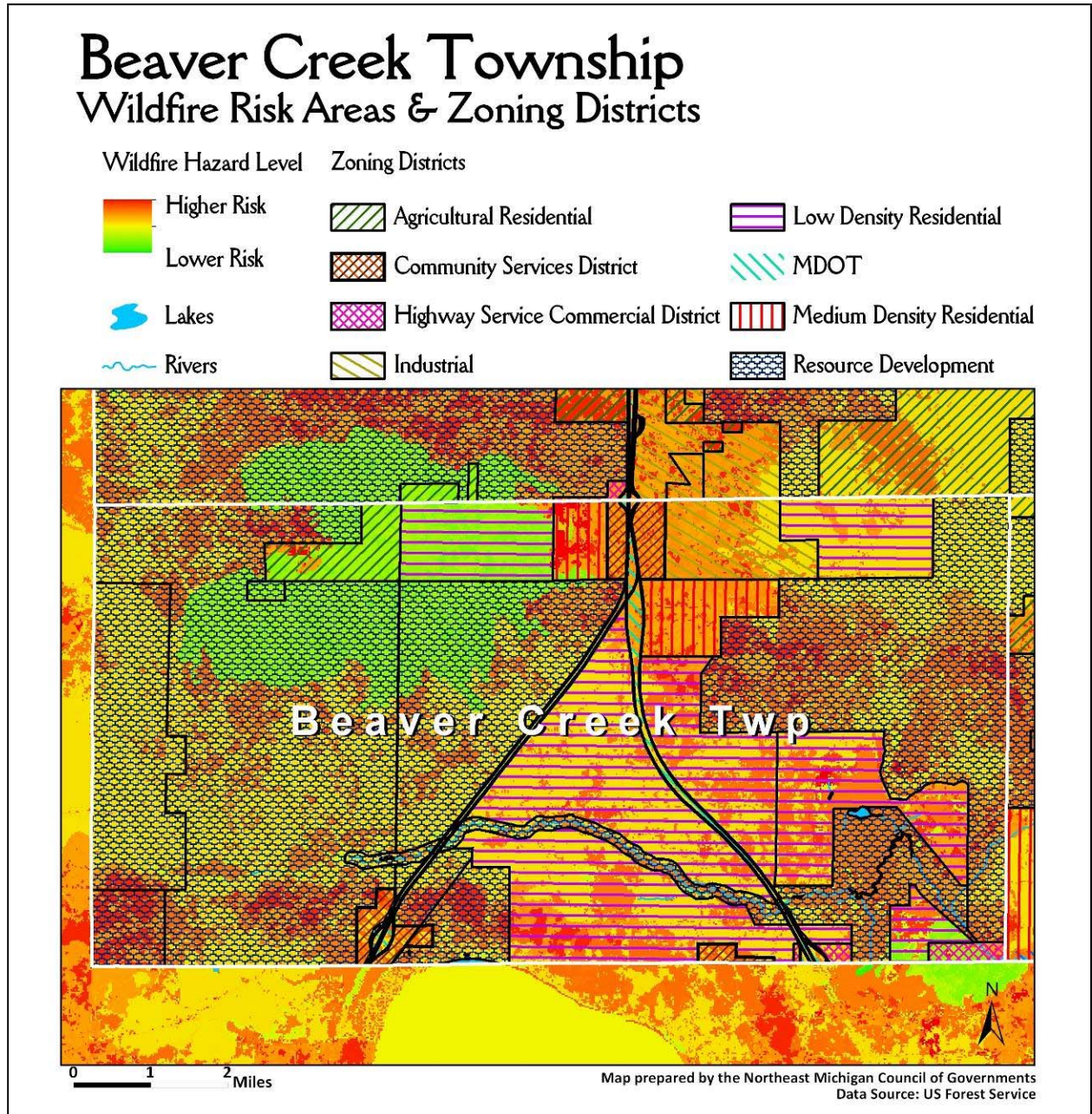
Wildfire Hazard Level



 Lakes

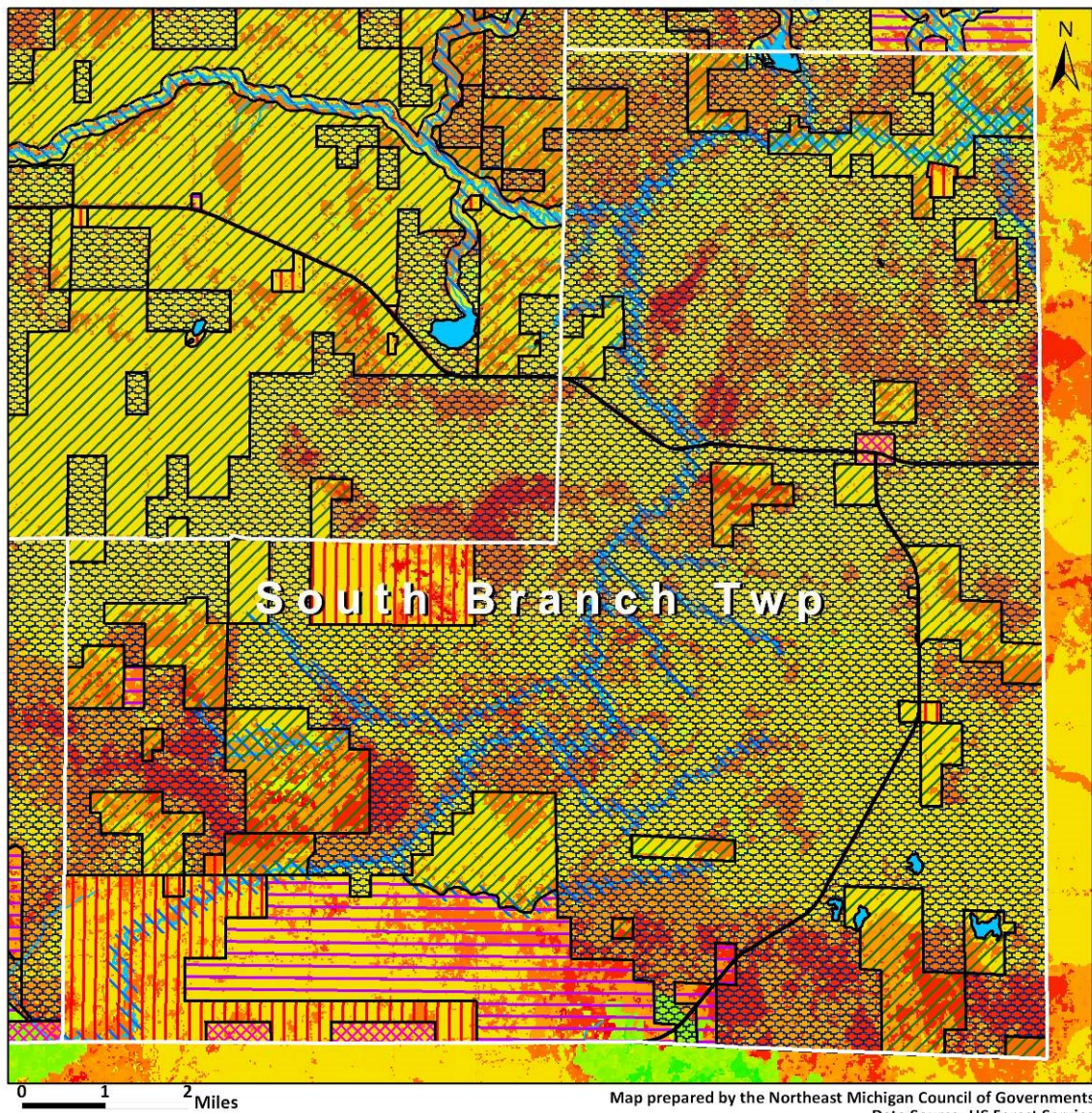
 Rivers





South Branch Township Wildfire Risk Areas & Zoning Districts

Wildfire Hazard Level



Chapter 4

Risk and Vulnerability Assessment

Crawford County is dominated by high risk fuels and combined with high ignition sources such as National Guard and wildlands recreational uses, the County represents one of the highest wildfire hazard areas in Michigan. In addition, high value infrastructure (residential areas, Camp Grayling facilities, oil and gas fields, and National Guard ranges) are located in the Wildlands Urban Interface (WUI) and need to be protected from wildfires.

The Crawford County Community Wildfire Protection Plan (CWPP) offers a variety of benefits to communities at risk from wildland fire. One significant benefit for Crawford County communities is establishing localized definitions and boundaries for their specific Wildland Urban Interface areas (WUI). Without a written Community Wildfire Protection Plan, the Wildland Urban Interface is limited by statute to within ½ mile of a community's boundary or within 1 ½ miles when mitigating circumstances exist, such as sustained steep slopes or geographic features aiding in creating a fire break.

Another benefit is expedited National Environmental Policy Act (NEPA) procedures for federal agencies implementing fuel reduction projects identified in a Community Wildfire Protection Plan fuels treatments can occur along evacuation routes regardless of their distance from the community. At least 50 percent of funds when appropriated under the Healthy Forest Restoration Act must be used within Wildland Urban Interface areas (WUI) as defined by a Community Wildfire Protection Plan or by the limited definition provided by the Healthy Forests Restoration Act when no Community Wildfire Protection Plan exists. Community Wildfire Protection Plans provide a context for prioritizing fuel treatments projects in a cross-boundary, landscape-scale manner that was envisioned in the National Fire Plan and 10-Year Comprehensive Strategy.

Another important reason for completion of a Community Wildfire Protection Plan is that federal agencies must give specific consideration to fuel reduction project implementation plans identified in the Crawford County Community Wildfire Protection Plan. If a federal agency proposes fuel treatment methods in an area addressed by this community plan, but the community identifies a different treatment method, the federal agencies must also evaluate the community's recommendation as part of the federal agencies environmental assessment process.

Risk Assessment and Mitigation Strategies (RAMS)

When developing the community risk assessment, the Community Wildfire Protection Committee utilized the Risk Assessment and Mitigation Strategies (RAMS) planning process. RAMS was developed for fire managers to be a holistic approach to analyzing wildland FUELS, HAZARD, RISK, VALUE, and SUPPRESSION CAPABILITY. It considers the effects of fire on unit ecosystems by taking a coordinated approach to planning at a

Community Wildfire Protection Plan

landscape level, and allows users to develop fire prevention and/or fuels treatments programs. The outcome of the assessment is a composite risk ranking for specific geographic areas of the County accompanied by relevant information and maps that can be used to identify appropriate fire mitigation strategies and allocation of resources.

The steps involved in this process included:

- Listing Management Objectives for Crawford County
- Identification of spatial Compartments for study
- Assessment of significant issues within each Compartment

The RAMS model subdivides Crawford County into one planning compartment. The planning compartments were then broken down into six communities based on the existing township boundaries to allow those areas to be studied in greater depth. Each of the primary risk/hazard rating factors that influence the fire environment are ranked according to their contribution to wildfire risk and hazard within each planning compartment. The values placed on natural and developed areas by the community are also ranked. The RAMS model then combines the relative rankings, Low/Moderate/High, of each of the assessment factors to produce a composite wildfire risk/hazard ranking for the entire planning compartment.

When determining the Wildland Urban Interface (WUI) communities, the Community Wildfire Protection Planning Workgroup reviewed the RAMS data reports, population, population density, historical fire starts, and the fire fuels potential. After careful consideration, the Community Wildfire Protection Planning Workgroup identified six Wildland Urban Interface areas (WUI). Utilizing townships as a geographical boundary for a Wildland Urban Interface Community allowed the local communities latitude in setting local priorities and activities related to fire risk reduction and buffer zones. These activities include fire protection and preparedness, hazardous fuels reduction, restoration of healthy forests, fire prevention, and ecosystem based planning. Each Wildland Urban Interface (WUI) community will serve as a planning area boundary for implementation of the Crawford County Wildland Fire Protection Plan. Projects can overlap between Wildland Urban Interface (WUI) communities and cross different jurisdictions where agreements are in place.

