

Crawford County



Adopted in 2013

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 COMMUNITY WILDFIRE PROTECTION PLAN

Prepared by:

Crawford County Wildfire Committee
U.S. Forest Service
Michigan Department of Natural Resources
Northeast Michigan Council of Governments

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Michigan Department of Natural Resources

Acknowledgements

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Prepared in 2013

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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 2.1**).

Crawford County is approximately 30 miles from Lake Michigan and approximately 55 miles from Lake Huron. It 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 558 square miles and a population of 14,273. Its population density is 25.6 people per square mile.

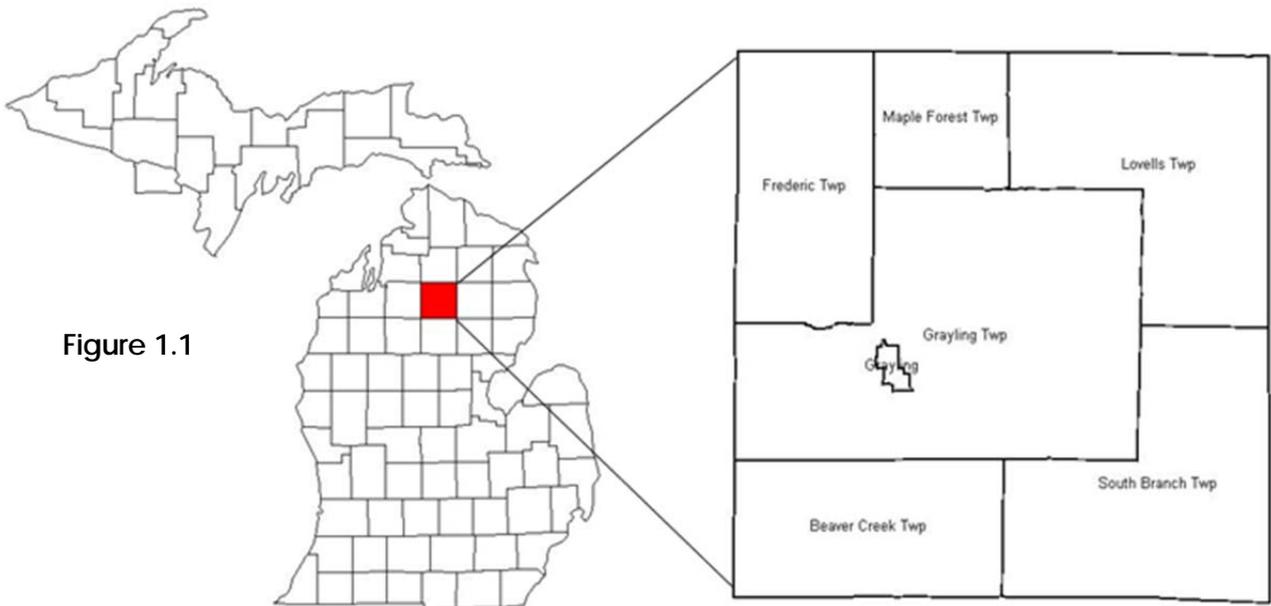


Figure 1.1

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 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.

Purpose

The purpose of the Crawford County Community Wildfire Protection Plan is to protect human life and reduce property loss due to catastrophic wildland fire 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; 4) and 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 is currently being updated.

Both 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.

Planning Context

The National Fire Plan developed in 2001, and the Healthy Forests Restoration Act enacted in 2003 has enabled hundreds of communities across the US to develop community fire plans, engaged 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 rational 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) as described in the Healthy Forest Restoration Act of 2003 (HFRA) 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 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 contacted the Northeast Michigan Council of Governments (NEMCOG) and requested their assistance with development of the CWPP. Crawford County submitted a grant application to the Michigan Department of Natural Resources' Michigan Communities at Risk program to request funds for development of a Community Wildfire Protection Plan. Funds were approved in January of 2012.

Crawford County Emergency Management

The Crawford County Emergency Management Office is responsible for preparing for and protecting against loss of life and disruptions to the economy from natural disasters,

technological hazards, and terrorist attacks. Ensuring the safety of Crawford County’s citizens and visitors and maintaining its economic well-being is a high priority of the county. Focusing preparedness efforts on the national and state preparedness priorities, Crawford County Emergency Management is working in partnership with government officials at the federal, state, and local levels, and the public sector to ensure that Crawford County is better prepared to prevent, protect against, respond to, and recovery from any disaster, be it a natural disaster, technological incident, or act of terrorism.

Local Emergency Planning Committee

The Local Emergency Planning Committee (LEPC) is made up of representatives from government, law enforcement, civil defense, fire-fighting, first aid and health, local environmental, hospital, transportation personnel, broadcast and print media, community groups and owners/operators of facilities subject to the reporting requirements of SARA Title III. In accordance with Section 303 of SARA Title III, the Local Emergency Planning Committees is required to develop a comprehensive emergency response plan.

The LEPC also functions as the County Hazard Mitigation Planning Committee. Within this role, the Community Wildfire Protection Plan was developed under direction of the Crawford County Local Emergency Planning Committee, in conjunction with a Wildfire Planning Committee.

Wildfire Committee

The Wildfire Committee began meeting in 2011. Representatives from the US Forest Service and Michigan DNR provided information Community Wildfire Protection Plans. The committee decided to pursue development of a CWPP for Crawford County. The Wildfire Committee met several times during the planning process to review activities and draft plan sections. Representatives from the Wildfire Committee attended the Crawford County LEPC’s quarterly meetings to present their findings.

| Table 1.1: Crawford County Wildfire Committee | |
|--|--|
| <i>Name</i> | <i>Representing</i> |
| Dave Stephenson | Crawford County Board of Commissioners |
| Dennis McClure | MSU Extension |
| Doug Pratt | Frederic Township Fire Department |
| Ernie Windolph | South Branch Township Fire Department |
| Joe Duran | Crawford County Building Department |
| Kathi Moss | Crawford County Local Emergency Planning Committee |
| Larry Akers | Crawford County Emergency Management |
| Mike Janisse | Michigan Department of Natural Resources |
| Paul Forrest | US Forest Service |
| Paul Lyden | US Forest Service |
| Russ Strohpaull | Grayling Fire Department |
| Paul Kollmeyer | Michigan Department of Natural Resources |
| Ed Holtcamp | Beaver Creek Fire Department |
| Richard Deuell | Northeast Michigan Council of Governments |

Crawford Wildfire Committee met eight times during the development of the plan. Plan sections were presented to the Crawford County Local Emergency Planning Committee (LEPC) on April 14, 2012 and on July _____. Additionally, the completed plan was discussed and recommended for approval to the County Board of Commissioners on _____. The County Board of Commissioners approved the plan on _____, 2013.

The Crawford County Community Wildfire Protection Plan has been 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.

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.

Chapter 2 Existing Conditions

Population

The 2010 Census showed that Crawford County had 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. a steady growth in population until the latter part of the 2000's. Population is concentrated in the City of Grayling and Grayling Township area with other population centers located in South Branch, Beaver Creek and Frederic Townships.

Further examination of the demographics shows Crawford County's population is aging at a higher rate than the State and Nation. Shifting population bases create new demands on community services and emergency response.

Population by Municipality

Beaver Creek, Lovells, Maple Forest and South Branch Townships experienced population growth over the past decade. The City of Grayling, Frederic and Grayling Townships experienced population declines and 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.

| Municipality | 2000 Population | 2010 Population | Percent Change | Numeric Change |
|-----------------------|-----------------|-----------------|----------------|----------------|
| Crawford County | 14,273 | 14,074 | -1.4% | -196 |
| City of Grayling | 1,952 | 1,884 | -3.50% | -68 |
| Beaver Creek Township | 1,486 | 1,736 | 16.80% | 250 |
| Frederic Township | 1,401 | 1,341 | -6.10% | -87 |
| Grayling Township | 6,516 | 5,827 | -0.10% | -658 |
| Lovells Township | 578 | 626 | 8.30% | 48 |
| Maple Forest Township | 498 | 653 | 3.90% | 154 |
| South Branch Township | 1,842 | 2,007 | 9.0% | 165 |

Source: U.S. Bureau of the Census
 Note: Red text indicates decline and green text indicates increase

Seasonal Population

Obtaining accurate numbers of seasonal residents and tourists is difficult. Because 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 Weyerhaeuser AuSable River Canoe Marathon in July can attract as many as 50,000 people to 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 that there were 4,535 seasonal housing 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 on 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 has increased from 34.7 years in 1990 to 47.7 years in 2010. At the same time the State's median age increase from 32.5 to 38.9 years. The difference in median age between the County and State increased from 1990 to 2010 as the County's population make-up "ages" at the faster rate, **Figure 2.2**

In conclusion, shifts in the County's demographic make-up are changing the population structure. Long term trends in the increase in median age continue at the faster rate than the State of Michigan and US. The rate has increased with the down turn in the economy, as young families move to other areas for employment. An aging population needs access to social and medical services. The county's emergency response services will experience an increase in demands.

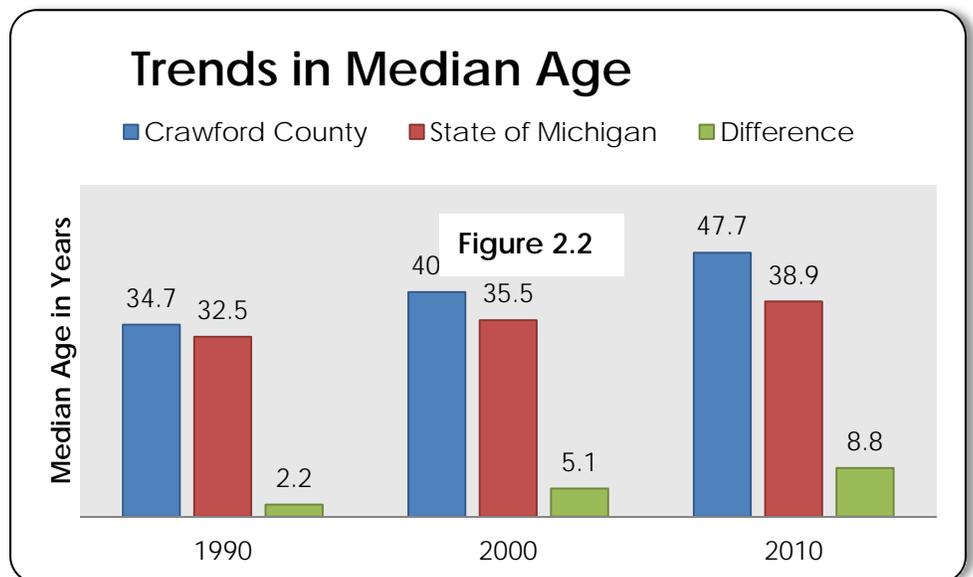
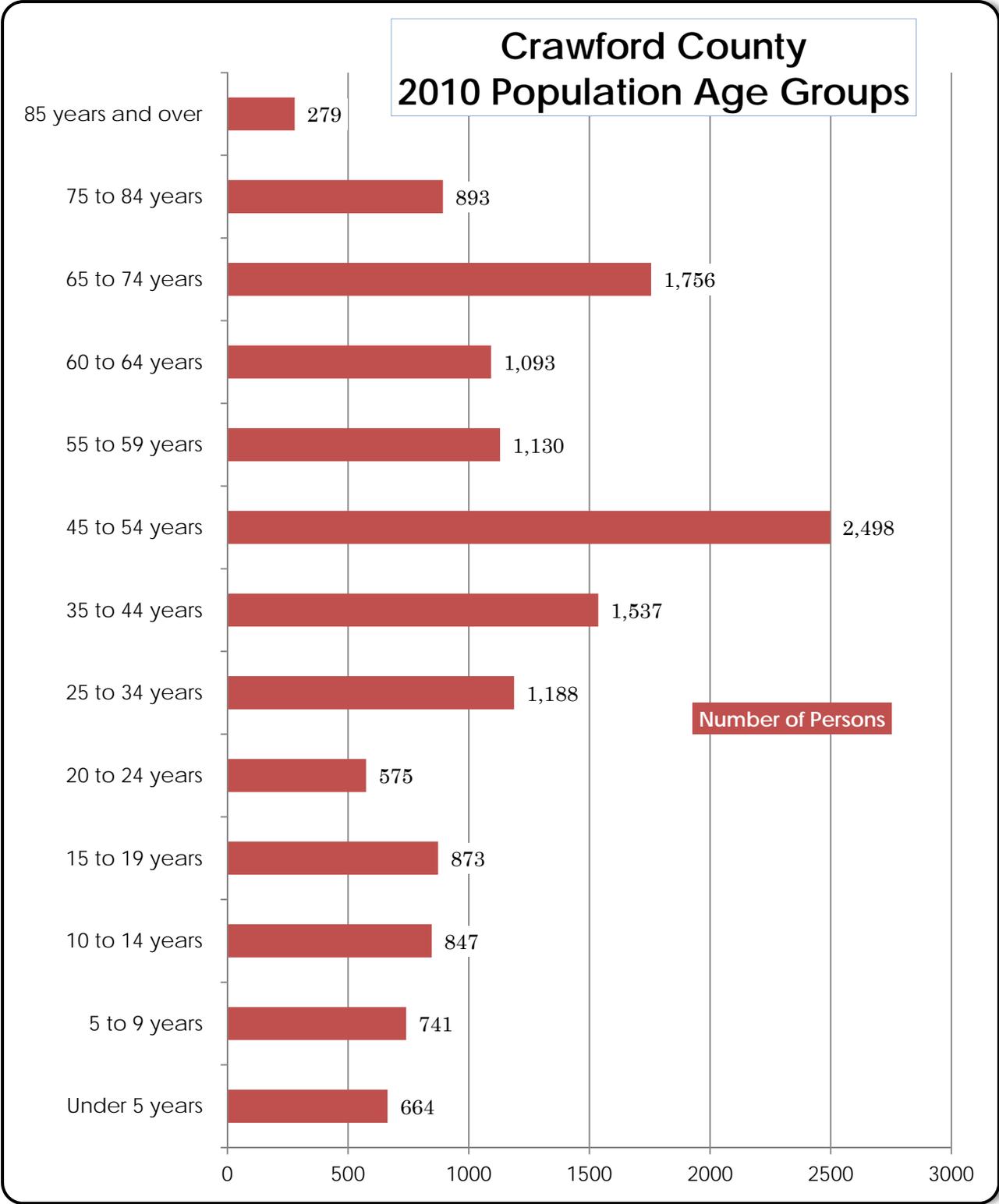


Figure 2.1



**Table 2.2
Age Distribution By Municipality For Crawford County - 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 down turn 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.

| 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% |

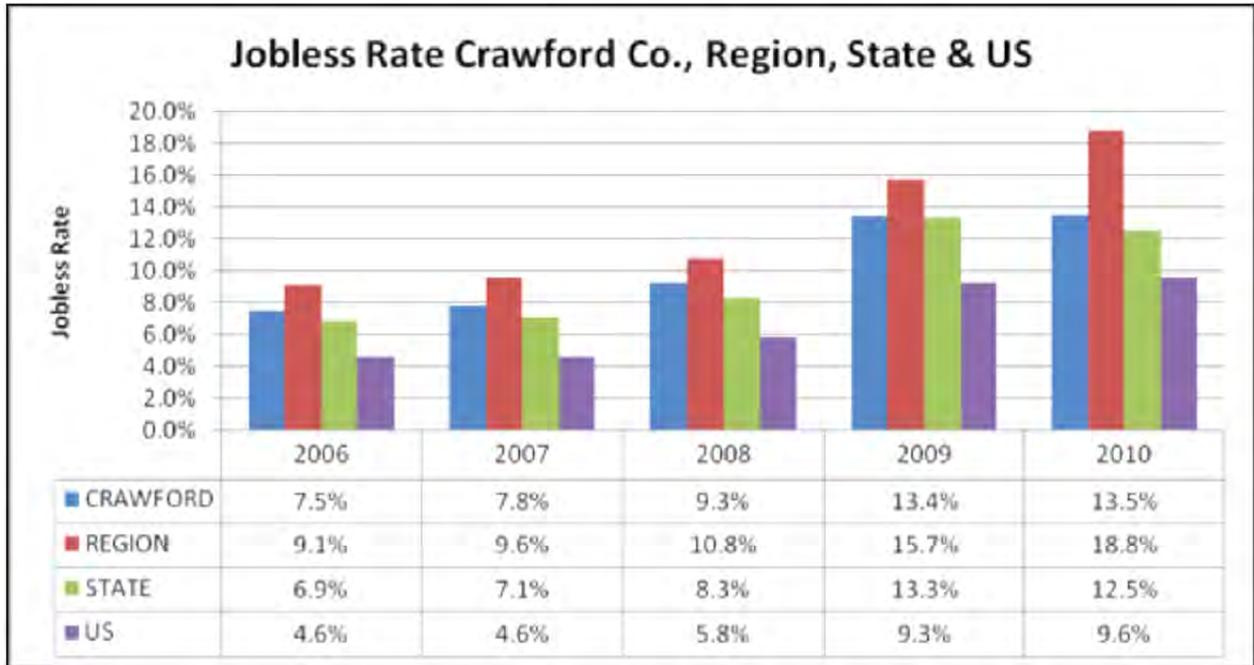
Source: US Census Bureau

Selected Economic Indicators for Crawford County, MI

In Crawford County, 2010 Census data shows a loss in population levels over the last decade. The number of people in the labor force and employment has also dropped from 2004, as well the unemployment rate has increased. In 2009, Crawford County was 293 in the nation (of the 3144 counties) with the highest unemployment rate. The unemployment rate for the county has been consistently lower than region-wide rates. The median household income has remained relatively stable, showing a small drop from 2000 to 2010. Poverty rates have also increased in recent years. See **Table 2.4**. **Figure 2.3** shows the jobless rate for Crawford County, Northeast Michigan, Michigan and US. The County’s employment was lower than the NEMCOG region’s overall rate, but consistently higher than the state and US.

| Table 2.4 Select Demographics and Economic Indicators | | | |
|--|--------|--|----------|
| Population (2010) Estimate | 14,074 | Median Household Income (2007) | \$35,979 |
| Labor Force (2010) | 6,292 | Median Household Income (2009) | \$35,866 |
| Employment (2010) | 5,441 | Adults over 25 (2007) % Bachelor’s Degrees | 12.9% |
| Unemployment Rate (2010) | 13.5% | Poverty Rate (2007) | 14.7% |

Figure 2.3



Community Services and Critical Infrastructure

Adequate public and private infrastructure (roads and utilities) and public facilities and services are essential elements of modern life. The cost to construct new infrastructure and facilities and to maintain services is enormous. The costs together with the area's changing population and ever changing technologies associated with many of these items makes planning for future needs imperative. While the County encompasses 562 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.

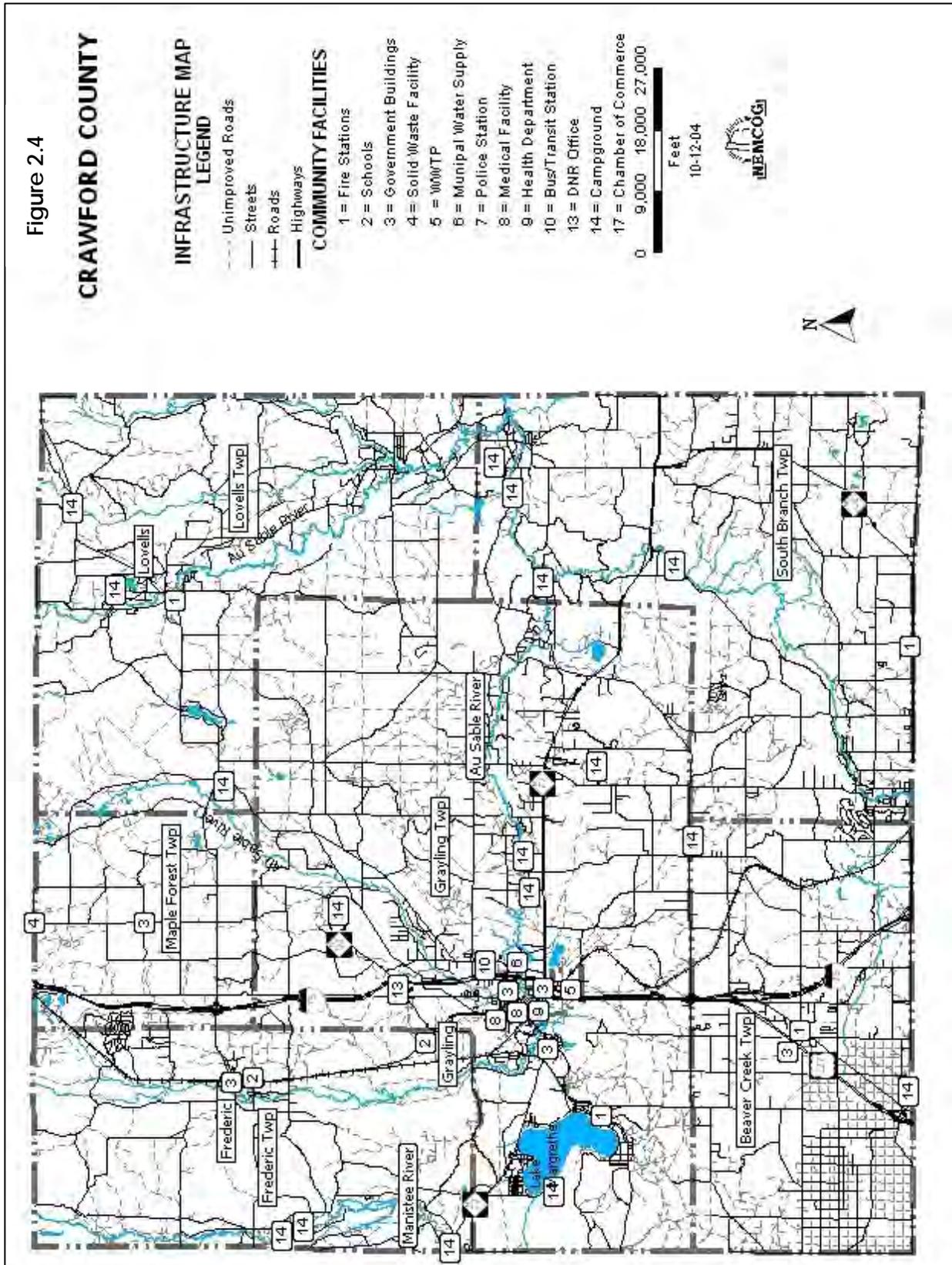
County Government

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, telephone (989)-348-2841. The County is represented by Seven Commissioners. Secretary to the Board is Sandra Moore 200 W. Michigan Ave., Grayling, MI 49738, (989)-344-3200.

| District | Commissioner | Address | Telephone |
|---|---------------------------|---|----------------|
| 1 | Dave Wyman | 604 Peninsular, Grayling, 49738 | (989) 390-0833 |
| 2 | Sharon Priebe | PO Box 691, Grayling, 49738 | (989) 710-0337 |
| 3 | Shelley Pinkelman, V-Chr. | 3940 Manistee River Rd., Frederic, 49733 | (989) 344-4146 |
| 4 | Linda Munsey | 9285 Outing Place, Grayling, 49738 | (989) 348-5911 |
| 5 | Rick Anderson | 338 Red Tailed Hawk Loop, Grayling, 49738 | (989) 348-4809 |
| 6 | Dave Stephenson, Chair | 5478 Appleton, Grayling, 49738 | (989) 348-9678 |
| 7 | Phil Lewis | 707 Larson Ct., Roscommon, 48653 | (989) 275-5716 |
| Email the above at: First initial last name @crawfordco.org | | | |

| | |
|---|--|
| <p>County Controller Paul Compo 200 W. Michigan Ave., Grayling (989) 344-3202 pcompo@crawfordco.org Fax: (989) 348-5743</p> | <p>County Clerk/ Register Sandra Moore 200 W. Michigan Ave., Grayling (989) 344-3200 smoore@crawfordco.org Fax: (989) 344-3223</p> |
| <p>Treasurer Joseph Wakeley 200 W. Michigan Ave., Grayling (989) 344-3229 jwakeley@crawfordco.org Fax: (989) 344-3223</p> | <p>Sheriff Kirk Wakefield 200 W. Michigan Ave., Grayling (989) 344-3205 sheriff@crawfordsheriff.org Fax: (989) 348-6532 Jail Fax: (989) 344-8300</p> |
| <p>Emergency Services Larry Akers 202 W. Michigan Ave., Grayling (989) 344-3268 emd@crawfordsheriff.org Fax: (989) 348-6351</p> | <p>Transit Authority Julee Dean 4276 W. N. Down River Rd (989) 348-8215 Grayling, 49738 Fax: (989) 348-6631</p> |
| <p>Environ. Monitoring Paul Compo 200 W. Michigan Ave., Grayling (989) 344-3202 Fax: (989) 344-3258</p> | <p>MSU Ext. Service Linda Cronk 200 W. Michigan Ave., Grayling (989) 344-3264 Fax: (989) 344-3265</p> |
| <p>Conservation Dist. Ch. Walt Neilson PO Box 156, Roscommon, 48653 (989) 275-5231</p> | <p>Distr. 10 Health Dept. Kyle Anderson 202 Meadows Dr., Grayling, 49738 (989) 348-7800</p> |
| <p>Housing Commission Cy Wakeley 203 Huron, Grayling, 49738 (989) 348-3513 Fax: (989) 348-2958</p> | |

Figure 2.4



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, 7564 County Rd. 612, PO Box 78 Frederic, MI 49733, (989) 348-8778

Grayling 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, N. Sherman Rd. (mail to clerk), Frederic, MI 49733, (989) 348-5794

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

City of Grayling, 1020 City Blvd., Grayling, Michigan 49738, (989) 348-2131

Public Safety

Law Enforcement

Crawford County has two local law enforcement agencies, the Sheriff's Office, located at 200 W. Michigan Avenue in Grayling and the City of Grayling Police Department located at 1020 City Blvd. in Grayling. The County 911 system is a separate county function and is co-located in the Sheriff Department as well as the Crawford County Jail. Crawford County is patrolled by Michigan State Police Troopers assigned to the Houghton Lake Post and the Kalkaska Detachment. There are troopers that are 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.

Emergency Medical Services

Crawford County maintains Emergency Medical Services (EMS) throughout the county. 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 departments, providing fire protection service for the residents of Camp Grayling, but will assist fire departments in Crawford County if needed. **Table 2.5** provides a summary of fire and emergency services,

There are a total of nine Fire Departments located in Crawford County consisting of:

Frederic Township VFD, a partially paid fire department covering 108 square miles, and providing fire protection for approximately 1,994 persons. It is located on 6547 Frederic St., Frederic, MI. The Frederic VFD provides fire and emergency first responder services to

Maple Forest 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 8,468. 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 and Station 1-Frederic EMS. 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. 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 partially paid fire department covering 108 square miles, and providing fire protection for approximately 2000. It is located on 5245 N. M-18 Roscommon, MI. The mailing address is 5245 N. M-18, 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.

Beaver Creek FD, a partially paid fire department covering 72 square miles, and providing fire protection for approximately 2000. 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 \$262,247. 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: Fire suppression has been funded through the military. The Camp contracts with the Grayling Fire Department for structural fire suppression and has a seasonal crew for first response on wildfire suppression from March to November.