Management Objectives

The following Management Objectives were identified for Crawford County:

1. Utilize fuels management techniques to restore fire to its natural role in the ecosystem. (Source: National Fire Management Plan)
2. Continue to assist and encourage communities to prepare and participate in the CWPP's. (Source: National Fire Management Plan)
3. Support the members of the Michigan Interagency Fire Prevention (MFPA) as a way to further the message of fire prevention. (Source: HMF Fire Management Plan)

Community Wildfire Protection Plan

4. Encourage adequate fire prevention, fire-safe construction, and pre-suppression activities on private lands in WUI using Firewise. (Source: HMF Fire Management Plan)
5. Suppress wildfires using an appropriate management response, in a manner compatible with Management Area objectives. (Source: HMF Fire Management Plan)

Compartment Design Criteria

Each Township within the county was evaluated due to the ease of identifying discreet boundaries.

Code Description

- | | |
|---|--|
| 1 | Beaver Creek Township |
| 2 | Frederic Township |
| 3 | Grayling Township and City of Grayling |
| 4 | Lovells Township |
| 5 | Maple Forest Township |
| 6 | South Branch Township |

Fuels Hazard Criteria

The assessment of FUEL HAZARDS deal with identifying areas of like fuel behavior based on fuel and topography. Given normal fire season, how intense (as measured by Flame Length) would a fire burn? Under average fire season conditions, fire intensity is largely a product of fuel and topography.

Table 4.1 Fuel Hazard Rating			
Vulnerability Factors	High	Medium	Low
FUEL (flame length produced)	8+ feet	4-6 feet	0-2 feet
CROWNING POTENTIAL (as per Appendix A)	6+	3-5	0-2
SLOPE (average)	36+%	21-35%	0-20%
ASPECT (dominant on site)	South	East or West	North, Northwest or Northeast
ELEVATION	0-3500 feet	3501-5000 feet	500l+ feet
Source: RAMS			

Community Wildfire Protection Plan

Table 4.2 Protection Rating			
Vulnerability Factors	Complex	Average	Simple
INITIAL ATTACK (first suppression forces to center of unit)	31 minutes	21 - 30 minutes	0 - 20 minutes
SUPPRESSION COMPLEXITY (access, fuel conditions, fire barriers, structure problems)	Limited to poor access, medium fuel, minimally effective barriers, some structures	Reasonable access, some fuel problems, some barriers, no structures	Good access, light fuel, good barriers to fire spread, no structures
RESISTANCE TO CONTROL (fire line production capability)	0.6+ chains/person hour	1.4 to 2.5 chains/person hour	More than 2.6 chains/person hour
RATE OF SPREAD (behave output)	9+ chains per hour	5 - 8 chains per hour	1 - 4 chains per hour
Source: RAMS			

Community Wildfire Protection Plan

Table 4.3 Ignition Risk Rating			
Criteria	HIGH	MODERATE	LOW
Population Density	100 + people per miles ²	50 – 100 People per Miles ²	0 – 50 People per Miles ²
Housing Units	1000 + Dwellings/Structures	501 – 1000 Dwellings/ Structures	0 – 500 Dwellings / Structures
Power Lines	Transmission Lines Distribution Lines Sub Station	Transmission Lines Distribution Lines	None
Industrial Operations	Active Timber Sales Construction Project Debris / Burning Mining Maintenance/Service Contracts	3 – 4 of the 5 categories	1 – 2 of the 5 categories
Recreation	Developed Camping Areas	Dispersed Camping areas, party areas, hunters, water-based, and hiking	Off Highway vehicle use
Flammables Present	Gas pumps or Storage / Gas or oil wells / transmission lines Powder Magazines	Gas pumps or Storage and Gas or oil wells / transmission lines	Gas pumps or Storage OR Gas or oil wells / transmission lines
Railroads	YES		NO
Transportation System	State/Federal Highways County Roads Public Access Roads	County Roads Public Access Roads	Public Access Roads
Commercial Development	Camps, resorts, and stables. Business, agriculture, and ranching Schools	2 of the 3 categories	1 of the 3 categories
Other	More than 5 of the following categories: Fireworks, Children with Matches, Woodcutting Area, Powder Equipment, Government Operations, Incendiary, Cultural Activities, Shooting/Target, Electronic Installations, and Dump	3 – 4 of the 8 categories	1 – 2 of the 8 categories
Source: RAMS			

Community Wildfire Protection Plan

This assessment process looks at the natural resources and human-made improvements on the site. It is used to reflect the potential physical and economic changes which may occur in the number or quality of outputs.

Table 4.4 Value Rating			
Vulnerability Factors	High	Medium	Low
RECREATION	Developed recreation site within or adjacent to area	Undeveloped high recreation use	Undeveloped average recreation use
ADMINISTRATIVE (improvements)	Administrative site is adjacent to or within area with high resource or special use values	Average or normal resource or special use values	Minimal resource or special use values
WILDLIFE	Highly significant. Suitable habitat present for reproduction/feeding	Moderately significant. Habitat capability low. Can become suitable in foreseeable future	Relatively insignificant habitat. Suitable habitat not present nor will ever become suitable
RANGE USE	Range allotment within area, significant use	Range allotment within area, normal/average use	Little or no range use
WATERSHED	Stream Class PI, I. Important water use/ riparian area. Domestic water use.	Stream Class I, II. Rocky, little riparian vegetation. No specific water use. No perennial flow. Low hazard.	Stream Class III, IV, VI. Little or no riparian vegetation or suitable habitat. No mass movement potential.
TIMBER	Standing timber/ woodland inventory on 51+% of area	Standing timber/ woodland inventory on 26 - 50% of area	Standing timber/ woodland inventory on 25% or less of area
PLANTATIONS (existing or programmed)	31+% of area in or programmed for plantations	16 - 30% of area in or programmed for plantations	15% or less of area in or programmed for plantations
PRIVATE PROPERTY (facilities, structures, community safety urban interface intermix)	High loss and threat potential due to numbers and placement	Threat to structures and property	Little or no threat or loss potential
CULTURAL RESOURCES (significance)	Archeological/ historical findings of high significance	Minimal archeological/ historical findings, potential for Native American gathering/ ceremonial use	No archeological/ historical findings, little potential for Native American use
Source: RAMS			

Community Wildfire Protection Plan

(Continued) Table 4.4 Value Rating			
Vulnerability Factors	High	Medium	Low
SPECIAL INTEREST AREAS (public concern, employment)	A majority of the area is classified as Special Interest Area	Area is adjacent to a Special Interest Area	No Special Interest Area within or adjacent to the area
VISUAL RESOURCE (significance)	Preserve and retain existing character	Partially retain existing character	Maximum modification dominates
T & E SPECIES	Species present	Species present. No confirmed use for reproduction	Species not present
SOILS (potential loss as per Erosion Hazard Rating)	Highly Erodible EHR 13+	Moderately erodible EHR 4 - 12	Low significance EHR less than 4
AIRSHED (pollutants/visibility)	Class 6 + 5 Airshed high receptor sensitivity	Class 4 + 3 Airshed moderate receptor sensitivity	Class 2 + 1 Airshed/ low receptor sensitivity
VEGETATION (sensitive species)	Pl plant occurrences of significance	Potential for sensitive plants	No sightings, little potential, minimal significance
OTHER (specify)			
Source: RAMS			

Community Wildfire Protection Plan

Compartment 1, Part 1: South Branch Township.

Compartment 1 contains 67,520 acres in Fire Management Zone 01. Representative Locations (RLs) and the percent's in this Compartment are: 1 (100%). The characteristics of the compartment indicate that: **Catastrophic Fire Likely.**

Fuels Hazard characteristics are rated:

- Fuels (flame length produced): 8 + Feet **(High)**
- Crowning Potential: 6 + **(High)**
- Slope Percent: 0 - 20 **(Low)**
- Aspect: South **(High)**
- Elevation: 0 - 2000 **(Low)**

Protection Capability ratings are:

- Initial Attack: 21 - 30 minutes **(Moderate)**
- Suppression Complexity: Complex **(High)**

Ignition Risk factors include:

- Population Density - Wildland Urban Interface
 - 1001+ Dwellings/structures
- Power Lines In Unit
 - Transmission Lines
 - Distribution Lines
- Industrial Operations
 - Active timber sale
 - Construction project
 - Debris/slash burning
 - Maintenance/service contracts
- Recreation
 - Dispersed camping areas, party areas, hunters, water-based, hiking
 - Developed camping areas
 - Off-highway vehicle use
- Flammables Present
 - Powder magazine
 - Gas pumps or storage
 - Gas or oil wells/transmission
- Other
 - Dump
 - Fireworks, children with matches
 - Woodcutting area, power equipment
 - Shooting/target
 - Government operations
- Transportation System
 - State/Federal highway(s)
 - County road(s)
 - Public Access Road(s)
- Commercial Development
 - Business, agricultural/ranching

Community Wildfire Protection Plan

- Camps, resorts, stables

Compartment 1, Part 2: South Branch Township.

Compartment Values are characterized:

- Recreation: Undeveloped high recreation use **(Moderate)**
- Administrative: Administrative sites are present **(Moderate)**
- Wildlife/Fisheries: Moderately significant habitat **(Moderate)**
- Range Use: Little or no range use **(Low)**
- Watershed: Stream Class PI, I. Important water use/riparian area. Domestic water use. **(High)**
- Forest/Woodland: Standing timber/woodland on 51+% of area **(High)**
- Plantations: 16 - 30% or less of area in or programmed for plantations **(Moderate)**
- Private Property: High loss and threat potential due to numbers and placement **(High)**
- Cultural Resources: Minimal archaeological/historical findings, potential for Native American use **(Moderate)**
- Special Interest Areas: Area is adjacent to a Special Interest area **(Moderate)**
- Visual Resources: Preserve and retain existing character **(High)**
- T&E Species: Species present **(High)**
- Soils (Erosion): Moderately erodible (EHR 4-12) **(Moderate)**
- Airshed: Moderate receptor sensitivity **(Moderate)**
- Vegetation: Plant occurrences of significance **(High)**

Compartment 2, Part 1: Grayling Township.