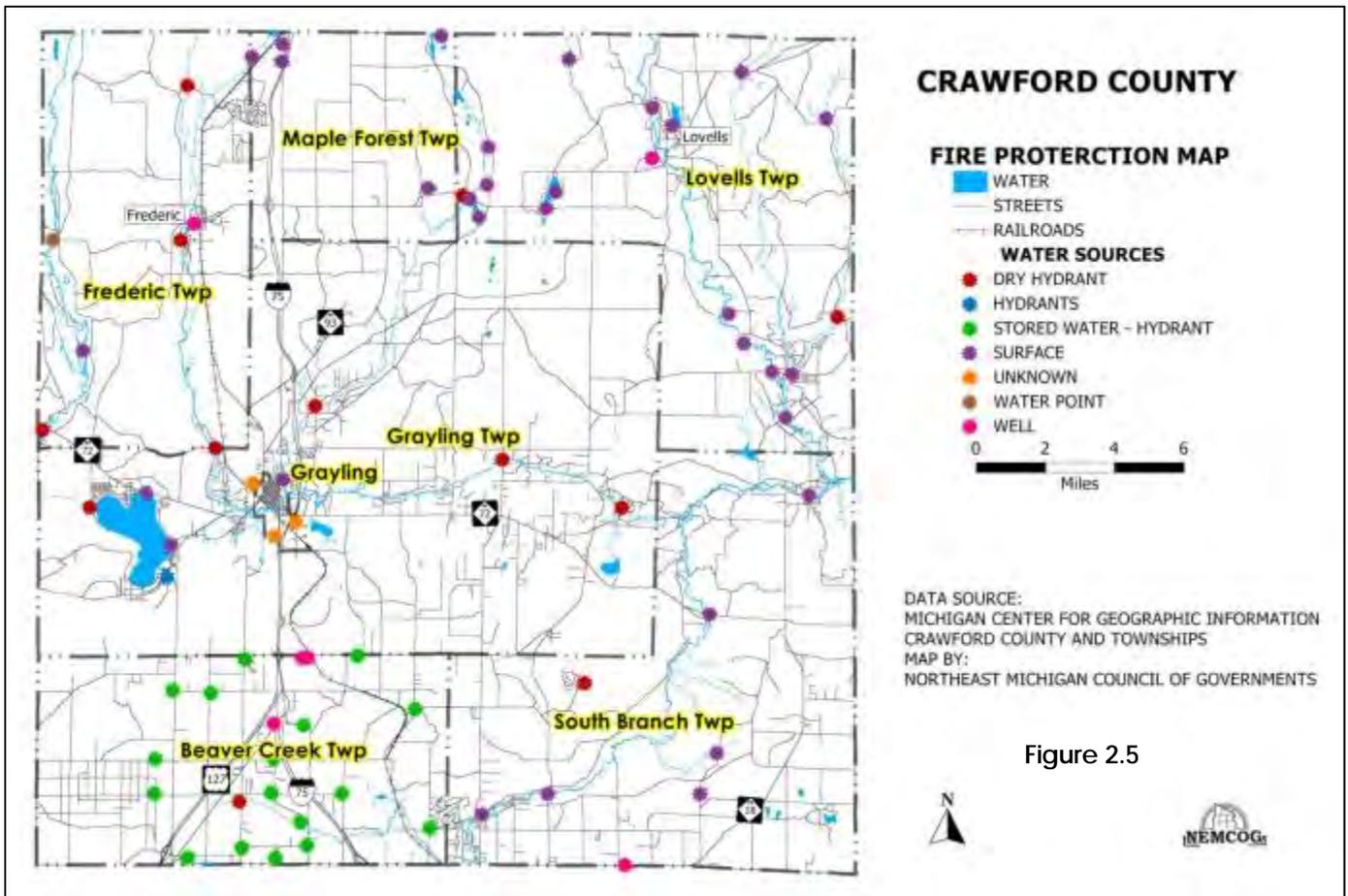
DNR Grayling Field Office is located on 1955 Hartwick Pines Rd., Grayling, MI 49738. Phone: (989) 348-6371. The northern two thirds of the county covered out of Grayling field office.

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

(Note: Camp Grayling Fire Departments primarily provide fire protection service to the residents of Camp Grayling but will provide fire protection to Crawford County if needed).

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 need 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 2.5**



| Table 2.5 Crawford County Fire Protection | | | | |
|---|----------------|----------------------|------------|--|
| Name | Type | Coverage (Sq. miles) | Population | Equipment/Staff |
| Frederic-Maple Forest FD 6547 Frederic St., Frederic | Paid-Volunteer | 108 | 1,287 | Staff: 30 full time or paid on call members Equipment: 1 brush truck 2 engines 1 tanker of 3,000 gallons 1 ORV with a 50 gallon tank of water 4 Advanced Life support ambulances. |
| Grayling City-Township 1041 City Blvd., Grayling | Partially-paid | 180 | 8,000 | Staff/Volunteers: 18 Equipment: Truck #220 – 2,000 Gallon Type 1 Tanker/Pumper Truck #221 – Type 2 Engine, 2 Person Cab Truck #222 – Type 1 Engine, 5 Person Cab Truck #230 – 2,000 Gallon Type 1 Tanker Truck #240 – Light Rescue Truck, Jaws/Ice Rescue Truck #250 – Water Point Truck, 275 GPM Trash Pump Truck #251 – 75' Type 1 Aerial/Engine, Jaws |
| 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 One (3,000 gallon capacity) Pumper Truck One vehicle assigned solely to medical response missions |
| South Branch Township M-18 Hwy., Roscommon | Partially-paid | 108 | 2,001 | Staff: 1 Full time Chief and 23 Paid on-call firefighters, 2 Paramedics, 14 EMT-B, 1 EMT-S, 1MFR Equipment: 1250 Gal. Main Engine 1250 Gal. Engine/2000 Gal. Tender 500 Gal. Tender/2000 Gal. 2000 Gal. Tender Water Point Truck Command/Echo Unit Light Brush Truck 300 Gal. |

COMMUNITY WILDFIRE PROTECTION PLAN

| | | | | |
|--|------|-----------------------|-------|---|
| | | | | 6X6 5 Ton Wild Fire Truck 6X6 2 ½ Ton Wild Fire Truck Basic Ambulance |
| Beaver Creek Grayling Rd., Beaver Creek Twp. | Paid | 72 | 2,000 | Staff and volunteers: The Department has five full time Responders and an additional six Paid On Call employees. Equipment: Unit 722 is a 1250 gpm / 1000 gallon Class A Apparatus. Unit 723 is a 1500 gpm / 1000 gallon Class A Apparatus. Unit 724 is a 1250 gpm / 1000 gallon Class A Apparatus. Unit 731 is a 50 gpm / 2000 gallon Tanker. Unit 740 is a Rescue vehicle Equipped with Medical First Response, Trench Rescue equipment and used to pull Hazmat Trailer or Snowmobile rescue 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 7 other fire line qualified firefighters Equipment: 2- Tractor-plows 1- Skidgine (Skidder) with 500gal of water and plow unit 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 5- fire line qualified firefighters Equipment: 1-Tractor plow 2 large water units 1 small water units |
| Source: | | | | |

Medical Facilities

Mercy Hospital Grayling is a 130 bed facility (90 acute care, 40 long term care) and is the largest medical facility in Crawford County. It is located on 1100 E. Michigan Ave., Grayling, MI 49738. Phone: (989) 348-5461. Troop Medical Clinic is located within Camp

Grayling and has minimal staff much of the year that attend to troop related medical issues, only during troop training does it have a full staff.

District Health Department #10 is often able to fill health care needs of the community. The Crawford County Branch is located on 220 Meadows Dr., Grayling, MI 49738, Phone: (989) 348-7800. 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.

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 persons. 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.

Utility Services

Due to the large amount of public land, utility services are lacking in some areas of the County. MichCon provides natural gas service for much of the County, a portion of Crawford County does not have natural gas service. 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, Phone: (989) 344-3500. 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, Phone: (989) 275-6600. **Table 2.6** provides a summary of school districts and schools servicing Crawford County.

| 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 | 100 Michigan Ave. Grayling, MI 49738 | Students: 712 Staff: 79 |
| Grayling Middle School Phone: (989) 344-3558 | 500 Spruce St. Grayling, MI 49738 | Students: 368 Staff: 43 |
| Grayling High School-Adult Ed Phone: (989) 344-3508 | 1135 N. Old-27 Grayling, MI 49738 | Students: 566 Staff: 55 |
| Roscommon Area Public Schools | | |
| School Name | Address | Students and Staff |
| Roscommon Elementary School (989) 275-6610 | 175 W. Sunset Dr. Roscommon, MI 48653 | Students: 510 Staff: 43 |
| Roscommon Middle School Phone: (989) 275-6640 | 299H W. Sunset Dr. Roscommon, MI 48653 | Students: 428 Staff: 44 |
| Roscommon High School Phone: (989) 275-6675 | 10600 Oakwood Dr. Roscommon, MI 48653 | Students: 474 Staff: 41 |
| Other Schools | | |
| School Name | Address | Students and Staff |
| Calvary Baptist Academy Phone: (989) 348-9220 | 6504 W. M72 Hwy Grayling, MI 49738 | Students: 20 Staff: |
| Source: NEMCOG | | |

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 importation to identify the location and needs of these facilities. See **Table 2.7**

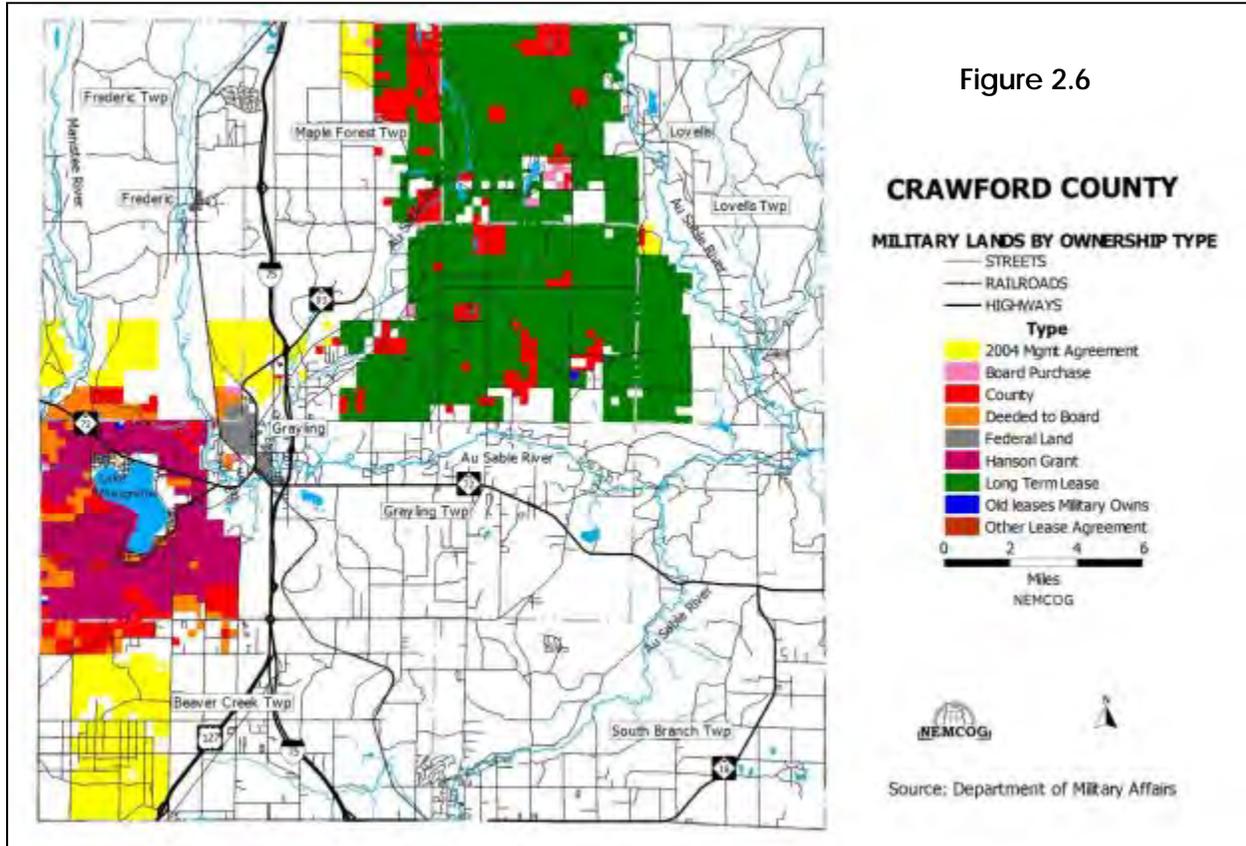
| Table 2.7 Special Populations | | |
|--|---|---|
| Nursing Homes | | |
| Name | Address | Information |
| Grayling Nursing Centre Phone: (989) 348-2801 | 331 Meadows Drive Grayling, MI 49738 | Beds: 120 Staff: 50 |
| Mercy Hospital-Grayling LTCU Phone: (989) 348-5461 | 1100 Michigan Ave. Grayling, MI 49738 | Beds: 40 Staff: 600 |
| Adult Foster Care/Assisted Living Facilities | | |
| Name | Address | Information |
| AuSable License Type: Small Group Phone: (989) 248-7603 | 1086 AuSable Trail Grayling, MI 49738 | Capacity: 6 Staff: 1-2 |
| Jones Lake Home License Type: Small Group Phone (989) 348-2461 | PO Box 2909, 3464 Jones Lake Grayling, MI 49738 | Capacity: 6 Staff: 1-2 |
| Wargos Manor License Type: Medium Group Phone: (989) 348-9647 | 808 Chestnut Grayling, MI 49738 | Capacity: 12 Staff: 1-2 |
| The Brook Phone: (989) 745-6500 | 503 Rose St. Grayling, MI 49738 | Capacity: 24 Apartments Staff: 10 |
| Source: NEMCOG | | |

Governmental Facilities (Camp Grayling)

Camp Grayling is an important component of the Crawford County community landscape. Camp Grayling, with its 147,000 acres, is the largest military installation east of the Mississippi River, and the nation's largest National Guard training site. 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 new "state of the art" Multi-Purpose Range Complex (MPRC) and a MATES facility that houses (527) tracked vehicles, including (77) M1 tanks. **Figure 2.6** shows lands under Camp Grayling's jurisdiction.

Training is conducted here 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 training resources. Training at Camp Grayling focuses on heavy vehicles and larger units.

Camp Grayling has 427 buildings for troop use located at both the main installation grounds and Grayling Army Airfield. Quarters available can house 725 officer and 6,144 enlisted personnel. In addition, tentage availability includes GP large, GP medium and GP small, along with 150 Arctic's 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 handle all ordnance requirements. 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.

Helicopter/helicopter door gunnery and anti-armor gunneries are also conducted at Camp Grayling. The installation also operates a multi-purpose range complex (MPRC) for tank, TOW, door gunneries and infantry assaults with automated target scenarios. To coincide with all range assets is maneuver land for training tactics. The installation also conducts air-to-ground munitions delivery for fixed wing aircraft with drops up to 500 pounds.

Range 40 Complex includes an air-to-ground bombing range and an artillery range. A Multi-Purpose Range Complex includes MLRS/RRPR, miller drop zone, AT-4, TOW and dragon ranges, M-2 50 caliber MG Range, Jones lake base camp, tracked vehicle maneuver areas, wheeled vehicle maneuver areas and a MATES facility. 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 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 NBC gas chamber.