Compartment 2 contains 112,913 acres in Fire Management Zone 01. Representative Locations (RLs) and the percent's in this Compartment are: 1 (100%). The characteristics of the compartment indicate that: **Catastrophic Fire Likely.**

Fuels Hazard characteristics are rated:

- Fuels (flame length produced): 8 + Feet **(High)**
- Crowning Potential: 6 + **(High)**
- Slope Percent: 0 - 20 **(Low)**
- Aspect: South **(High)**
- Elevation: 0 - 2000 **(Low)**

Protection Capability ratings are:

- Initial Attack: 0 - 20 minutes **(Low)**
- Suppression Complexity: Complex **(High)**

Ignition Risk factors include:

- Population Density - Wildland Urban Interface
 - 1001+ Dwellings/structures
- Power Lines In Unit
 - Distribution Lines
 - Sub-station
 - Transmission Lines
- Industrial Operations
 - Active timber sale
 - Construction project
 - Debris/slash burning
- Recreation
 - Dispersed camping areas, party areas, hunters, water based, hiking
 - Developed camping areas
 - Off-highway vehicle use
- Flammables Present
 - Gas pumps or storage
 - Gas or oil wells/transmission
 - Powder magazine
- Other
 - Government operations
 - Dump
 - Fireworks, children with matches
 - Shooting/target
 - Woodcutting area, power equipment
- Railroads
 - Railroads are present
- Transportation System
 - State/Federal highway(s)
 - County road(s)
 - Public Access Road(s)

Community Wildfire Protection Plan

- Commercial Development
 - Camps, resorts, stables
 - Business, agricultural/ranching
 - Schools

Compartment 2, Part 2: Grayling Township

Compartment Values are characterized:

- Recreation: Developed recreation site within or adjacent to area **(High)**
- Administrative: Administrative sites are present **(Moderate)**
- Wildlife/Fisheries: Moderately significant habitat **(Moderate)**
- Range Use: Little or no range use **(Low)**
- Watershed: Stream Class PI, I. Important water use/riparian area. Domestic water use. **(High)**
- Forest/Woodland: Standing timber/woodland on 51+% of area **(High)**
- Plantations: 15% or less of area in or programmed for plantations **(Low)**
- Private Property: High loss and threat potential due to numbers and placement **(High)**
- Cultural Resources: Minimal archaeological/historical findings, potential for Native American use **(Moderate)**
- Special Interest Areas: Area is adjacent to a Special Interest area **(Moderate)**
- Visual Resources: Preserve and retain existing character **(High)**
- T&E Species: Species present **(High)**
- Soils (Erosion): Moderately erodible (EHR 4-12) **(Moderate)**
- Airshed: Moderate receptor sensitivity **(Moderate)**
- Vegetation: Plant occurrences of significance **(High)**

Compartment 3, Part 1: Lovells Township.

Compartment 3 contains 65,070 acres in Fire Management Zone 01. Representative Locations (RLs) and the percent's in this Compartment are: 1 (100%). The characteristics of the compartment indicate that: **Catastrophic Fire Likely.**

Fuels Hazard characteristics are rated:

- Fuels (flame length produced): 8 + Feet **(High)**
- Crowning Potential: 6 + **(High)**
- Slope Percent: 0 - 20 **(Low)**
- Aspect: South **(High)**
- Elevation: 0 - 2000 **(Low)**

Protection Capability ratings are:

- Initial Attack: 21 - 30 minutes **(Moderate)**
- Suppression Complexity: Complex **(High)**

Ignition Risk factors include:

- Population Density - Wildland Urban Interface
 - 1001+ Dwellings/structures
- Power Lines In Unit
 - Distribution Lines
 - Sub-station
 - Transmission Lines
- Industrial Operations
 - Active timber sale
 - Construction project
 - Debris/slash burning
- Recreation
 - Dispersed camping areas, party areas, hunters, water based, hiking
 - Developed camping areas
 - Off-highway vehicle use
- Flammables Present
 - Gas pumps or storage
 - Gas or oil wells/transmission
- Other
 - Fireworks, children with matches
 - Electronic installations
 - Woodcutting area, power equipment
 - Shooting/target
 - Dump
- Transportation System
 - State/Federal highway(s)
 - County road(s)
 - Public Access Road(s)
- Commercial Development
 - Business, agricultural/ranching
 - Camps, resorts, stables

Compartment 3, Part 2: Lovells Township.

Compartment Values are characterized:

- Recreation: Undeveloped average recreation use **(Low)**
- Administrative: Few or no administrative sites **(Low)**
- Wildlife/Fisheries: Highly significant habitat **(High)**
- Range Use: Little or no range use **(Low)**
- Watershed: Stream Class PI, I. Important water use/riparian area. Domestic water use. **(High)**
- Forest/Woodland: Standing timber/woodland on 51+% of area **(High)**
- Plantations: 16 - 30% or less of area in or programmed for plantations **(Moderate)**
- Private Property: High loss and threat potential due to numbers and placement **(High)**
- Cultural Resources: Minimal archaeological/historical findings, potential for Native American use **(Moderate)**
- Special Interest Areas: No Special Interest area within or adjacent to the area **(Low)**
- Visual Resources: Maximum modification dominates **(Low)**
- T&E Species: Species present **(High)**
- Soils (Erosion): Moderately erodible (EHR 4-12) **(Moderate)**
- Airshed: Low receptor sensitivity **(Low)**
- Vegetation: Plant occurrences of significance **(High)**

Compartment 4, Part 1: Beaver Creek Township.

Compartment 4 contains 45,764 acres in Fire Management Zone 01. Representative Locations (RLs) and the percent's in this Compartment are: 1 (100%). The characteristics of the compartment indicate that: **Catastrophic Fire Likely.**

Fuels Hazard characteristics are rated:

- Fuels (flame length produced): 8 + Feet **(High)**
- Crowning Potential: 6 + **(High)**
- Slope Percent: 0 - 20 **(Low)**
- Aspect: South **(High)**
- Elevation: 0 - 2000 **(Low)**

Protection Capability ratings are:

- Initial Attack: 0 - 20 minutes **(Low)**
- Suppression Complexity: Average **(Moderate)**

Ignition Risk factors include:

- Population Density - Wildland Urban Interface
 - 1001+ Dwellings/structures
- Power Lines In Unit
 - Transmission Lines
 - Distribution Lines
 - Sub-station
- Industrial Operations
 - Active timber sale
 - Construction project
 - Debris/slash burning
- Recreation
 - Off-highway vehicle use
 - Dispersed camping areas, party areas, hunters, water based, hiking
 - Developed camping areas
- Flammables Present
 - Gas pumps or storage
 - Gas or oil wells/transmission
- Other
 - Dump
 - Fireworks, children with matches
 - Woodcutting area, power equipment
 - Shooting/target
 - Government operations
- Railroads
 - Railroads are present
- Transportation System
 - State/Federal highway(s)
 - County road(s)
 - Public Access Road(s)
- Commercial Development
 - Camps, resorts, stables

Compartment 4, Part 2: Beaver Creek Township.

Compartment Values are characterized:

- Recreation: Developed recreation site within or adjacent to area **(High)**
- Administrative: Administrative sites are present **(Moderate)**
- Wildlife/Fisheries: Moderately significant habitat **(Moderate)**
- Range Use: Little or no range use **(Low)**
- Watershed: Stream Class III, IV, VI. Little riparian vegetation. No mass movement potential. **(Low)**
- Forest/Woodland: Standing timber/woodland on 51+% of area **(High)**
- Plantations: 31+% or less of area in or programmed for plantations **(High)**
- Private Property: High loss and threat potential due to numbers and placement **(High)**
- Cultural Resources: Minimal archaeological/historical findings, potential for Native American use **(Moderate)**
- Special Interest Areas: Area is adjacent to a Special Interest area **(Moderate)**
- Visual Resources: Maximum modification dominates **(Low)**
- T&E Species: Species present **(High)**
- Soils (Erosion): Moderately erodible (EHR 4-12) **(Moderate)**
- Airshed: Low receptor sensitivity **(Low)**
- Vegetation: Plant occurrences of significance **(High)**

Community Wildfire Protection Plan

Compartment 5, Part 1: Maple Forest Township.

Compartment 5 contains 22,779 acres in Fire Management Zone 01. Representative Locations (RLs) and the percent's in this Compartment are: 1 (100%). The characteristics of the compartment indicate that: **Catastrophic Fire Unlikely.**

Fuels Hazard characteristics are rated:

- Fuels (flame length produced): 4 - 6 Feet **(Moderate)**
- Crowning Potential: 0 - 2 **(Low)**
- Slope Percent: 0 - 20 **(Low)**
- Aspect: South **(High)**
- Elevation: 0 - 2000 **(Low)**

Protection Capability ratings are:

- Initial Attack: 0 - 20 minutes **(Low)**
- Suppression Complexity: Average **(Moderate)**

Ignition Risk factors include:

- Population Density - Wildland Urban Interface
 - 501-1000 Dwellings/structures
- Power Lines In Unit
 - Transmission Lines
 - Distribution Lines
- Industrial Operations
 - Active timber sale
 - Debris/slash burning
- Recreation
 - Dispersed camping areas, party areas, hunters, water based, hiking
 - Developed camping areas
 - Off-highway vehicle use
- Flammables Present
 - Gas pumps or storage
 - Gas or oil wells/transmission
- Other
 - Fireworks, children with matches
 - Woodcutting area, power equipment
 - Shooting/target
 - Government operations
 - Incendiary
 - Dump
- Railroads
 - Railroads not present
- Transportation System
 - State/Federal highway(s)
 - County road(s)
 - Public Access Road(s)
- Commercial Development
 - Business, agricultural/ranching

Compartment 5, Part 2: Maple Forest Township.

Compartment Values are characterized:

- Recreation: Undeveloped average recreation use **(Low)**
- Administrative: Few or no administrative sites **(Low)**
- Wildlife/Fisheries: Relatively insignificant habitat **(Low)**
- Range Use: Little or no range use **(Low)**
- Watershed: Stream Class I, II. Rocky, little riparian vegetation. No specific water use. Low hazard. **(Moderate)**
- Forest/Woodland: Standing timber/woodland on 26 - 50% of area **(Moderate)**
- Plantations: 15% or less of area in or programmed for plantations **(Low)**
- Private Property: Threat to structures and property **(Moderate)**
- Cultural Resources: Minimal archaeological/historical findings, potential for Native American use **(Moderate)**
- Special Interest Areas: No Special Interest area within or adjacent to the area **(Low)**
- Visual Resources: Maximum modification dominates **(Low)**
- T&E Species: Species present **(High)**
- Soils (Erosion): Moderately erodible (EHR 4-12) **(Moderate)**
- Airshed: Low receptor sensitivity **(Low)**
- Vegetation: Potential for sensitive plants **(Moderate)**

Compartment 6, Part 1: Frederic Township.

Compartment 6 contains 46,240 acres in Fire Management Zone 01. Representative Locations (RLs) and the percent's in this Compartment are: 1 (100%). The characteristics of the compartment indicate that: **Catastrophic Fire Likely.**

Fuels Hazard characteristics are rated:

- Fuels (flame length produced): 8 + Feet **(High)**
- Crowning Potential: 6 + **(High)**
- Slope Percent: 0 - 20 **(Low)**
- Aspect: South **(High)**
- Elevation: 0 - 2000 **(Low)**

Protection Capability ratings are:

- Initial Attack: 0 - 20 minutes **(Low)**
- Suppression Complexity: Average **(Moderate)**

Ignition Risk factors include:

- Population Density - Wildland Urban Interface
 - 1001+ Dwellings/structures
- Power Lines In Unit
 - Transmission Lines
 - Distribution Lines
 - Sub-station
- Industrial Operations
 - Active timber sale
 - Debris/slash burning
- Recreation
 - Off-highway vehicle use
 - Dispersed camping areas, party areas, hunters, water based, hiking
 - Developed camping areas
- Flammables Present
 - Gas pumps or storage
 - Gas or oil wells/transmission
- Other
 - Fireworks, children with matches
 - Woodcutting area, power equipment
- Railroads
 - Railroads are present
- Transportation System
 - State/Federal highway(s)
 - County road(s)
 - Public Access Road(s)
- Commercial Development
 - Schools

Community Wildfire Protection Plan

Compartment 6, Part 2: Frederic Township.

Compartment Values are characterized:

- o Recreation: Undeveloped average recreation use **(Low)**
- o Administrative: High value or numerous administrative sites **(High)**
- o Wildlife/Fisheries: Moderately significant habitat **(Moderate)**
- o Range Use: Little or no range use **(Low)**
- o Watershed: Stream Class I, II. Rocky, little riparian vegetation. No specific water use. Low hazard. **(Moderate)**
- o Forest/Woodland: Standing timber/woodland on 51+% of area **(High)**
- o Plantations: 15% or less of area in or programmed for plantations **(Low)**
- o Private Property: Threat to structures and property **(Moderate)**
- o Cultural Resources: Minimal archaeological/historical findings, potential for Native American use **(Moderate)**
- o Special Interest Areas: No Special Interest area within or adjacent to the area **(Low)**
- o Visual Resources: Maximum modification dominates **(Low)**
- o T&E Species: Species present **(High)**
- o Soils (Erosion): Moderately erodible (EHR 4-12) **(Moderate)**
- o Airshed: Low receptor sensitivity **(Low)**
- o Vegetation: Plant occurrences of significance **(High)**

Compartment Assessment Ranking

Fuels Hazard

<u>Rating</u>	<u>Compartment</u>
Mod	6: Frederic Township.
Mod	4: Beaver Creek Township.
Mod	3: Lovells Township.
Mod	2: Grayling Township
Mod	1: South Branch Township.
Low	5: Maple Forest Township.

Protection Capability

<u>Rating</u>	<u>Compartment</u>
High	3: Lovells Township.
High	1: South Branch Township.
Mod	2: Grayling Township.
Mod	6: Frederic Township.
Mod	5: Maple Forest Township.
Mod	4: Beaver Creek Township.

Ignition Risk

<u>Rating</u>	<u>Compartment</u>
High	2: Grayling Township.
High	4: Beaver Creek Township.

Community Wildfire Protection Plan

Mod	1: South Branch Township.
Mod	3: Lovells Township.
Low	5: Maple Forest Township.
Low	6: Frederic Township.

Fire History

<u>Rating</u>	<u>Compartment</u>
High	2: Grayling Township.
High	1: South Branch Township.
Mod	4: Beaver Creek Township.
Mod	3: Lovells Township.
Low	6: Frederic Township.
Low	5: Maple Forest Township.

Values

<u>Rating</u>	<u>Compartment</u>
High	2: Grayling Township.
High	1: South Branch Township.
Mod	4: Beaver Creek Township.
Mod	3: Lovells Township.
Low	6: Frederic Township.
Low	5: Maple Forest Township.

Catastrophic Fire Potential

<u>Rating</u>	<u>Compartment</u>
High	6: Frederic Township.
High	4: Beaver Creek Township.
High	3: Lovells Township.
High	2: Grayling Township.
High	1: South Branch Township.
Low	5: Maple Forest Township.

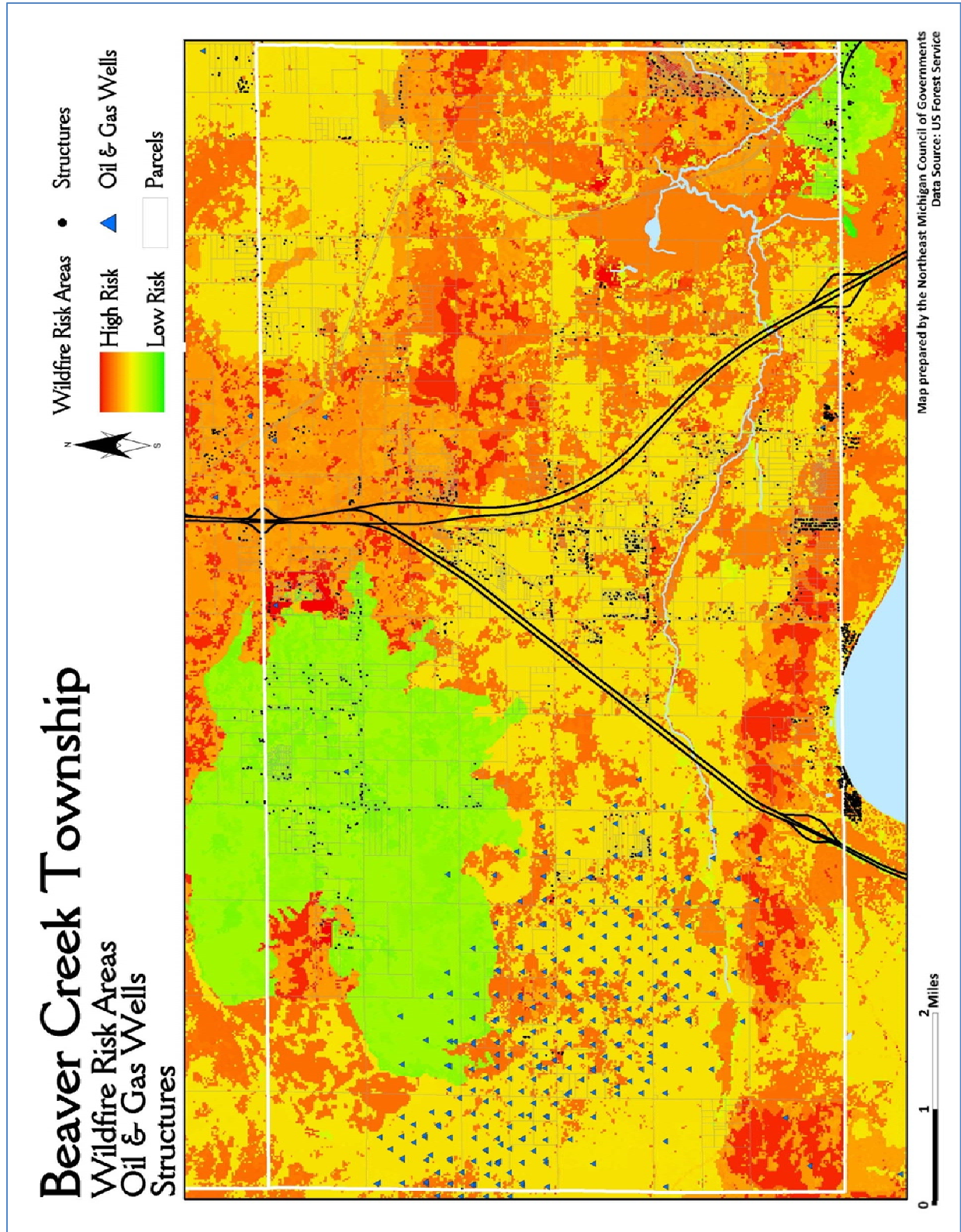
Compartment Assessment Ranking

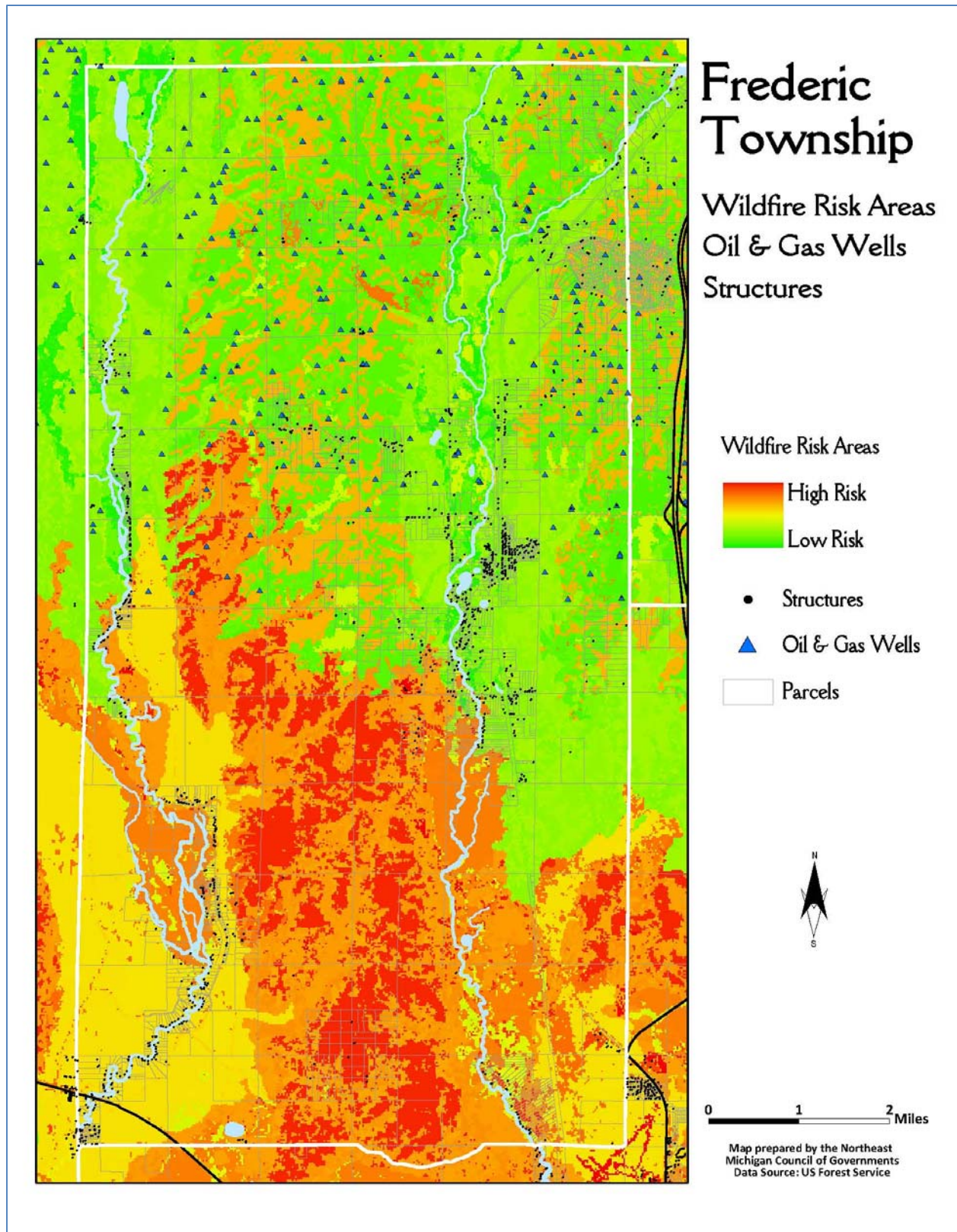
The end output of the RAMS analysis is a Composite Compartment Assessment Rating. Communities with high ratings include Grayling Township and South Branch Township. With further consideration of National Guard influences and resulting increased ignition sources, Lovells Township should have a high rating and Maple Forest a moderate rating.