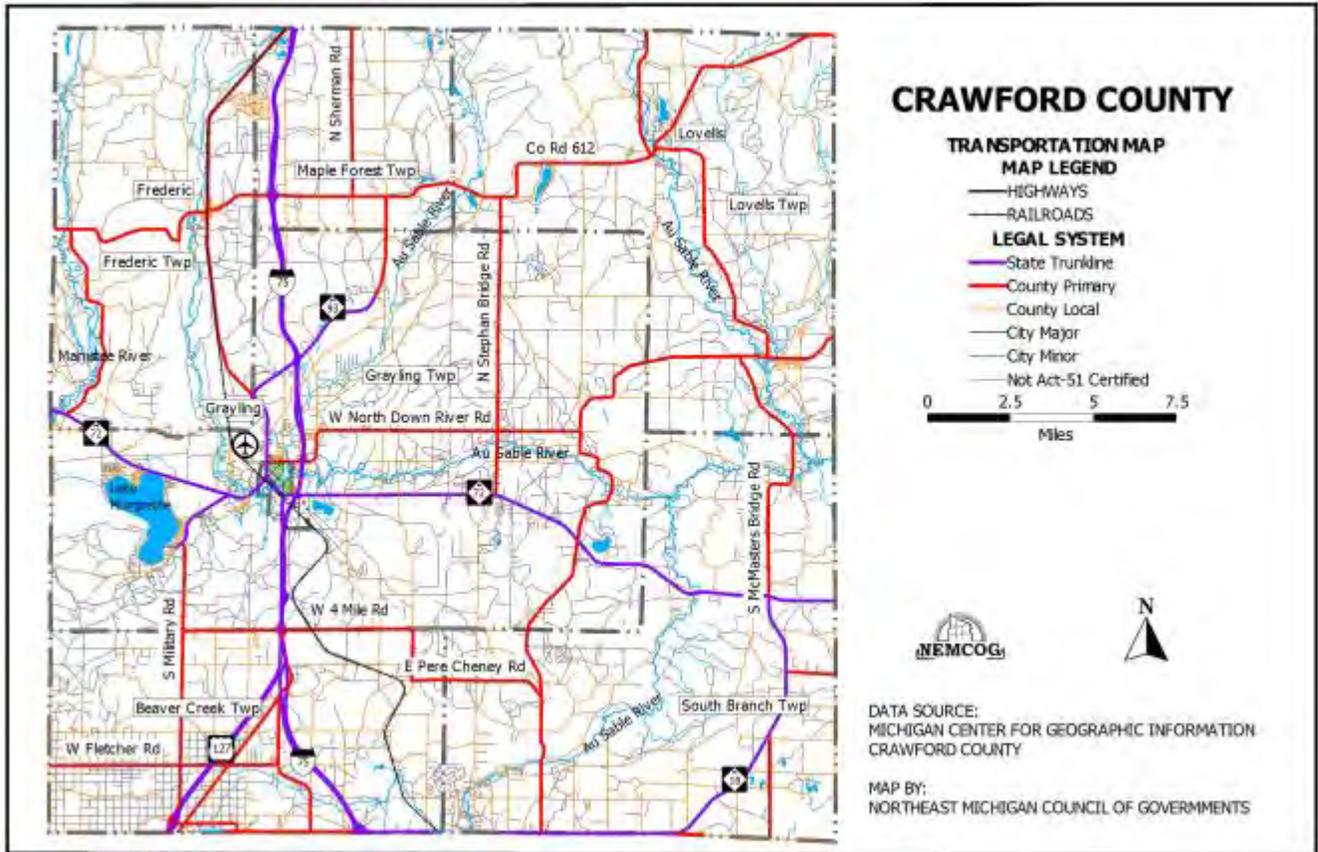
Roads and Highways

The transportation system in Crawford County is depicted in **Figure 2.7**. 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 comes 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 Village of Frederic and Lovells. Old-27 parallels I-75 through Crawford County and connects the Village of Frederic and the City of Grayling. North Other County Primary roads include North Down River Road, W. 4 Mile Road, E. Pere 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 running 17 vehicles. CCTA is located on 4276 W. North Down River, Grayling, MI 49738, Phone: (989) 348-8215. 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: | 14,226 |
| Employees: | 26 |
| FY 2010 System Data | |
| Miles: | 446,412 |
| Vehicle Hours: | 23,485 |
| Passengers: | 100,833 |
| Total Eligible Expenses: | \$1,393,965 |
| 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.

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. Address: Grayling Army Airfield, Grayling, MI 49739, Phone: (989) 344-4301.

Environment

Overview

The greatest attraction for the residents and visitors of northern Michigan is the area’s environment and rural characteristics. Recreational activities such as hunting, fishing, golfing, snowmobiling, boating and a multitude of other outdoor activities 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

The continental type of climate at Grayling is characterized by larger temperature ranges than in areas at the same latitude near the Great Lakes, which have moderated temperatures. As a result of the prevailing westerly winds, this region experiences some lake effect. However, this is minimal and is essentially limited to increased cloudiness and snowfall during the late fall and early winter. Diminished wind speeds or winds which do not traverse large, unfrozen lakes often produce clearing skies and the colder temperatures expected at continental locations.

Moderately warm temperatures dominate summers. The warmest days occur in the month of July. Between the years of 1971-2000, there was an average of 7 days per year that exceeded the 90-degree mark. 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 to mid 40's in the summer and from the low 30's to single digits in the winter (**Table 2.9**).

The following temperature extremes for this station are:

- Maximum: 104 °F (July 11, 1936)
- Minimum: -45 °F (February 3, 1898)
- Warmest monthly mean: 75.5 °F (July 1921)
- Coldest monthly mean: 4.4 °F (February 1904)

Based on the 1971-2000 period, the average date of the last freezing temperature in the spring was May 30, while the average date of the first freezing temperature in the fall was September 17. The freeze-free period, or growing season, averaged 110 days annually. In the summer, precipitation comes mainly in the form of afternoon showers and thundershowers. Most precipitation occurs in the months of April-September, which received an average of 20.76 inches or 62% of the average annual total for the 1971-2000 periods. During this same period the average wettest month was September, which averaged 4.01 inches, while the average driest month was February which averaged 1.27 inches. The average seasonal snowfall was 104.7 inches. During the 1971 –2000 period, 123 days per season averaged 1 inch or more of snow on the ground but varied greatly from season to season.

The following precipitation extremes for Crawford County are:

- Greatest one day precipitation total: 5.02 inches (August 8-9, 1965)
- Greatest monthly total: 12.51 inches (September 1986)
- Least monthly total: 0.00 inches (April 1889)

Soil moisture replenishment during the fall and winter months plays an important role in the success of agriculture for this area. While drought occurs periodically, the Palmer Drought Index indicated drought conditions reached extreme severity only 2% of the time.

| Table 2.9 Temperature and Precipitation Summary 1971-2000 | | | | | |
|--|----------------------|------|------|------------------------|------|
| Period | Temperature Averages | | | Precipitation Averages | |
| | Max | Min | Mean | Precipitation | Snow |
| January | 25.4 | 6.5 | 16.0 | 1.75 | 27.5 |
| February | 28.2 | 6.2 | 17.2 | 1.27 | 18.4 |
| March | 38.3 | 15.1 | 26.7 | 1.96 | 12.2 |
| April | 52.1 | 28.1 | 40.1 | 2.64 | 3.7 |
| May | 66.7 | 38.9 | 52.8 | 3.10 | 0.1 |
| June | 75.8 | 48.4 | 62.1 | 3.46 | 0.0 |
| July | 79.9 | 53.1 | 66.5 | 3.76 | 0.0 |
| August | 77.3 | 51.2 | 64.3 | 3.79 | 0.0 |
| September | 68.3 | 43.6 | 56.0 | 4.01 | 0.0 |
| October | 56.0 | 33.8 | 44.9 | 3.42 | 1.0 |
| November | 41.8 | 25.1 | 33.5 | 2.44 | 8.9 |
| December | 30.1 | 14.5 | 22.3 | 1.82 | 18.5 |
| Annually | 53.3 | 30.4 | 41.9 | 33.42 | 90.3 |

Source: Midwestern Regional Climate Center, Champaign IL, Station 203391 Grayling MI
Precipitation totals include rain and the liquid equivalent of frozen and freezing precipitation (e.g., snow, sleet, freezing rain, and hail).

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

Geology

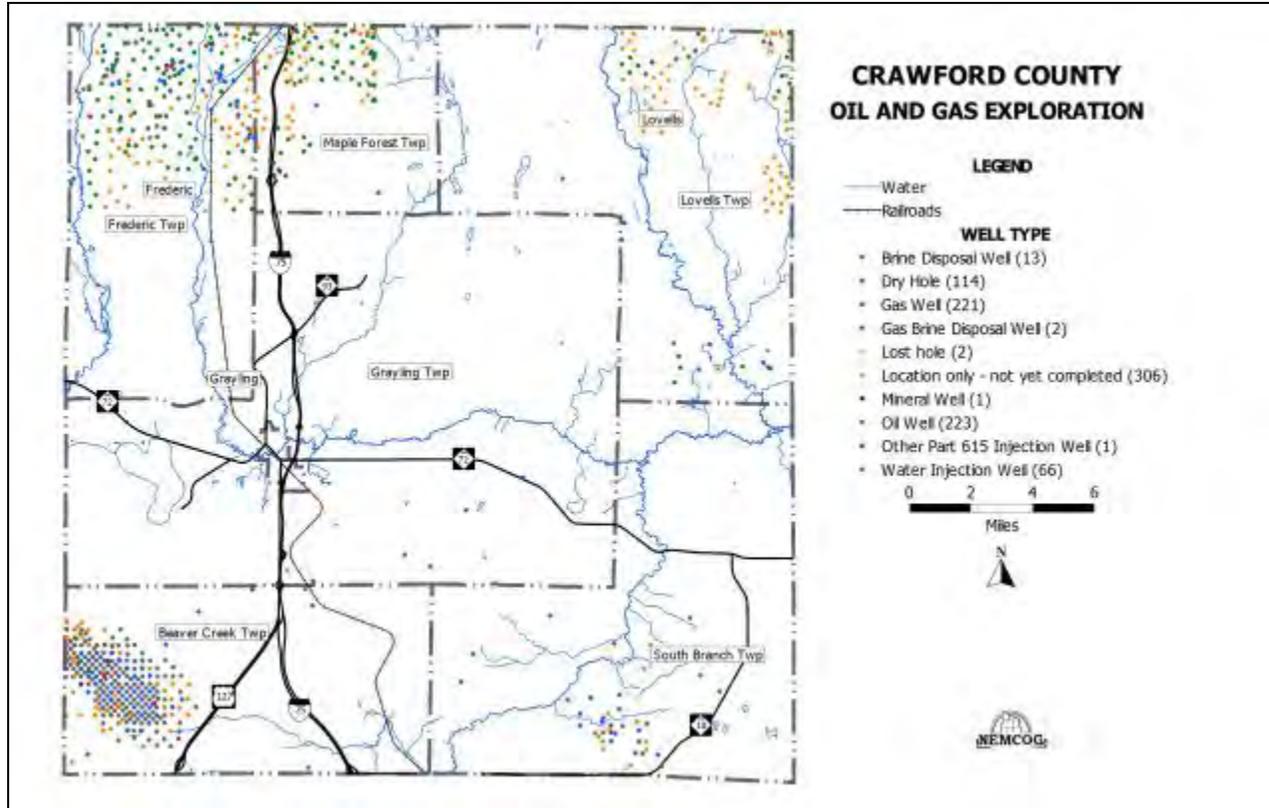
Two main bedrock formations underlie Crawford County. The northern part of the county is underlain by bedrock of the Napoleon Formation. This formation is composed of 50 to 100 feet of white and light gray sandstone of late Mississippian age. The southern part of the county is underlain by the slightly 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 2.8** is a map that shows locations of wells that are color coded to show well types and **Table 2.10** shows well 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.

| Table 2.10 Oil and Gas Exploration in Crawford County | |
|--|--------|
| Well Type | Number |
| Brine Disposal Well | 13 |
| Dry Hole | 114 |
| Gas Well | 221 |
| Gas Brine Disposal Well | 2 |
| Lost Hole | 2 |
| Location only - not yet completed | 306 |
| Mineral Well | 1 |
| Oil Well | 223 |
| Other Part 615 Injection Well | 1 |
| Water Injection Well | 66 |
| Source: Michigan DEQ 2011 | |

Soils

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.



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 maps was acquired from the Michigan Center for Geographic Information and used to analyze soils conditions and generate color thematic soil maps.

Hydric Soils and Steeply Sloped Areas

Figure 2.9 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 soils type). 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 opportunities for spectacular views of the landscape. However, steeply sloped sites have severe building constraints and are more difficult and costly to develop. 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 2.10 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.