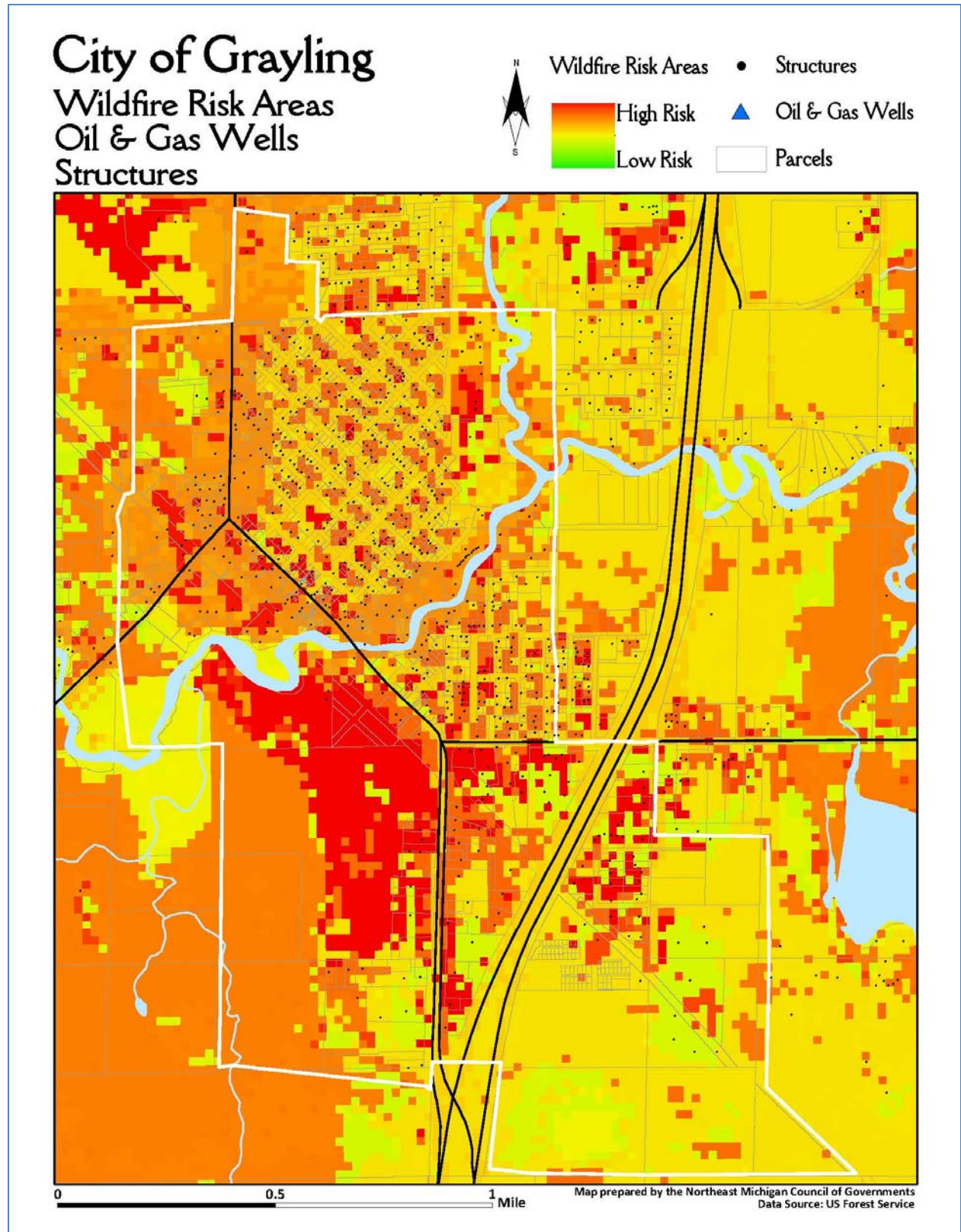
<u>Rating</u>	<u>Compartment</u>
High	2: Grayling Township.
High	1: South Branch Township.
Mod	4: Beaver Creek Township.
Mod	3: Lovells Township.
Low	6: Frederic Township.
Low	5: Maple Forest Township.

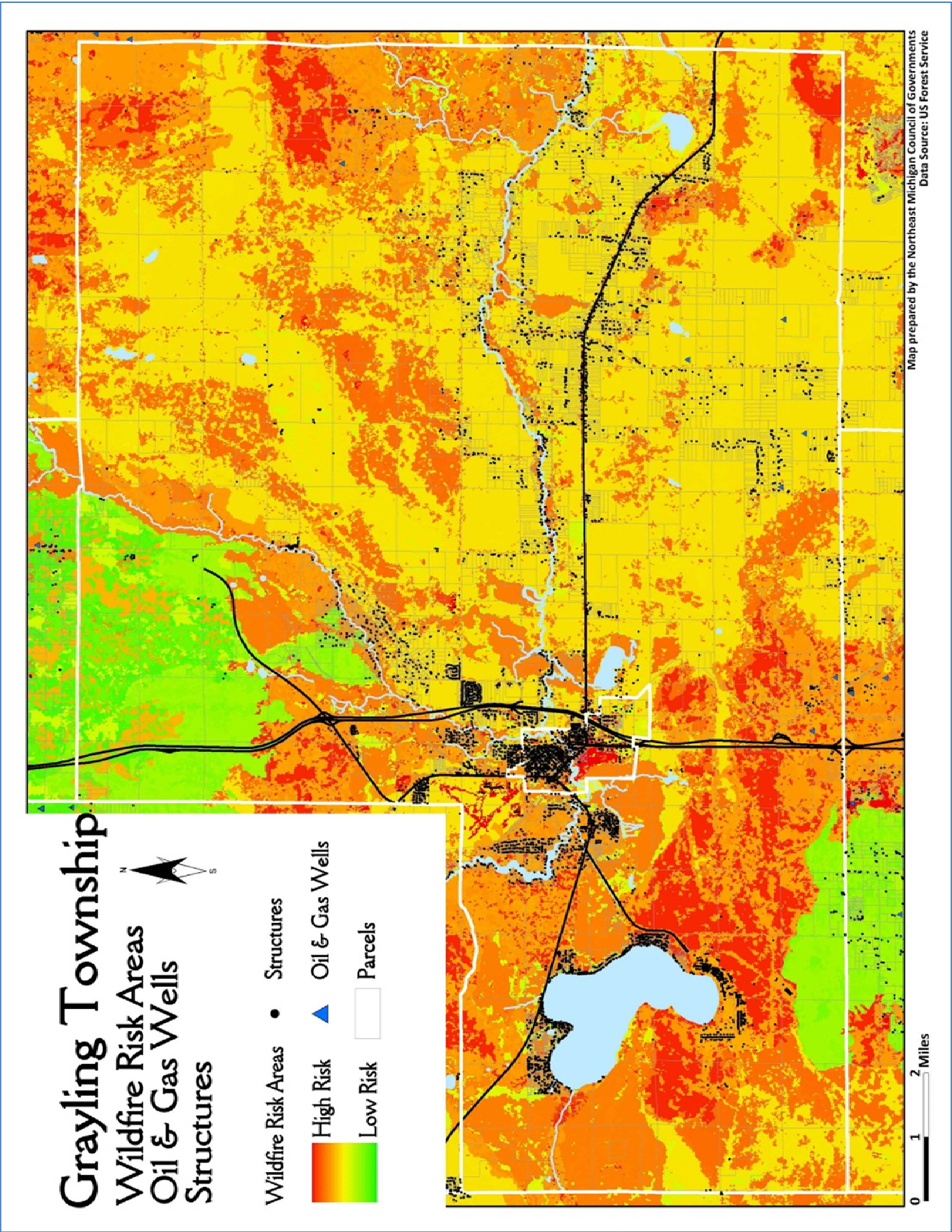
Community Vulnerability Maps

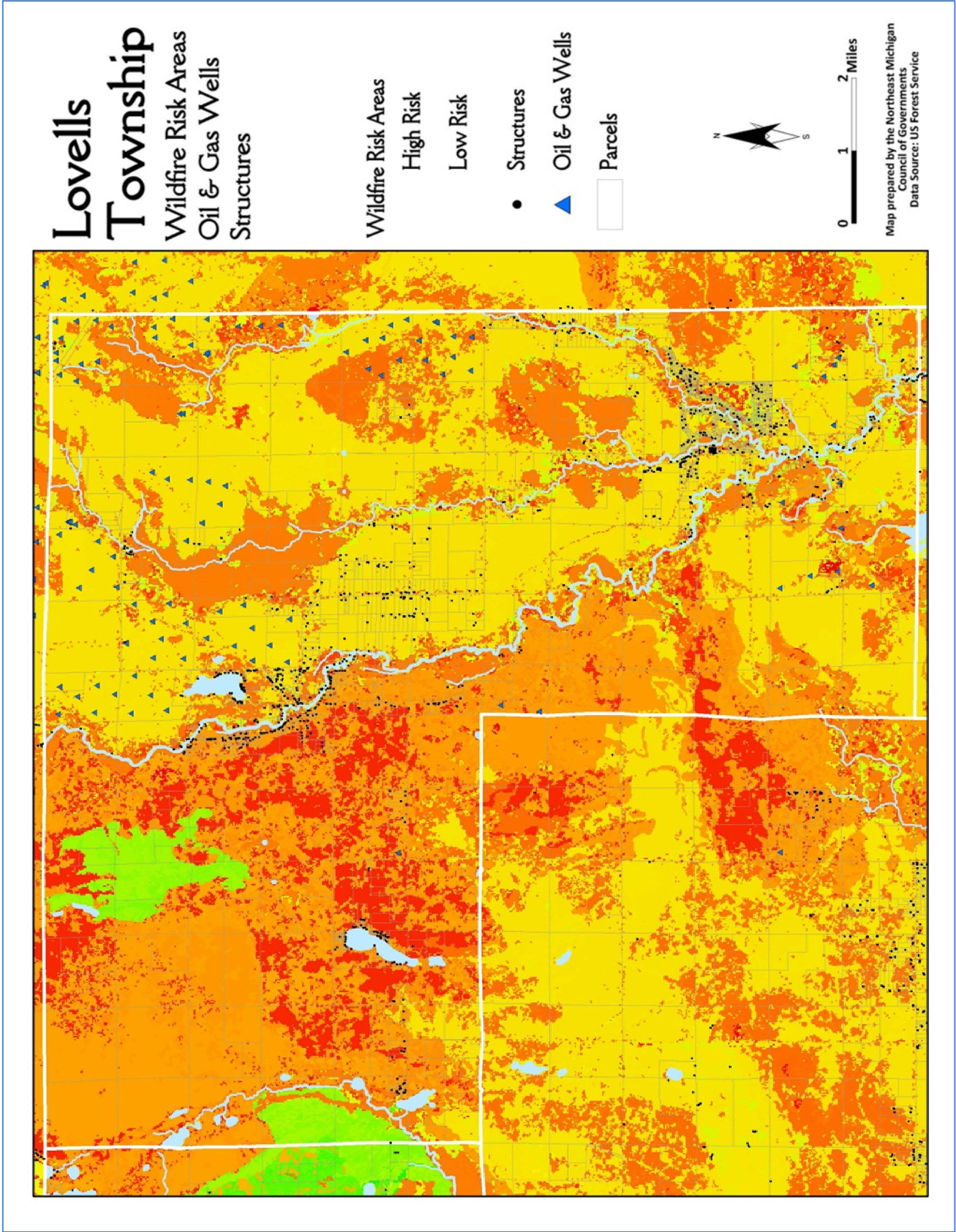
Ownership and structures data were overlaid onto wildfire risk maps to create risk and vulnerability maps. Maps of each community follow.