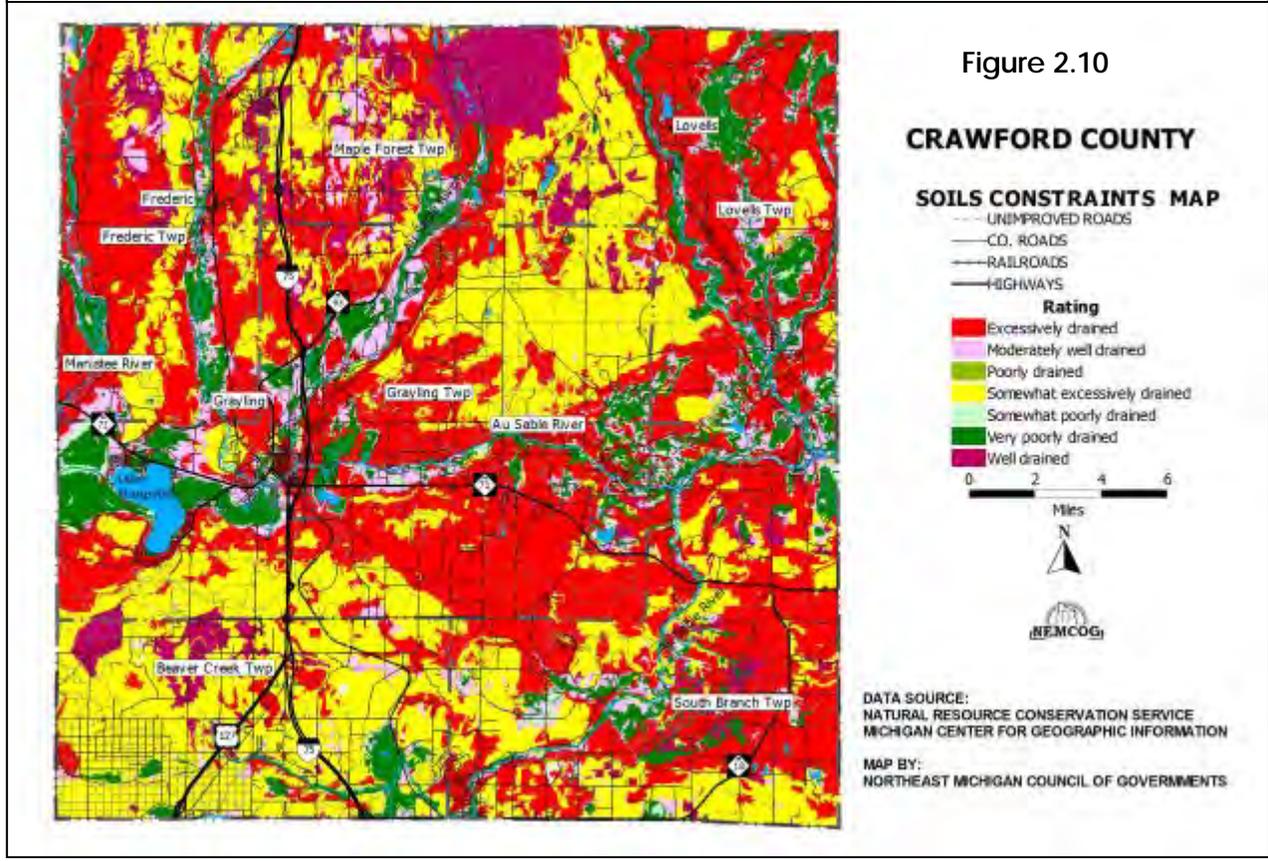
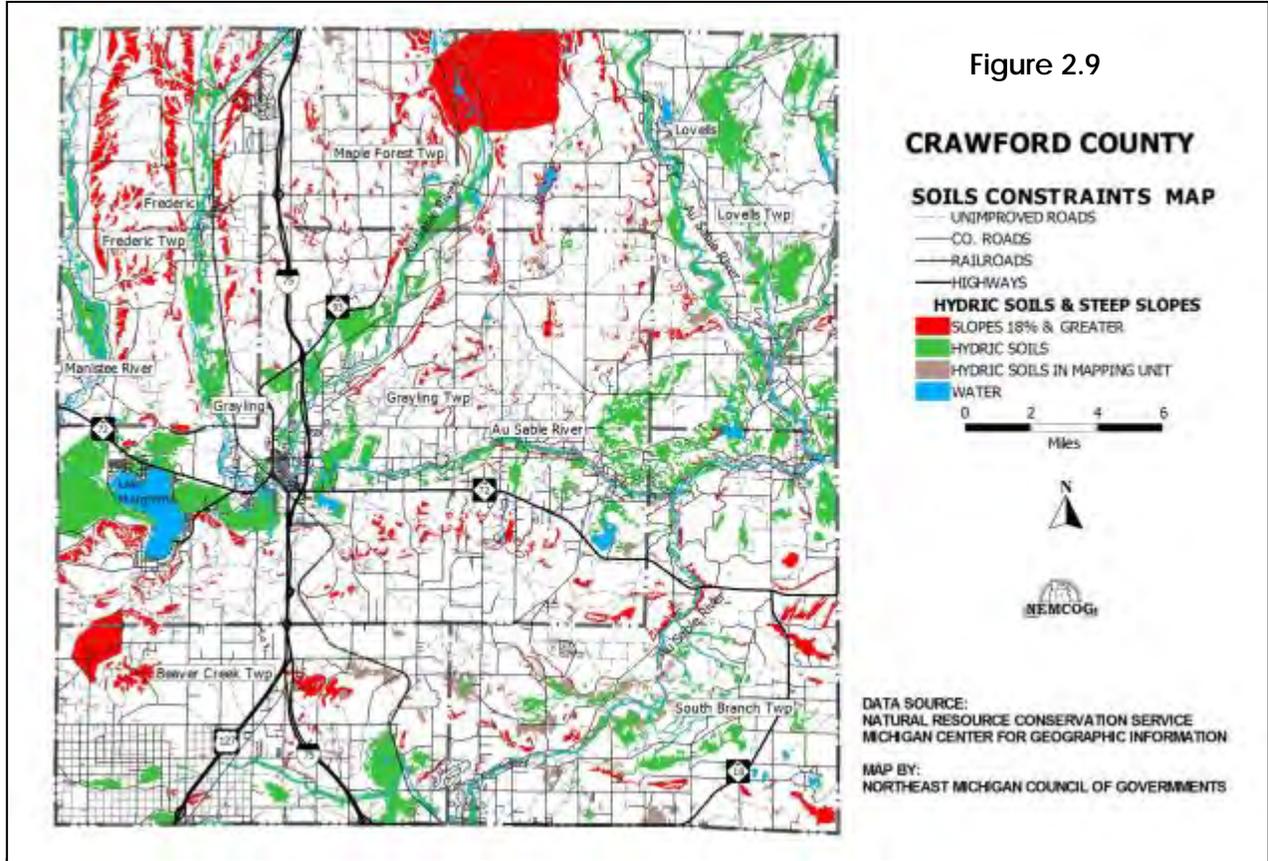
Excessively drained and somewhat excessively drained sandy soils support vegetation that can tolerate draughty conditions. Jack, red and white pine; northern pin, red and white oak; bigtooth and quaking aspen; paper birch and red maple are common. Jack pine and northern pin oak are most common on the 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

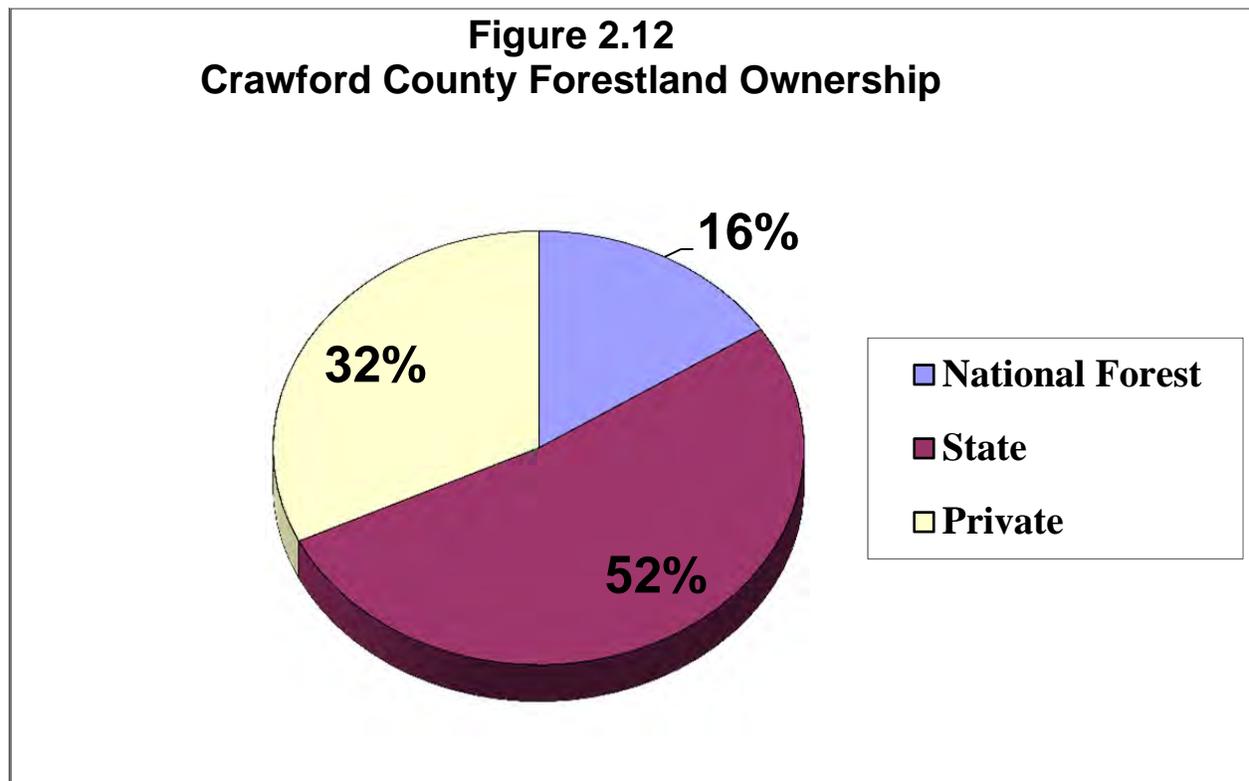
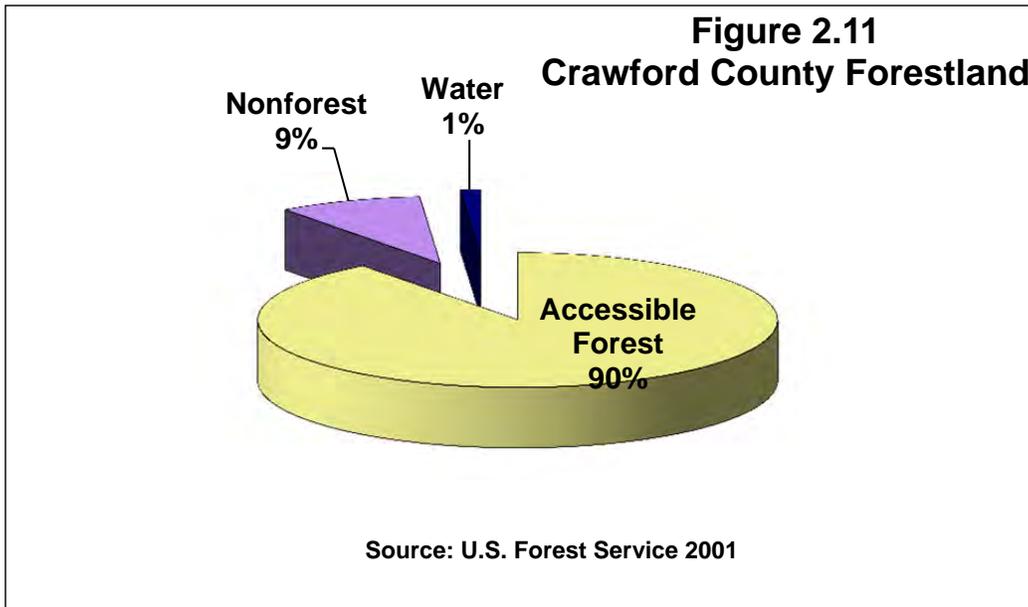
Crawford County has an abundance of lakes and streams. The county has a total of 53 lakes that are 1 acre or larger. The largest body of water in the county is Lake Margrethe in Grayling Township with a surface area of 1,928 acres, an average depth of 16 feet, and a maximum depth of 65 feet. Seven lakes are over 100 acres. The large majority of the lakes are less than 50 acres in size. The county is predominantly within the AuSable water shed. The Manistee River drains the western portion 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 2.11**. The majority of timberland in the county is in public ownership. 52% is state owned and 16% is federally owned in the form of the Au Sable State Forest and the Huron National Forest, **Figure 2.12**. 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. The next largest ownership class is in individual ownership at 32%.



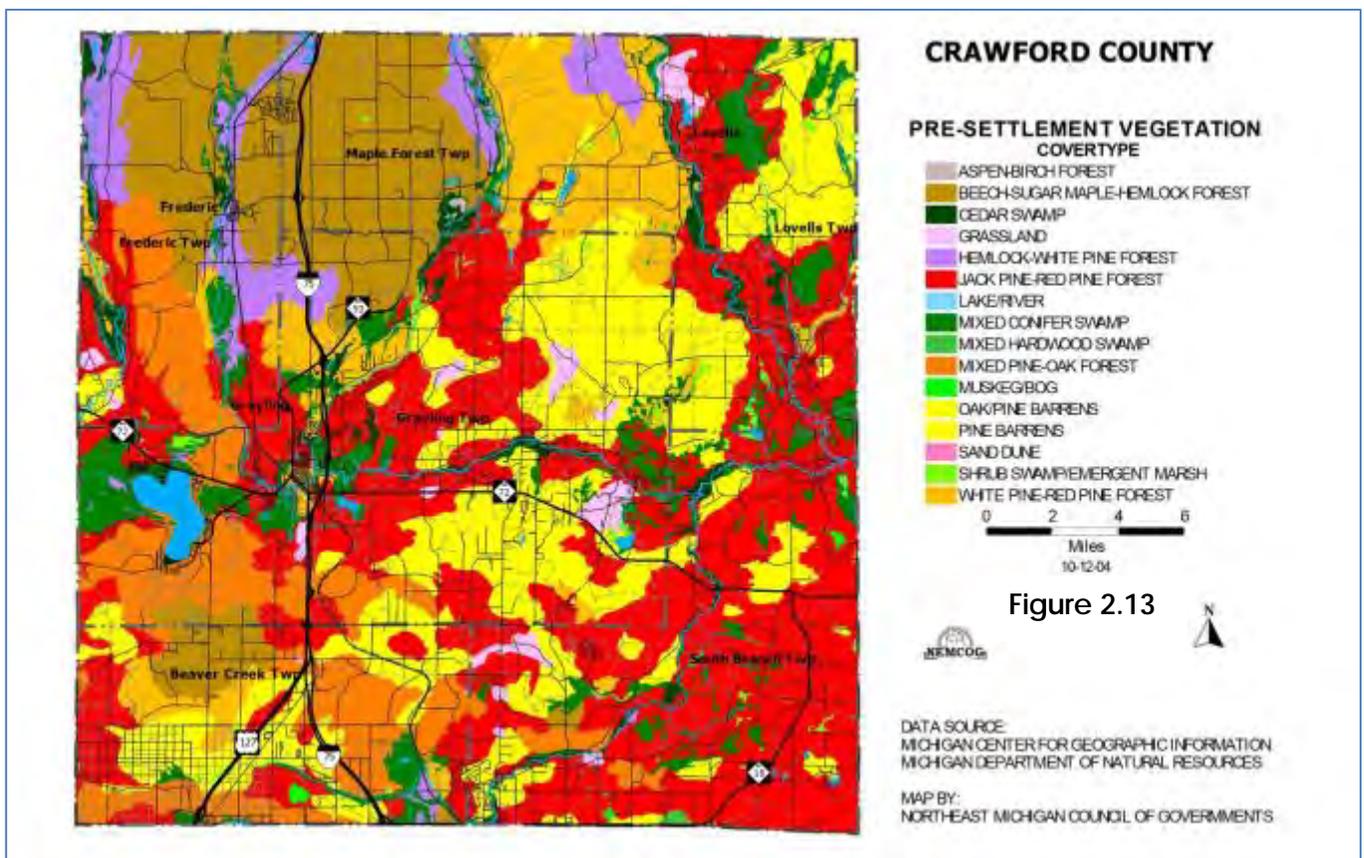
Major forest species found in the county are Jack Pine (27%), Oak/Hickory Group (23%) and Aspen (21%). The Maple/Beech/Birch Group totals 12%. A small amount of forestland is comprised of Black Spruce (6%), Balsam Fir (4%), and Red Pine (4%) Smaller acreages of Eastern White Pine, White Spruce, Northern 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.

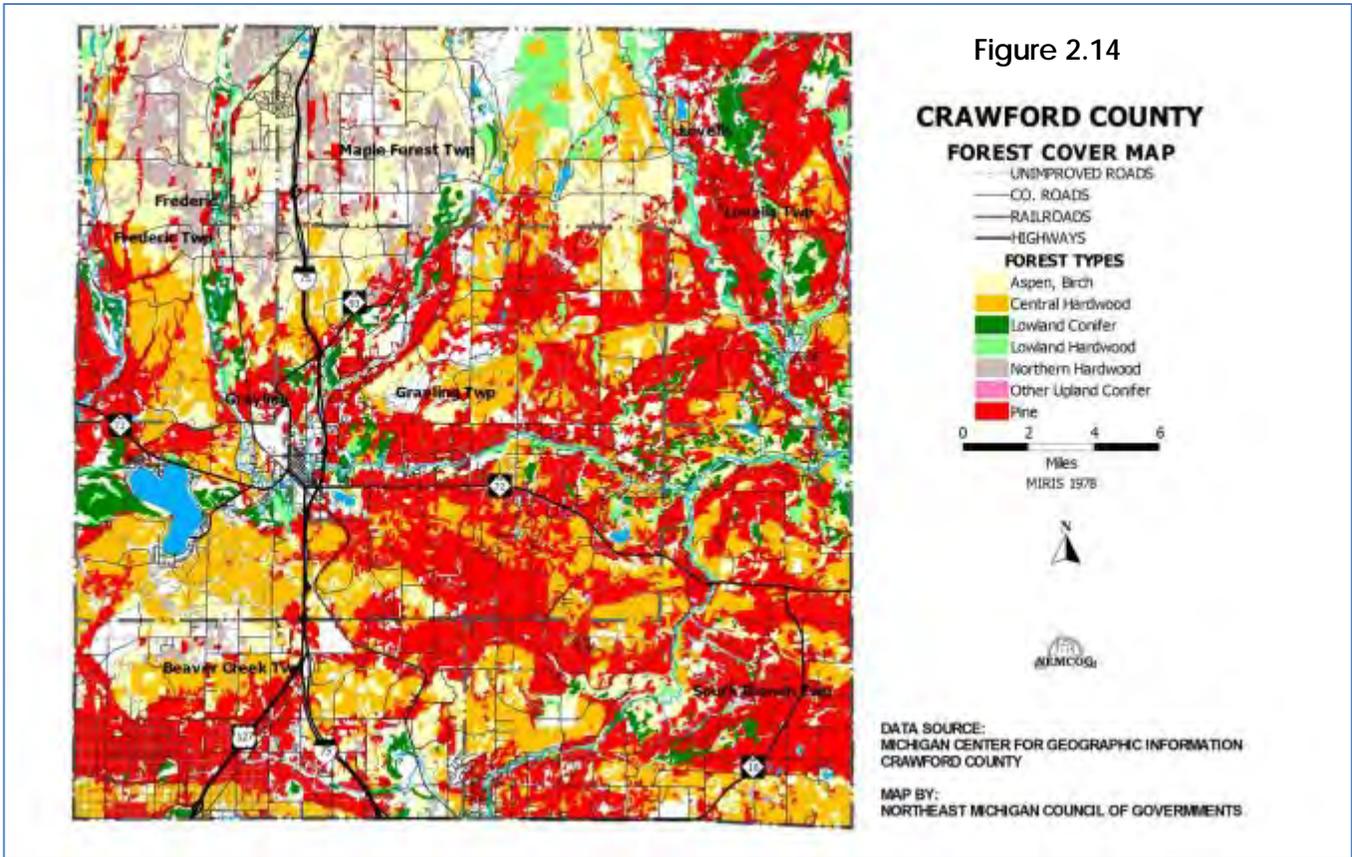


The Michigan Department of Natural Resources has compiled pre-European settlement vegetation maps of counties in Michigan. The maps were generated from information contained in the first government land survey notes in the 1800's along with information such as current vegetation, land forms and soils. 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 2.13**.

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. Logging, land clearing and wildfires have resulted in a greater presence of aspen and oak. Also, with better wildfire control and reforestation efforts, there's actually more forestland today than in the early 1800's.

Figure 2.14 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 urban-rural interface of residential development in areas dominated by Jack Pine and Red Oak indicating wildfire susceptibility.





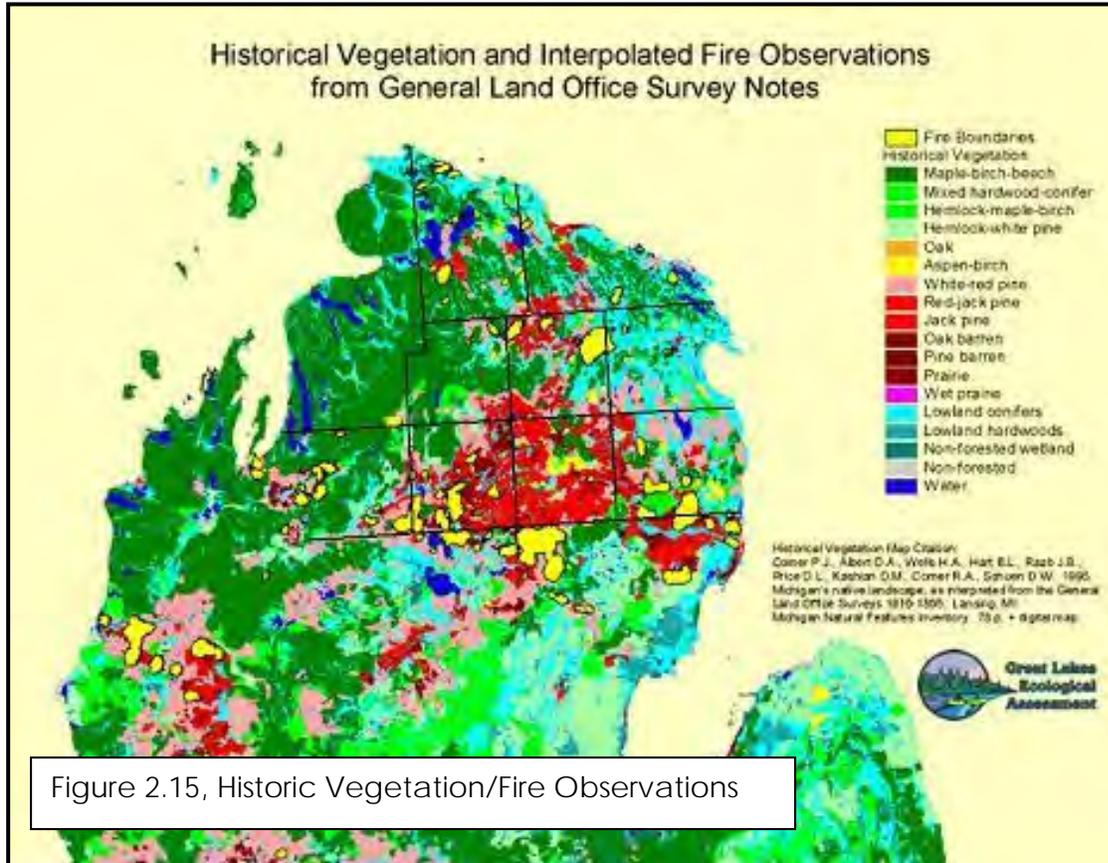
Fire Hazards

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, 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 2.15 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.



Information from the Michigan Department of Natural Resources shows there were 224 wildfires from 2001 to May of 2012 in the county that resulted in 11,819 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 2001 and 2012 there were seven wildfires greater than 50 acres in size. On April 24 of 2008, a 1,345 acre fire burned to the southern boundary of the community of Grayling. 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.

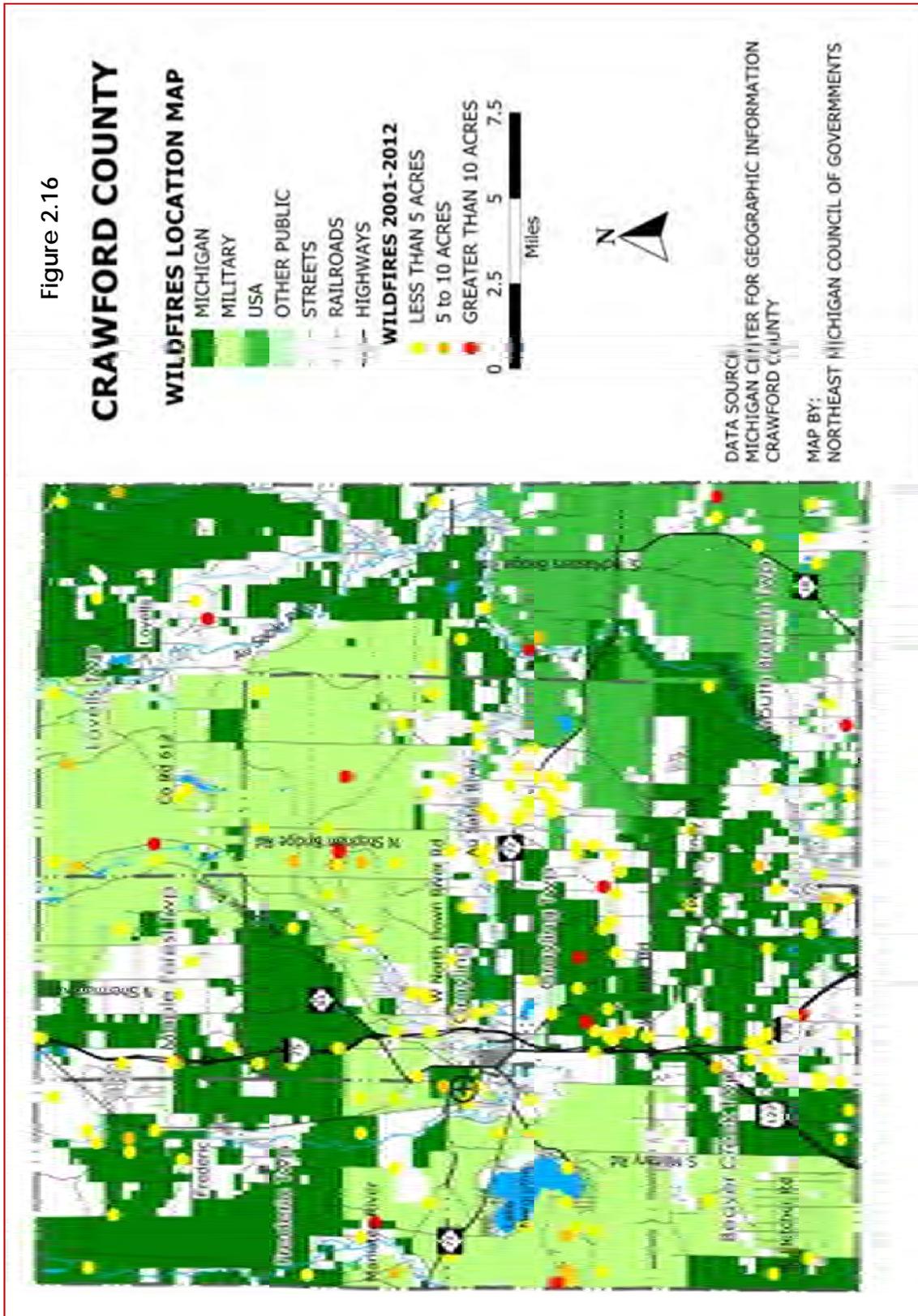
**Table 2.12
Large Fire Incidents near Grayling MI**

| Year | Name | Acres Burned | Structures Damaged or Lost |
|--------|--|-------------------|---|
| 1980 | Mack Lake Fire | over 24,790 acres | 1 Fire Fighter Killed 44 homes 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 out building |
| 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 |
| | Refuge fire | | |
| | Mech Fire | | |
| | | | |
| | Damon Fire | | |

Source: MDNR

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

Figure 2.16



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.

| County | Number of Wildfires | Acres Burned |
|---|---------------------|---------------|
| Alcona | 135 | 376 |
| Alpena | 135 | 303 |
| Cheboygan | 136 | 328 |
| Crawford | 224 | 11,819 |
| Montmorency | 110 | 416 |
| Oscoda | - | - |
| Otsego | 231 | 329 |
| Presque Isle | 74 | 424 |
| Source: Michigan Department of Natural Resources, Forest Management Division | | |

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 driest, and therefore most vulnerable, times of the year greatly increases the risk from wildfires.

Existing and Proposed Fuelbreaks

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

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

| 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 | | | | |

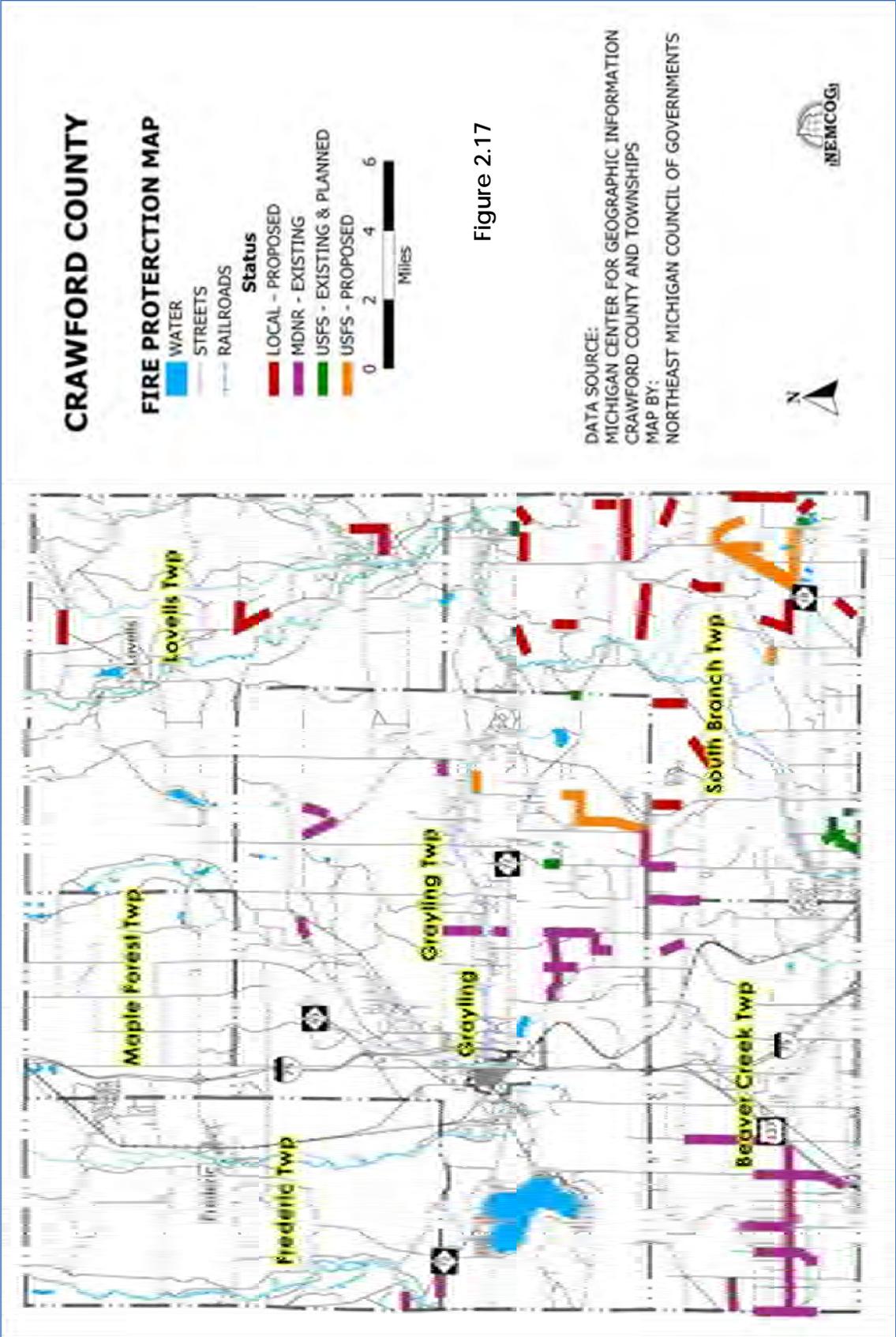


Figure 2.17

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 and achieve the goals of the community.