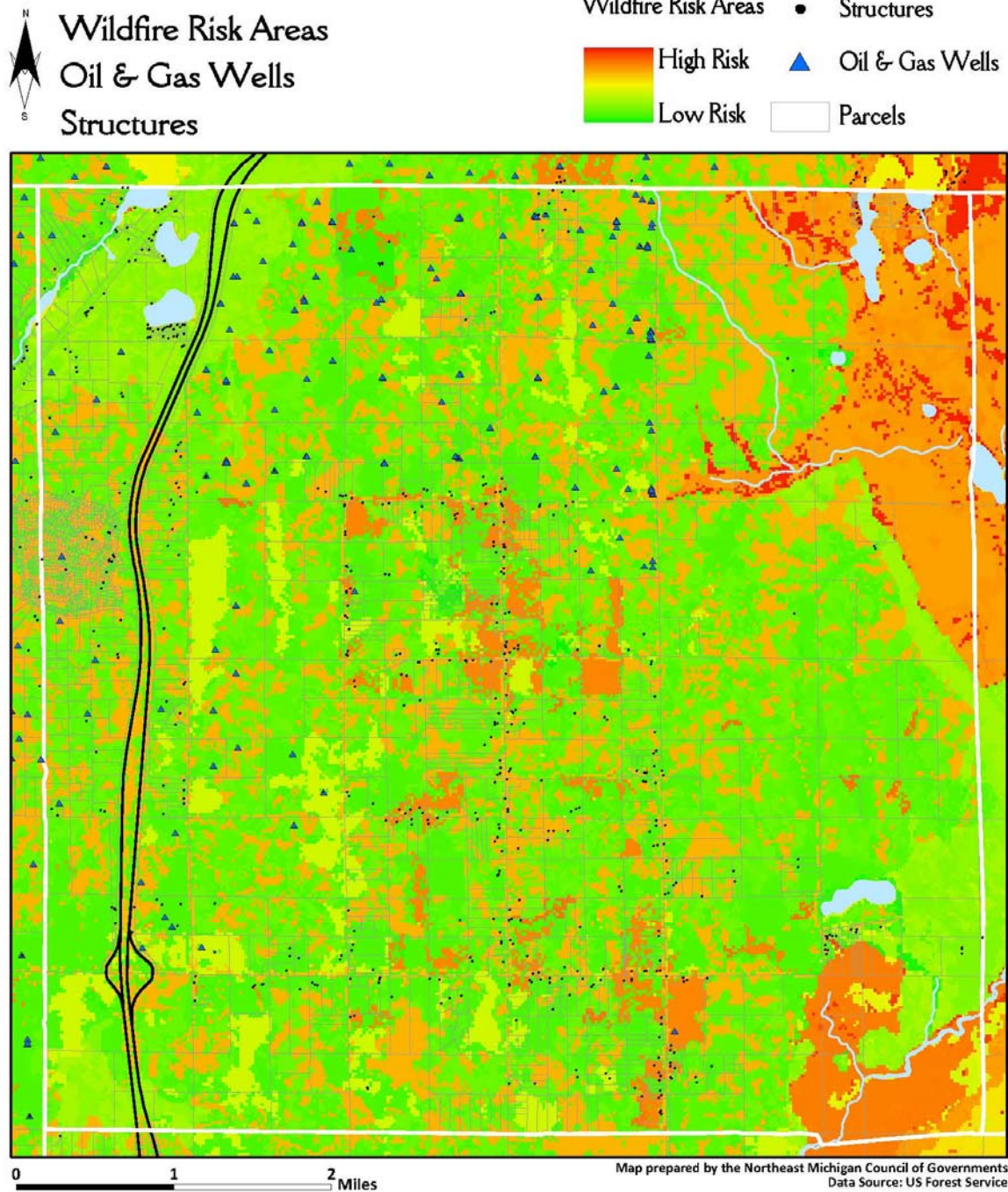


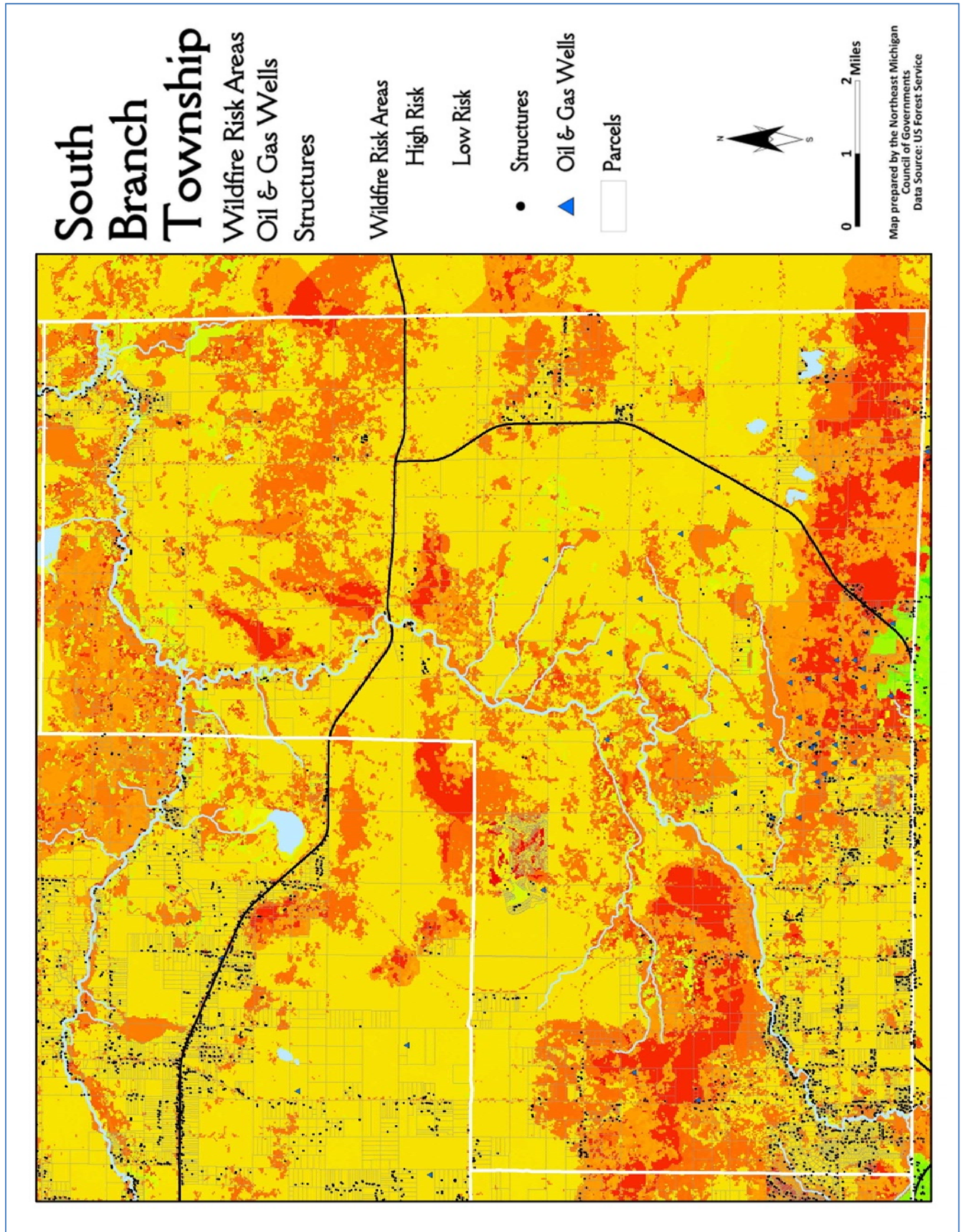






Maple Forest Township





Chapter 5

Mitigation Action Plan

Overview of Mitigation Strategies

According to the Michigan State Police Emergency Management and Homeland Security Division there are five basic hazard mitigation strategies.¹

Strategy #1 – Modify the hazard to remove or eliminate it. Modification will reduce its size or amount, or control the rate of release of the hazard. Examples include hazardous fuels reduction techniques such as prescribed burning, vegetation removal, vegetation clearing and/or thinning, slash removal and vertical clearance of tree branches.

Strategy #2 – Segregate the hazard to try to "keep the hazard away from the people." This can be done by creating defensible spaces around homes and improving ingress and egress to homes which could provide fuel breaks in areas of continuous fuels.

Strategy #3 – Limit development in locations where people and structures would be at risk. This approach seeks to "keep the people away from the hazard" and includes a variety of land use planning and development regulation tools, such as comprehensive planning, zoning, Firewise ordinances, capital improvements planning, disclosure laws, and the acquisition and relocation of hazard-prone properties.

Strategy #4 – Alter design and construction to make structures less vulnerable to disaster damage. Also known as "interacting with the hazard," it focuses on engineering structures to withstand potentially destructive impacts. Examples include incorporation of the Firewise Construction standards, retrofitting structures to install ignition resistant building materials, and retrofitting of ignition resistant building techniques including closed decks, balconies, and porches.

Strategy #5 – Early warning and public education to ensure that the public is aware of potential hazards, and that proper warning and communication systems are in place to save lives and protect property.

National Firewise Communities

The National Firewise Communities Program focuses on the relationships between Community Wildfire Protection Plans, Firewise Communities® planning, and hazard reduction considerations for the home ignition zone.

This method organizes the hazard assessment process into a series of steps that include:

- 1) selection of areas to be evaluated
- 2) hazard components to be considered in the assessment
- 3) ranking of hazard components

¹ Source: Local Hazard Mitigation Planning Workbook, MSP EMHSD, February 2003

Community Wildfire Protection Plan

4) compilation of hazard rankings into a usable format

The objective should be preventing ignition of structures; since water supplies, road width, and street signage are suppression issues and have little or nothing to do with preventing ignitions. The standard outlines the essential requirements for land use conversion that results in community design and development, including road widths and emergency vehicle accessibility, water supplies, topography, construction materials, and available fire protection strategies.

Planning, Zoning, and Capital Improvements Planning

Land-use planning and zoning are governmental functions critical to public safety-including fire protection. While building codes provide guidance on how to build in hazardous areas, planning and zoning activities direct development away from these areas, especially floodplains and wetlands.

- *Master Plans* provide guidelines for future development, while protecting the natural resources and community character. The plan looks into the future by providing goals, future land use plan and implementation sections. The Michigan Planning Enabling Act provides a community the authority to reduce hazards to life and property, which is the basis for incorporating Firewise principals into a zoning ordinance. The master plan should provide background information that identifies areas with wildfire concerns and support Firewise programs in the goals, future land plan, and implementation sections of the master plan. An analysis of all community master plans can be found in Chapter 3. Communities can review the analysis and when next amending their master plan, add recommended information. Finally, the master plan can be used to seek implementation grants, and support Firewise zoning and education programs.
- *Zoning* is considered one of the primary tools to implement a community master plan. As such, zoning provides communities a means to implement Firewise strategies for land use development, which, may include standards for:
 - private/public road construction
 - driveway standards
 - requirements for developments to have two egress/ingress roads
 - wildfire hazard overlay districts
 - use of defensible zones around structures and fuel breaks

The Michigan State University Extension Land Use Series, "Sample Wildfire Hazard Zoning" has four approaches to amending a zoning ordinance to mitigate hazards from wildfires. 1) Wildfire Hazard Education, 2) Wildfire Hazard Regulations to Ensure Property Access, 3) Wildfire Hazard Zoning through General Regulations, and 4) Wildfire Hazard Zoning as an Overlay District. These documents should be used by communities considering amending their zoning ordinance to support Firewise programs. Communities tend to be comfortable applying standards for roads, driveways, ingress-egress roads, street signs and house addresses. However, communities have not shown an interest in using wildfire hazard overlay zones and requiring defensible zones.

Community Wildfire Protection Plan

- Use of Planned Unit Development (*PUDs*) provides flexibility to incorporate Firewise development standards. In high risk areas, PUD standards should include use of defensible zones, fuel breaks, road and driveway design, signage for street identification, ingress and egress roads, underground utilities and vegetative maintenance for managing dangerous fuel loads in high fire risk areas.
- *Capital Improvement Plans* guide major public expenditures for communities by looking 5 years into the future. Capital expenditures may include creating access roads and fire breaks, hazardous fuels reduction projects including community vegetation management, vegetation removal, and vegetation clearing and/or thinning, and retrofitting existing public structures against wildfire, etc.

Building Codes

The International Code Council, Inc. (ICC) produces the International Urban-Wildland Interface Code®, last updated in 2018. The ICC is a nonprofit organization dedicated to developing single sets of national model construction codes. This ready to adopt wildland-urban interface code is for municipalities and county jurisdictions. The document provides for the minimum regulations for land use and development in wildland-urban areas. It covers the administration and authority of government, definitions, special building construction regulations, fire-protection requirements, and general requirements.

Firewise Construction Standards

The Firewise Construction Standards, 2015 International Wildland-Urban Interface Code, and 2018 International Fire Code set standards for new construction in the following areas:

- Ignition resistant building materials including fire resistant or non-combustible roof coverings, roof sheathing, roof flashing, roof skylights, roof and attic vents, roof eaves, gutters, siding, windows and screens, and fences and decks.
- Ignition resistant building techniques including closed decks, balconies, and porches to prevent debris and embers from collecting.
- Driveway access for fire apparatus.
- Vegetation plans for new residences and subdivisions that provide defensible space.
- Sprinkler system on structures over 5,000 square feet.
- Proper address labels for emergency response.
- Other restrictions on outdoor burning, outside storage.

Model wildfire code ordinances

Ordinance provisions fall into four categories: vegetative fuel clearance, building requirements, roadway and driveway standards, and planning and assessment. Communities are increasingly adopting or strengthening wildland fire ordinances to minimize wildfire damage.

The majority of community wildland codes address:

- 1) Vegetative fuel clearance around structures.
- 2) Vegetative maintenance.

Community Wildfire Protection Plan

- 3) Vehicular access requirements.

Primarily, these fire codes and ordinances attempt to reduce damage and the risk of possible injury for homeowners and firefighters in the WUI.

Wildfire mitigation may occur:

- 1) In the regulations for new and existing developments.
- 2) In the development review process.
- 3) In zoning, covenant or deed restrictions (requirements for fuel modification in high risk zones).
- 4) In building and construction standards.

Disadvantages to wildfire regulations include:

- 1) Potentially higher construction and maintenance costs for homeowners or associations.
- 2) Resistance to adopting regulations by homeowners.
- 3) Possibility of conflict with existing tree or natural resource ordinances.
- 4) Monitoring, administration, and enforcement costs.
- 5) Lack of guarantees that proper maintenance will be kept in the absence of administration and enforcement.

Technical and Financial Assistance

Property protection measures are usually considered the responsibility of the property owner. However, there are various roles the county or a municipality can play in encouraging and supporting implementation of these measures.

Providing basic information to property owners is an important action that can be taken to support property protection measures. Financial assistance for property owners can range from full funding of a project to helping residents find money from other programs. Outside funding sources for hazard mitigation include: FEMA, Michigan Economic Development Corporation, Michigan Department of Natural Resources, conservation organizations, and local governments.

Public Education and Awareness

Public education and awareness programs are necessary to periodically inform the public about the wildfire hazard and Firewise program in Crawford County. Information can be disseminated through the media (newspapers, newsletters, websites, television, radio, etc.) and at public forums and civic meetings. Presentations to schools and community groups along with sponsoring an information booth at community events are several ways to disseminate Firewise information.

Fire Prevention Activities by the US Forest Service

- 1) Planned fuel breaks will be completed as soon as time and funding allow. All fuel breaks will be maintained by hand, mechanical means, or prescribed burning on a three-to-seven year cycle or as funding allows. Maintenance may be done by the Forest Service or through a cooperative agreement with the VFD having jurisdiction in that area. Proposed fuel breaks will be considered/created as time and funding

Community Wildfire Protection Plan

allows. Maps showing the location of existing fuel breaks will be provided to the local VFD having jurisdiction in that area.

- 2) Management direction for Management Areas 4.2, 4.4, and 8.1 will be followed on National Forest Systems lands with regards to hazardous fuels reduction.
- 3) Scoping letters for proposed projects on National Forest System lands will include information about the Wyden amendment and how to participate in hazardous fuels reduction activities on their property in conjunction with the Forest Service. (This amendment allows the Forest Service to enter into agreements with landowners to do hazardous fuels reduction activities on their property if their property is adjacent to National Forest land.)
- 4) The Forest Service will consider/analyze requests by local Volunteer Fire Departments to locate water storage tanks on National Forest lands. (These tanks would be utilized to reduce turnaround time in refilling fire vehicles.) Analysis will follow existing NEPA protocol.
To the extent time and funding allows, the Forest Service will continue to assist the MDNR in training local fire departments.
- 5) The Forest Service will continue to maintain existing Forest Service fire prevention signs in Crawford County and will place new signs which will be located near the intersections of Sunrise Road and McMaster's Bridge Road, Chase Bridge Road and Pioneer Road, and Hunter Lake Road and F-97.
- 6) The Forest Service will jointly participate with the MDNR and/or VFD's in fire prevention activities, including but not limited to parades, informational booths at fairs and festivals, home inspections, fire prevention visits to schools, etc. as time and funding allows.
- 7) As requested by the local VFD's and as time and funding allows the Forest Service will create maps for the individual townships showing the location of hazardous fuels, and expected fire behavior in both normal and drought years.

Community Wildfire Protection Plan

Mitigation Action Plan

The above section identified a multitude of options for addressing hazard concerns. Not all of these options are economically feasible or appropriate for a county with limited resources and without professional in-house planning staff. Mitigation actions associated with wildfire hazards must focus on limiting the impacts on the populations or structures that are being affected.

The following recommended actions are presented according to the county's overall goal and objectives for wildfire hazard mitigation actions. There are several objectives and under each objective, several action items.

The overall goal of the Community Wildfire Protection Plan is to protect human life and reduce property loss due to catastrophic wildland fires in Crawford County.

Objectives

The following objectives and action items were identified to meet the goal of the Crawford County Community Wildfire Protection Plan:

<i>Objective 1:</i> Suppress wildfires using an appropriate management response in a manner compatible with Management Area Objectives.		
<i>Action Items:</i>	<i>Responsible</i>	<i>Year</i>
1. Adopt the National Incident Management System and incorporate NIMS principles into agency policies and procedures.	Local Gov., FD MDNR, USFS	Completed
2. Conduct National Incident Management System Incident Command Training for all emergency first responders and utilize Incident Command during disaster exercises.	Local Gov., FD MDNR, USFS	Ongoing
3. Utilize NIMS Incident Command principles in all emergency responses.	Local Gov., FD MDNR, USFS	Ongoing
4. Continue to use and update procedures to notify/evacuate campers and river users (canoes, kayakers, fishermen) from hazard areas. Current systems include Smart 911, Rave Mobile Safety System, and Integrated Public Alert & Warning System (IPAWS).	Local Gov., FD MDNR, USFS	Ongoing

Community Wildfire Protection Plan

Objective 2: <i>Encourage adequate fire prevention, fire-safe construction, and pre-suppression activities on private lands in Wildland Urban Interface areas (WUI) using Firewise Landscaping and Construction standards. The foundation of this objective will be building partnerships with the county, local units of governments, MDNR, USFS, MSUE and other interested organizations.</i>		
Action Items:	Responsible	Year
1. Communities and agencies should develop a partnership agreement that defines roles and responsibilities for each entity.	Local Gov., FD MDNR, USFS	Ongoing
2. Communities and agencies should adopt/endorse recommendations and strategies of the "Firewise" program via resolutions or letters of support.	Local Gov., FD MDNR, USFS	Ongoing
3. Communities and agencies will implement programs to educate landowners in the wildland/urban interface area to become acquainted with Firewise mitigation strategies to protect their property from wildfire hazards and to use Firewise principles of proper grounds maintenance, equipment storage, vegetation clearance and other techniques.	Local Gov., FD MDNR, USFS, MSUE	Ongoing
4. Representatives from local fire departments and agencies will be trained to conduct Firewise education programs and Firewise home assessments.	Local Gov. MDNR, FD USFS, MSUE	Ongoing
5. Local fire departments and agencies will pursue grants to purchase equipment and materials needed to conduct training and education programs.	Local Gov. MDNR, FD USFS, MSUE	Ongoing
6. Communities and local fire departments will encourage retrofitting of existing structures to install ignition resistant building materials including fire resistant or non-combustible roof coverings, roof sheathing, roof flashing, roof skylights, roof and attic vents, roof eaves, gutters, siding, windows and screens, and fences and decks.	Local Gov. FD	Ongoing
7. Communities, local fire departments and agencies will encourage retrofitting of ignition resistant building techniques including closed decks, balconies, and porches to prevent debris and embers from collecting.	Local Gov., FD MDNR, USFS	Ongoing
8. Communities, local fire departments and agencies will encourage creating defensible spaces around structures through the removal or reduction of flammable vegetation including vertical clearance of tree branches.	Local Gov., FD MDNR, USFS	Ongoing
9. Communities and local fire departments will work to create better ingress and egress to homes including clearance of trees along access roads, widening access roads too narrow for equipment travel, and creating a turn-around at the home site.	Local Gov. FD	Ongoing
10. Communities and local fire departments will encourage improvement of private or public roads which could provide fuel breaks in areas of continuous fuels.	Local Gov. FD	Ongoing

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11. The county will continue to incorporate Firewise Construction Standards, International Wildland Urban Interface Code and International Fire Code into existing building codes, zoning ordinances, and community land use plans.	County, Local Gov.	Ongoing
12. Local units of government will develop a program to assist those with special needs with applying Firewise Mitigation Strategies.	Local Gov. FD	Grant availability
13. Utilize available State and Federal Programs for Wildfire Mitigation including, but not limited to FEMA's Hazard Mitigation Assistance Grant, Michigan Department of Natural Resources and Environment Community Wildfire Protection Grant Program, and Secure Rural Schools and Community Self-Determination Act Title III Funding.	Local Gov. County, FD	Ongoing
14. Local fire departments will provide opportunities for home owners to interact with wildfire experts through ongoing home evaluations.	MDNR, USFS, FD, MSUE	Ongoing
15. Provide Firewise education training to staff at all fire departments, who can in turn promote the program at community events.	FD, MDNR USFS, MSUE	Ongoing
16. Local fire departments will work together to develop a packet of Firewise information to be given to local real estate agents with contact information as well as recommendations on how to make your home and property more Firewise.	Local Gov. MSUE	Ongoing
17. Distribute Firewise construction handouts to homeowners.	County, Local Gov.	Ongoing

Objective 3: *Support the members of the Michigan Interagency Wildfire Prevention Association (MIWFPA) as a way to further the message of fire prevention.*

Action Items:	Responsible	Year
1. Local fire departments, MDNR and USFS will conduct Firewise public education campaigns and awareness programs to inform the public about the wildfire hazard in Crawford County, the measures necessary to minimize potential damage and injury, and what mitigation actions can be taken.	Local Gov. MDNR, FD, USFS, MSUE	Ongoing
2. Conduct <i>Assessing Wildfire Hazards in the Home Ignition Zone</i> training for local volunteer fire departments on a biennial basis. Last training was conducted in 2018.	FD, MDNR USFS, MSUE, Local Gov.	2020
3. Local fire departments will conduct home assessments in the Wildland Urban Interface communities and surrounding areas within their jurisdiction.	FD	Ongoing

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Objective 4: Continue to assist and encourage communities within the county to participate in the Community's Wildfire Protection Plan		
Action Items:	Responsible	Year
1. The Local Emergency Planning Committee (LEPC) will review the CWPP on an annual basis to monitor and assess whether the plan continues to meet the community's needs.	LEPC, Local Gov., MDNR, USFS, FD	January of each year
2. Activities associated with implementing the CWPP will be discussed at each Crawford County Fire Chiefs meetings. This will enable each community to share their accomplishments.	FD	Ongoing
3. Foster public, interagency, and interdisciplinary cooperation when identifying, developing, and prioritizing hazardous fuels mitigation measures annually.	Local Gov. FD, MDNR, USFS, MSUE	Ongoing
4. Work with communities on pilot projects such as brush disposal sites, Firewise mitigation projects, etc.	Local Gov. MDNR, FD, USFS	Ongoing

Objective 5: <i>Fuel Management - manage forests to maintain fuel loads within the range of natural specific ecosystem variability in order to minimize adverse effect to ecological and socioeconomic values.</i>		
Action Items:	Responsible	Year
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.	MDNR, USFS	*Ongoing
2. Maintain fuel breaks plan using GIS technology to identify needs, map potential fuel breaks and determine options to install fuel breaks and provide long term maintenance. The process identifies fuel breaks on public and private properties.	MDNR, USFS	*Ongoing
3. Implement fuel breaks plans to fund and develop various stretches of fuel breaks and to perform long term maintenance on them.	MDNR, USFS	*Ongoing
4. 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.	MDNR, USFS, FD, Local Gov.	*Ongoing
5. 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.	MDNR, USFS	*Ongoing
6. Reduce the potential for large crown fires in conifer species by reducing the occurrence of fuel ladders, increasing crown spacing, and decreasing density. The vegetation management program is the primary means by which this will be accomplished.	MDNR, USFS	*Ongoing
7. Regularly maintain existing and establish new fuel breaks to protect critical facilities, structures, and forests.	MDNR, USFS	*Ongoing
8. Use prescribed burning or clear cutting, where appropriate, to remove slash and regenerate forest stands.	MDNR, USFS	*Ongoing
9. Work toward establishing new fuel breaks on public lands	MDNR, USFS	*Ongoing

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that will strengthen existing and proposed mitigation strategies.		
*Note: due to fluctuating funding amounts, these activities will be completed as time and budgets allow.		