The purpose of this chapter is to present the status of planning and zoning in Crawford County. Furthermore, Firewise audits were conducted for each community's master plan and zoning ordinance. The Firewise Audit Questionnaire was prepared from materials developed by the nationally recognized Community Firewise Program. Summaries of the audit are presented in this chapter.

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

| Table 3.1 Crawford County Planning and Zoning Status | | |
|---|-------------------------------|--|
| Municipality | Master Plan (year adopted) | Zoning Ordinance (year of last amendment) |
| Beaver Creek Township | 2006 | 2008 |
| Frederic Township | 2009 | 2006 |
| Grayling Township | 1997* | 2011 |
| Lovells Township | 2002 | 2006 |
| Maple Forest Township | 2002 | 2011 |
| South Branch Township | 2006 | 2011 |
| City of Grayling | 2008 | 2009 |
| Crawford County | 2009 | - |
| Source: NEMCOG Planning & Zoning Review | | |

Master Plan Audits

A key element of the community master plan is the future land use plan. This is the culmination of the planning process that entails an analysis of existing conditions, public input and goal setting, and finally establishing the community's desired future. The community-wide future land use plan includes a map that depicts where the community envisions types and densities of development. As well, the plan may address important resource areas to protect. Accompanying text describes future land

use categories, compatible uses, incompatible uses and development densities. Special issue areas may include utility service areas, roads, open space development and waterfront development. The future land use plan is a policy document designed to guide land use decisions over a given planning horizon, usually 20 years. By comparison, the zoning ordinance and zoning map is a local law that regulates how property can be developed today.

The following questions were researched for each community in Crawford County:

- Does the Master Plan have a Natural Resource section?*
- Are wildfires, high risk areas or Firewise addressed in Goals and Objectives?*
- Are wildfires, high risk areas or Firewise addressed in Future Land Use Plan?*
- Are wildfires, high risk areas or Firewise addressed in Implementation Section?*
- Does the master plan have a zoning 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 |
| <i>Identifies high risk wildfire areas</i> | X | | X | | | | | X |
| <i>Identifies steep slopes & hydric soils</i> | X | X* | X | | | X | X | X |
| <i>Identifies draughty soils</i> | X | X* | X | X | | X | | X |
| <i>Identifies rivers & lakes</i> | X | X | X | X | | X | X | X |
| <i>Identifies oil & gas wells</i> | | | | X | | | X* | |
| <i>Wildfires addressed in Goals & Objectives</i> | X | | | | | | | X |
| <i>Wildfires addressed in Future Land Use</i> | | | X | | | | | X |
| <i>Wildfires addressed in Implementation section</i> | | | X | | | | | |
| <i>Wildfires addressed in Zoning Plan</i> | | | | | | | | |
| <i>*Indicates only limited or insufficient discussion in plan to be of value to this Wildfire Protection Plan.</i> | | | | | | | | |
| <i>**Master Plan was not available.</i> | | | | | | | | |

Table Summary

Forest types, one of the major risk factors for wildfires, were only identified in the plans of Crawford County and the Townships of Grayling, Frederic, Maple Forest, and South Branch. Only Crawford County, Grayling Township, and South Branch Township identified high risk wildfire areas. Most of the plans identified soils types and lakes/streams while only one plan (Frederic Township) identified oil and gas wells. In terms of planning for wildfire protection, only two plans (Crawford County and South Branch Township) included goals and objectives relating to wildfires. In fact, some communities focused more on the preservation of natural resources rather than natural resource management.

Ordinance Audits

Each community in Crawford County was audited for information contained in their Zoning Ordinance and other local ordinances pertaining to wildfire protection.

The following questions were researched for each community in Crawford County:

- *Are wildfires & Firewise addressed in Zoning Ordinance?*
- *Does the zoning ordinance have vegetative fuel clearance provisions that require distance between heavy vegetation types and the proposed or existing structures?*
- *Does the township have standards for private/public road construction?*
 - *Access for emergency responders, ingress, egress, and evacuation shall be provided for all buildings.*
 - *Roads designed and constructed to allow evacuation simultaneously with emergency response operations.*
 - *Roads not less than 20 feet of unobstructed width with a 13 and 1/2-foot vertical clearance.*
 - *Parking allowed only where an additional 9 feet of improved road width is provided and only within that improved road width.*
 - *Roads designed, constructed, and maintained to accommodate the load and turning radius of the largest apparatus typically used to respond to that location.*
 - *Roads have no grade in excess of 10 percent, unless mitigation measures can be agreed upon jointly by the fire department and the developer.*
 - *Dead-end roads in excess of 300 feet in length are provided with turnouts and turnarounds.*
 - *Every dead-end fire service access road more than 300 feet in length are provided with a turnaround at the terminus having a minimum radius of 50 feet to the center line, or alternatively shall have a "hammerhead T" turnaround to provide emergency vehicles with a three-point turnaround ability.*
- *Does the township have driveway standards?*
 - *Where any point of a building is greater than 150 feet from a road, provide a driveway to within 150 feet of the building.*
 - *Where the driveway is greater than 150 feet in length, is not less than 12 feet in unobstructed width with 13 and 1/2 feet in vertical clearance.*
 - *Where the driveway is greater than 300 feet, provide turnouts or turnarounds at locations approved by local fire authorities.*
 - *Required driveways have a grade not to exceed 10 percent, unless mitigation measures can be agreed on jointly by the fire department and developer or owner.*

- Does the township require developments (such as subdivisions, condominium, commercial, recreational and industrial) have two egress ingress roads?
- Does the township require developments have underground utilities
- Does the township require developments have signage for street identification?
- Is there an ordinance that requires house addresses to be displayed on 911 signs at the driveway end.
- Vegetative maintenance for managing dangerous fuel loads in high fire risk areas.

| 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. |
| Are wildfires & Firewise addressed in Zoning Ordinance? | n/a | | | | | | | |
| Vegetative fuel clearance provisions that require distance between heavy vegetation types | | | | | | | | |
| Standards for private/public road construction? | X | | | | | X | X | X |
| Driveway standards? | | X | X | | | X | X | X |
| Does the township require developments (such as subdivisions, condominium, commercial, recreational and industrial) have two egress ingress roads? | | | | | | | | |
| Does the township require developments have underground utilities | X* | | | | | | X* | X |
| Does the township require developments have signage for street identification? | | | | | | X | X* | X |
| Is there an ordinance that requires house addresses to be displayed on 911 signs at the driveway end. | X | | | | | | | |
| Vegetative maintenance for managing dangerous fuel loads in high fire risk areas. | | | | | | | | |
| *Means only in specific circumstances | | | | | | | | |

Table Summary

None of the local ordinances addressed Firewise techniques in their local ordinances nor did they provide for vegetative fuel clearance or for managing dangerous fuel load. Some Townships have adopted private road and driveway regulations; however none had sufficient subdivision regulations. Underground utility requirements were also rare and usually only included for Planned Unit Developments. Street signage requirements were also rarely found.

Local Government Summary

Crawford County

The Crawford County Master Plan included most of the relevant background information that is necessary, however planning for wildfire protection is contained within one goal: The County Local Emergency Planning Committee will lead the implementation of the Hazard Mitigation Plan. Given the number one hazard is wildfire, communities are encouraged to adopt and promote a community-wide “Firewise” program.

While no county zoning exists, Crawford County does have a Uniform House Numbering Ordinance No. 86-1:

1. *§3.1: Display of House Number - Each primary structure shall display a house number. A house number shall not be displayed containing numbers less than 4 (four) inches in height. It shall be visible from the roadway named in the address, and all house numbers shall be in Arabic numerals.*
2. *§3.2: The Building and Zoning Department of Crawford County is hereby empowered to promulgate rules for house number display. Said rules shall be effective upon approval of the Crawford County Board of Commissioners.*

The Crawford County Road Commission utilizes standards for public and private road construction which come under the jurisdiction of Crawford County. These standards include a 66-foot right-of-way, 11-foot land width (paved), and four-foot shoulders. In addition, the Road Commission requires each project to conform to the requirements of the Michigan Manual of Uniform Traffic Control Devices thereby requiring street signage.

The City of Grayling

Identification of forest types and any discussion of wildfires is absent in the Grayling Master Plan. However, the plan does identify soil types, but it lists them by soil name rather than descriptive information.

The Zoning Districts which contain land area within a higher risk wildfire area are:

- Agricultural – Open Space
- Industrial
- Government
- R-1A and B
- R-2
- R-3

- CBD
- C-1, C-2, C-3

A large area of the Agricultural and Open Space District in the southern portion of the City is in the extremely high risk wildfire zone. While no road standards appear to exist, the City of Grayling Zoning Ordinance does contain minimal standards for driveways as follows:

1. *§9.3.5 (Off Street Parking) states that residential driveways in R-1A or R-1B shall be 10' wide.*
2. *§9.5.1 contains a general statement about grading driveways to dispose of surface water.*
3. *In addition, §7.4.3 (PUD) requires Planning Unit Developments to have underground utilities.*

Grayling Township

The Grayling Township Master Plan contains all relevant background information necessary in wildfire planning. Absent from the Goals & Objectives, wildfire planning does, however, occur in the Future Land Use chapter as follows: Protection of public health and safety by avoiding construction or altering construction in areas which present natural hazards. In the Grayling area, the primary natural risk is from forest fire and home built among Jack Pine should have adequate access for emergency response vehicles.

Policy of Grayling Township:

1. Permit only very low density residential development in High Fire Risk Areas on large wide lots (10 acre minimum)
2. Encourage state land managers to only permit passive recreation and hunting rather than activities that could promote fires in these areas.
3. Promote only those road improvements that can help ensure safe emergency access to remote properties.
4. Clear Jack Pine and large canopy trees away from residences in fire-prone areas.

Grayling Township goes one step further by also including mention of wildfire risk in the Implementation section of the plan by referencing the relationship of wildfires to zoning. The plan briefly mentions that residential development east of Grayling is generally too high in light of the fire prone areas, poor roads, and limited fire services.

The Zoning Districts which contain land area within a higher risk wildfire area are:

- Deferred Development
- General Commercial
- General Residential
- Heavy Commercial
- I-75
- Industrial
- Natural River
- Planned Industrial

- Recreational Forest
- Single Family Residential

Nearly all of Grayling Township contains high risk wildfire zones. Only a portion of the Township in the northeast corner is considered low risk.

Some driveway standards do exist within the Zoning Ordinance as follows:

1. *§4.03 Access Management – properties fronting on M-72, M-93, or I-75.*
2. *All driveways in §4.03 shall have 12’ width and 15’ height clearance.*
3. *Also, all driveways in §4.03 shall provide turnouts or turnarounds for emergency vehicles.*

In addition, the Zoning Ordinance “encourages” underground utilities but does not require them.

Frederic Township

The Frederic Township Master Plan contains all background information needed with the notable exception of the identification of wildfire risk areas. Wildfires are not mentioned in the Goals & Objectives or Future Land Use.

The Zoning Districts which contain land area within a higher risk wildfire area are:

- General Residential (portions)
- Recreational Forest
- Deferred Development
- Au Sable River
- Manistee River

The southern portion of Frederic Township contains extremely high risk wildfire areas. A large portion of the Deferred Development District exists within this high risk zone. The northern portion of the Township is largely considered lower risk.

The Frederic Township Zoning Ordinance states that public roads shall conform to Crawford County Road Commission Standards. Other regulations pertaining to wildfire protection and emergency access are absent from Frederic Township ordinances.

Lovells Township

While the Lovell’s Township Master Plan was not available for review, the Zoning Districts which contain land area within a higher risk wildfire area are:

- Residential
- Recreational Residential
- Greenbelt
- Industrial
- Commercial

Lovells Township contains large areas of high to moderate risk wildfire zones. Much of this land is zoned residential as well as recreational residential. No standards pertaining to wildfire protection and emergency vehicle access were found in the Lovells Township ordinances.

Maple Forest Township

While the Maple Forest Township Master Plan does contain relevant background information, it does not identify high risk wildfire areas. However, there are only limited wildfire areas in the Township. Wildfires are not addressed in the planning chapters.

The Zoning Districts which contain land area within a higher risk wildfire area are:

- Resource Conservation
- Farm & Forest
- Commercial Business
- Low Density Residential
- Mixed Residential

The majority of Maple Forest Township is in the low risk wildfire zone. Intermittent moderate risk areas exist throughout the Township, however. Higher risk areas are found in the extreme northeast and southeast corners of the Township.

The Maple Forest Township Zoning Ordinance does contain some standards for driveways and private roads as follows:

1. *§3.24 Driveways & Private Roads:*
2. *Private roads provide access to 5 or more parcels.*
3. *Driveways provide access to not more than 4 parcels*
4. *§6.03E.k – Public streets shall be developed in accordance with county road commission standards.*
5. *Private roads shall have 22' gravel or paved surface + 5' shoulders on each side = 32' width. No vertical clearance requirements.*
6. *While no specific grade requirements are in place, the ordinances states that Zoning Administrator shall send the private road plans to the Township Engineer if the grade exceeds 5%.*
7. *§8.01 U: Only PUDs are required to have emergency vehicle turn around areas.*
8. *Driveways are required to provide a 15' horizontal and 12' vertical clearance area.*
9. *The Zoning Ordinance requires private roads be posted with a clearly readable street sign.*

NOTE: In 2006, a zoning ordinance was adopted which contained private road standards including easement width, maximum grade, turn around configuration, location from intersection, and intersection angles. In 2009, an amendment was adopted which deleted most of these standards leaving only the width standard in place.

Beaver Creek Township

The Beaver Creek Township Master Plan identifies steep slopes and hydric soils only. The plan also notes that a large oil field is located in the western portion of the Township. Not only does the Township not address wildfire risk, many of the goals/objectives encourage development throughout the Township. One goal notes the opportunity for the Township to take control of federal/state lands with the potential for developing them.