Objective 6: Implement Firewise planning and zoning strategies at the local level. Implementation of action items under this objective are the responsibility of each community. Furthermore, it is understood that each local unit of government will need to determine which action items will be acceptable and enforceable under their current program administration.		
Community Master Plan Action Items		Year
1. Natural Resource section: identify general forest types, high risk wildfire areas, steep slopes and hydric soils, and draughty soils.	As plans are updated per Michigan Planning Enabling Act (MPEA)	
2. Address Firewise Program in goals and objectives.	As plans are updated	
3. Future land use section: consider overlay zone or special issue area.	As plans are updated	
4. Zoning Plan section: identify zoning techniques for Firewise Community.	As plans are updated	
Zoning Ordinance Action Items		Year
5. Consider use of a Wildfire Overlay Zone in the zoning ordinance, whereby properties within the overlay zone will subject to additional standards to mitigate impacts of wildfires.	As zoning ordinances are amended	
6. Vegetative fuel clearance provision concerns the distance between heavy vegetation types and the proposed structures. a. The zone immediately adjacent to a dwelling is the area of maximum fuel modification and management and typically extends 30 feet from the structure. The second zone is a transition area to any adjacent woodland. This zone is managed for fuels between the woodland and a structure regardless of property ownership.	As zoning ordinances are amended	
7. Vegetative maintenance for managing dangerous fuel loads in high fire risk areas.	As zoning ordinances are amended	
8. Roadway and driveway standards to ensure access for large emergency vehicles. a. minimum road/drive widths b. minimum vertical clearance c. an appropriate surface material d. maximum grade e. turnaround distances and radii f. street identification g. premise identification h. develop land subs with a minimum of two egress/ingress roads i. culverts	As zoning ordinances are amended	
County Planning Commission		Year
9. The County Planning Commission will review annually all communities' master plan updates and zoning ordinance amendments completed over the previous year to monitor their implementation of the CWPP and incorporation of Firewise standards in local planning and zoning activities. Tables 3.2 and 3.3 of the CWPP should be reviewed and updated as	March of each year	

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communities implement the plan. The County Planning Commission will submit a brief report to be submitted to the LEPC, County Board of Commissioners and local units of governments.	
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Objective 7: Provide fire prevention and fire suppression to Camp Grayling base and Michigan National Guard properties in Crawford County.

Action Items:	Responsible	Year
1. The Michigan National Guard and Michigan Department of Natural Resources will meet annually to review and update the Memorandum of Understanding concerning fire prevention and suppression.	MDNR Michigan National Guard	Annually
2. Due to budget constraints, the Michigan National Guard may be able to provide seasonal wildfire coverage (March to November) with their staff. The Michigan National Guard intends to contract with local fire departments for structural fires on the base and the MDNR for fire suppression outside impact areas.	MDNR Michigan National Guard	Annually
3. The MDNR and the Michigan National Guard co-manage National Guard lands. The MDNR and Michigan National Guard will continue to work in cooperation to develop and maintain fuel breaks around impact zones and conduct prescribed burns as necessary.	MDNR Michigan National Guard	Annually

Objective 8: With homes and dispersed outdoor recreational facilities, such as campgrounds and canoeing, located within high risk areas, it is extremely important to provide mechanisms for informing people of wildfire risks and, when necessary, provide for evacuation to safe areas.

Action Items:	Responsible	Year
1. Continue to support and Smart 911, RAVE Mobile Safety System, and Integrated Public Alert & Warning System (IPAWS) to selectively notify homeowners in areas threatened by a wildfire.	County	Ongoing
2. Establish procedures for notifying campground and canoe liveries.	Local Gov. MDNR USFS	2019

Chapter 6 Implementation

State and local officials, law enforcement, emergency management, fire-fighting, first aid and health, local environmental, hospital, transportation personnel, broadcast and print media, community groups, and owners/operators of facilities are subject to the reporting requirements of SARA Title III.

Section 303 of SARA Title III requires that Local Emergency Planning Committees develop a comprehensive emergency response plan. The law lists nine elements that, at a minimum, must be included in this plan.

Local Government

Under the Healthy Forest Restoration Act, the local government officials are one of the three entities, along with local fire chiefs and the state forestry agencies, which must agree on the final contents of a Community Wildfire Protection Plan.

- Engage local community leaders and stakeholders in the planning process and along with local fire chiefs, provide local leadership in assessing community fire protection needs and determining the complexity of planning necessary.
- Enlist state and federal agency assistance and support for the planning effort.
- Ensure that the Community Wildfire Protection Plan is collaboratively developed. Local officials must meaningfully involve state government representatives, federal agencies that manage land in the vicinity of the community, and other interested parties.
- In conjunction with local fire chiefs, local government officials will clearly communicate to home and business owners their responsibility to reduce the ignitability of their homes and other structures and to create defensible space around them.
- Incorporate recommendations from the CWPP into local master plans and ordinances.

Local Fire Chiefs

The Healthy Forest Restoration Act requires local fire chiefs along with local government, U.S. Forest Service, and Michigan DNR to agree on the final contents of a Community Wildfire Protection Plan.

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- As trusted community members and leaders, take the lead in encouraging diverse local understanding of and support for the development of a Community Wildfire Protection Plan, in organizing the planning process, and in ensuring meaningful participation from other community leaders and diverse stakeholders.
- Use local fire protection expertise to lead the assessment of community fire protection needs and to determine the necessary complexity of fire preparedness and response planning.
- Local fire departments will pursue grants to purchase equipment and materials needed to conduct Firewise education programs and home assessments.
- In conjunction with local government officials, clearly communicate to home and business owners their responsibility to reduce the ignitability of their homes and other structures, and to create defensible space around them.
- Consider using The “Leaders Guide for developing a Community Wildfire Protection Plan”, developed by the International Association of Fire Chiefs (IAFC), to guide the process.

Michigan Department of Natural Resources

The Healthy Forest Restoration Act gives state foresters a unique and critical role by designating them as one of four entities, along with the U.S. Forest Service, local governments, and local fire authorities, who must agree on the final contents of the Crawford County Community Wildfire Protection Plan.

- To provide statewide leadership in encouraging local, state, federal, and nongovernmental stakeholders in development of the Crawford County Community Wildfire Protection Plan and facilitate the participation of state personnel in the development process.
- Through established relationships with local officials, local fire chiefs, state and national fire organizations, federal land management agencies, private homeowners, and community groups:
 - Assist in bringing together diverse community partners.
 - Initiate the planning dialogue, if necessary.
 - Facilitate the implementation of priority actions across ownership boundaries.
- Bring specialized natural resource knowledge and technical expertise into the planning process.

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- Provide statewide leadership in developing and maintaining a list, or map, of communities at risk within the state and work with partners to establish priorities for action.
- When allocating federal grant funds (such as the mitigation portion of State Fire Assistance) for projects on nonfederal lands, to the maximum extent possible give priority to communities that have adopted a Community Wildfire Protection Plan.

USDA Forest Service

Provide federal leadership in encouraging Crawford County to develop a Community Wildfire Protection Plan.

- Convey the importance of Community Wildfire Protection Plans to federal line officers and encourage their active participation in their development and implementation.
- In planning fuel reduction projects on federal land:
 - Ensure full collaboration with local communities, state agencies, and all interested parties
 - Give priority to projects that provide for the protection of at-risk-communities or watersheds, or that implement recommendations in a Community Wildfire Protection Plan.
- Bring specialized natural resource knowledge and technical expertise into the planning process, particularly in the areas of GIS and mapping, vegetation management, assessment of values and risks, and funding strategies.
- Assist the community in identifying and prioritizing areas for hazardous fuel reduction treatments on federal lands and in determining the types and methods of treatment that, if completed, would reduce the risk to the community.
- Provide funding priority to projects and activities identified in a Community Wildfire Protection Plan.

Fire Prevention/Hazardous Fuel Reduction Activities in Crawford County on Forest Service Lands

- Forest Service activities within Management Area 4.2 will continue to emphasize activities that included reducing life-threatening and property-damaging wildfire potential.
- Forest Service activities within Management Area 4.4 will continue to emphasize activities that included reducing life-threatening and property-damaging wildfire

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potential and emphasize hazardous fuels treatment in wildland urban interface and intermix areas.

- Forest Service activities within Management Area 6.1 will continue to emphasize activities that included reducing life-threatening and property-damaging wildfire potential.

The following guidelines will be followed per Forest Plan direction:

- Constructed fuel barriers will be no longer than eight miles in length and temporary or permanent openings will be limited to no more than 500 acres.
- Activity fuels (slash) will be treated to a level commensurate with the allowable fire intensity and rate of spread that meets resource objective in established prescriptions. Treatment along highways and adjacent properties will meet applicable state laws.
- Management action to address high fuel hazards may occur in old growth when public safety and property are at risk.
- The Forest Service will continue to inform the public of proposed vegetation management activities on National Forest lands through legal notices and scoping letters. The scoping letter will include information about the Wyden amendment which allows the Forest Service to enter into agreements with private landowners to do hazardous fuels reduction activities on their property if their property is adjacent to Forest Service property.
- The Forest Service will continue to maintain existing fuel breaks on Forest Service lands.
- Proposed, but not yet completed fuel breaks on Forest Service lands will be completed and subsequently maintained.
- The Forest Service will continue to work with the fire departments having jurisdiction within the Forest Service boundary to plan, construct, and maintain strategically placed fuel breaks and water sources.

Michigan National Guard

Fire suppression and fire prevention is provided by local units of governments and the Michigan Department of Natural Resources under a cooperative agreement.

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Michigan State University Extension

MSUE Firewise provides educational programs to individuals and groups on how to protect their homes and buildings from wildfires. They will also provide educational articles suitable for reproduction in newspapers, newsletters, etc.

Community Events

Local fire departments, in coordination with the MDNR and USFS, will attend community events to promote the Crawford County Community Wildfire Protection Plan. The primary focus will be to encourage use of Firewise principles to protect structures from wildfires.

Table 6.1 Community Events	
Location	Event or Organization
Lovells Township	Bridge Walk Historical Society Hook and Trigger Club KP Lake Association
South Branch Township	Community Firewise Day
Maple Forest and Frederic Townships	Music Fest
Grayling Township and City	Au Sable River Festival Car Tours Grayling Farm Market Garden Club Senior Center
Beaver Creek Township	Community Picnic
Hartwick Pines State Park	Black Iron Days Wood Shaving Days Maple Syrup Days Forest Fest
Roscommon	Firemen's Memorial Festival Riverfest
Multi-Communities	Au Sable Watershed Committee Manistee River Restoration committee Huron Pines RC&D Council Manistee River Homeowners Association Au Sable River Homeowners Association North Branch Au Sable R. Association