Objective E (Policy E1) does suggest the establishment of ordinances to protect sensitive natural resources and minimize the placement of buildings on soils not

conductive to development. However, the soils the goal is referring to are likely steep and hydric soils, as indicated in the natural resources chapter.

The Zoning Districts which contain land area within a higher risk wildfire area are:

- Resource Development
- Low Density Residential
- Community Services
- Highway Services Commercial
- Industrial
- Medium Density Residential

The majority of Beaver Creek Township is in the high and moderate risk wildfire zones. Much of this land is zoned resource development and low density residential. Some low risk area is located in the northern portion of the Township.

Limited public/private road standards are found in the Beaver Creek Township Zoning Ordinance as follows:

1. *§11.09 Mobile Home Parks: Each mobile home lot shall have a 25' side access road or drive kept free of trees. Roadways within a mobile home park shall be 30' wide. 16' wide open way shall be maintained for emergency vehicles.*
2. *§12.07 Supplementary Standards for PUD: Refers to Crawford County Road Commission standards.*
3. *§ 16.06 Frontage Roads & Service Drives: 30' minimum width*
4. *Roads shall have not less than 20 feet of unobstructed width with a 13 and 1/2-foot vertical clearance.*
5. *§4.07 Resource Development District & Agricultural Residential District: roads shall have at least 12' horizontal and 13 1/2' vertical clearance.*
6. *§14.38 Access to Residential Structures in Forested Areas: 15' horizontal and 12' vertical clearance of objects and vegetation.*
7. *§16.06 Frontage Roads & Service Drives: required street signage.*
8. *§12.07: Requires Planned Unit Development to have underground utilities.*

South Branch Township

The South Branch Township Master Plan addresses all relevant natural resource information (with the exception of oil and gas wells). Wildfires are addressed in the planning chapters as follows:

“Establish a community “Firewise” education program to protect existing and new development from wildfire. Timber management and regeneration of mature stands are key to reducing fuel build up and threats of wildfires. Timber management at urban-wildlands interface should be encouraged.

The Zoning Districts which contain land area within a higher risk wildfire area are:

- Resource Conservation
- Farm & Forest
- Low Density Residential
- Mixed Residential
- Commercial Business
- Stream Corridor

All of South Branch Township exists within the moderate to high wildfire risk areas. These areas are largely zoned Resource Conservation, Low Density Residential, and Mixed Residential.

The South Branch Township Zoning Ordinance does contain standards for private roads and driveways as follows:

§3.23 Driveways & Private Roads

Private Roads:

1. *Requires access for emergency responders' ingress and egress.*
2. *Minimum ROW of 66' (or current County Road Commission ROW width, whichever is greater). Compacted gravel or paved width of 22' with 5' shoulders on each side = total 32'.*
3. *Maximum grade 7%. Maximum 5% grade within 100' of an intersection.*
4. *Zoning Ordinance contains a general statement about providing a turnaround area.*

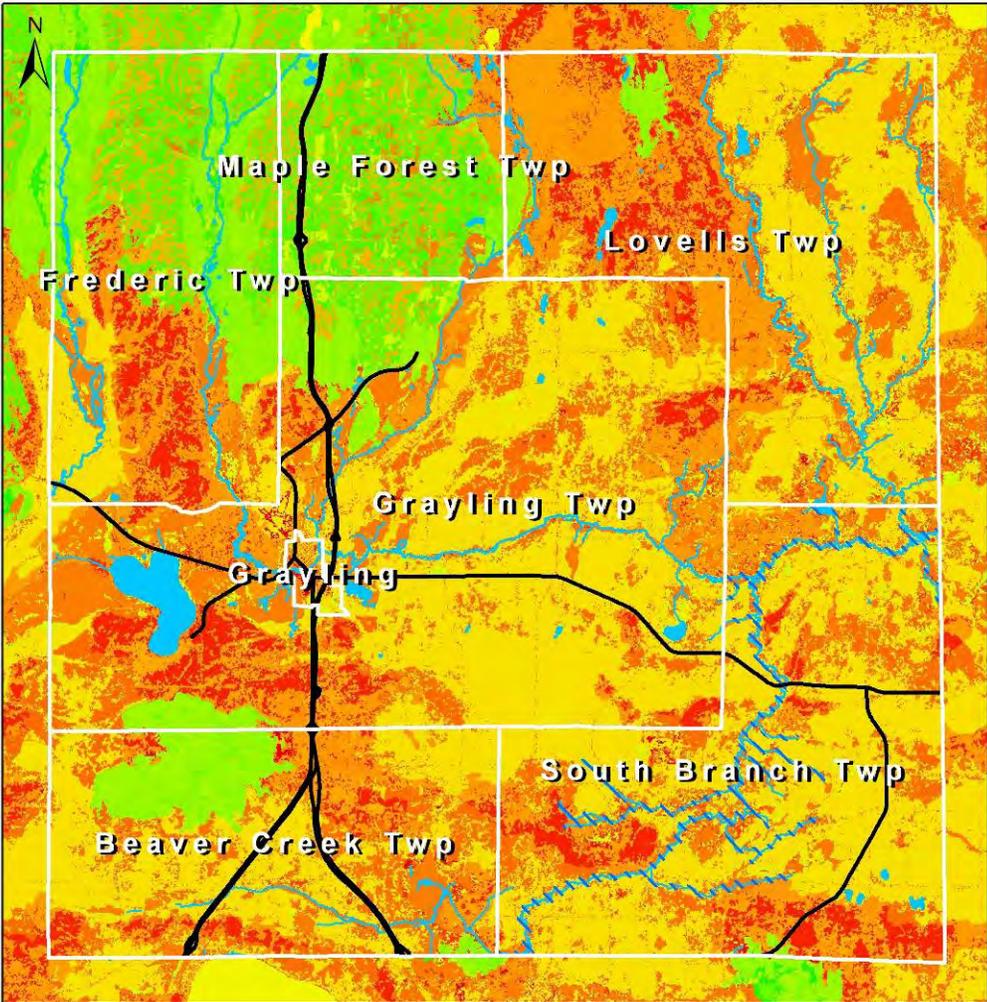
Driveways:

1. *15' horizontal and 14' vertical clearance – all driveways*
2. *Turn around area provided within 100' of structure capable of handling 40' vehicles (minimum T-type turn around 20' X 45') for emergency vehicles.*
3. *PUD section requires turn around area..*
4. *Ordinance contains requirements for street signs.*

Wildfire Hazard Level
Higher Risk
Lower Risk

Lakes
Rivers
Highways

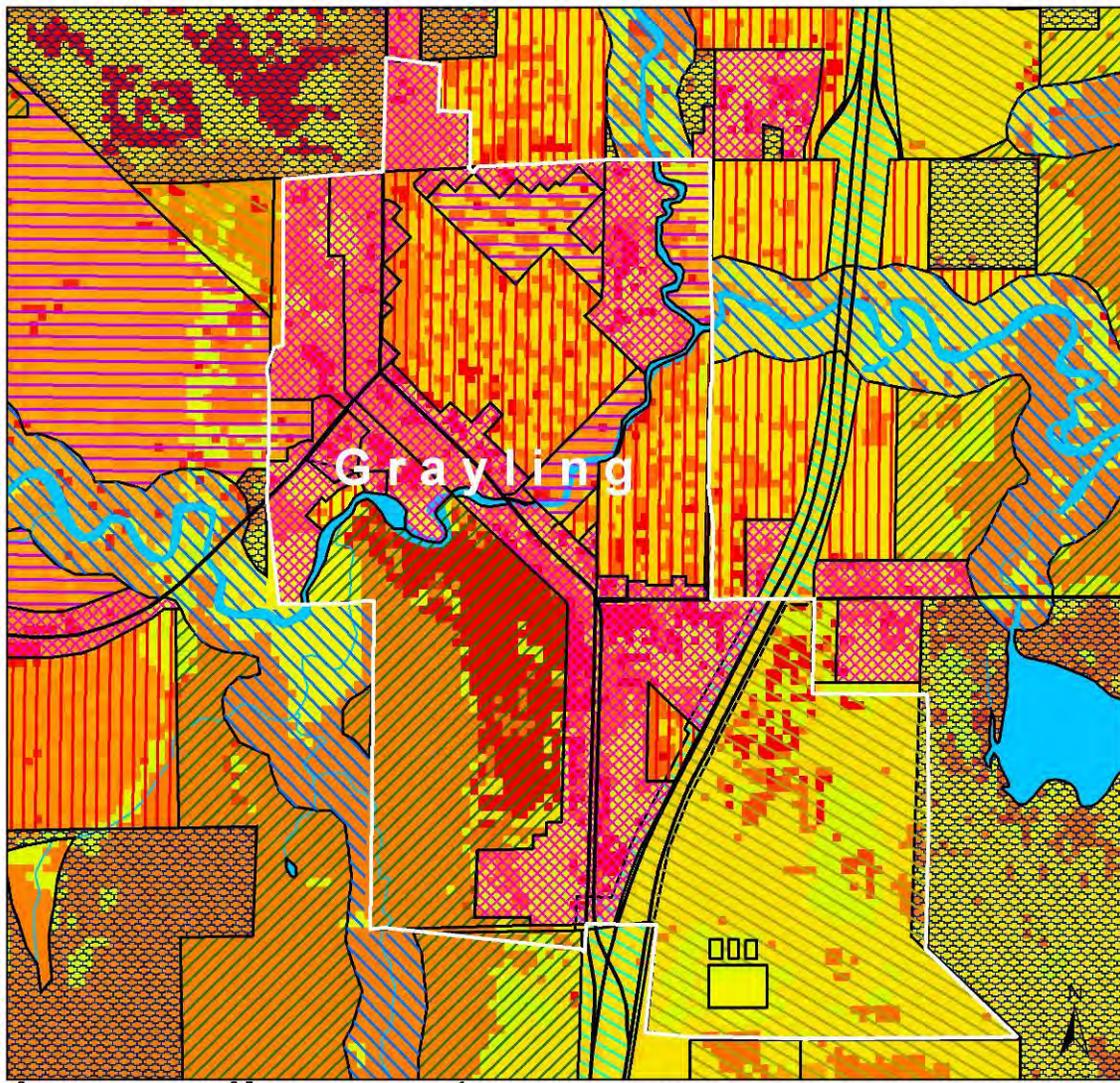
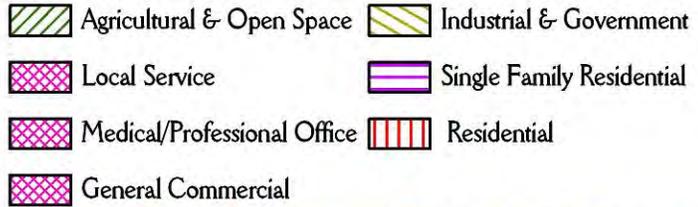
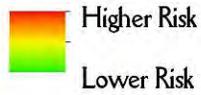
Crawford County Wildfire Risk Areas



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

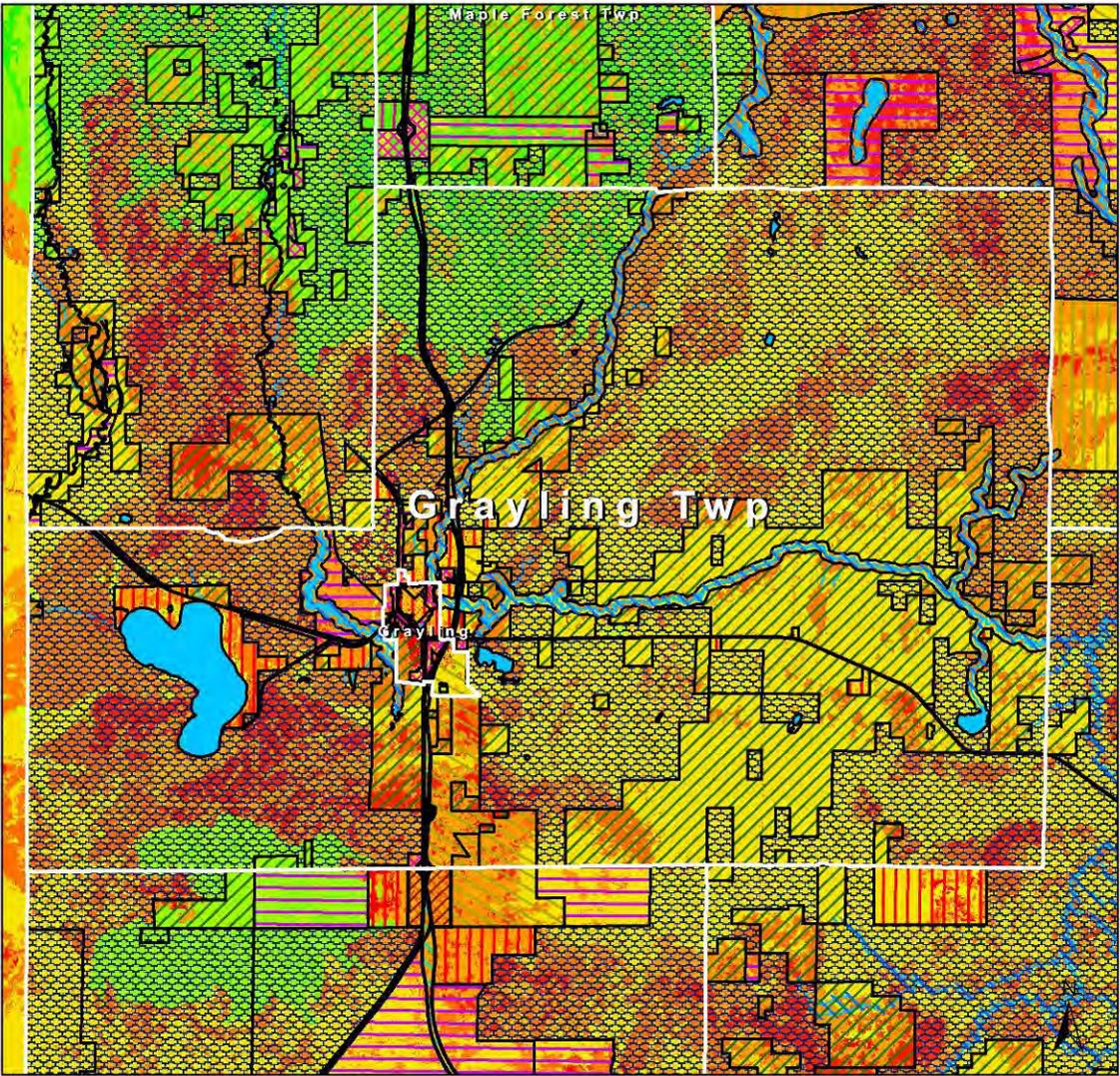
City of Grayling Wildfire Risk Areas & Zoning Districts

Wildfire Hazard Level



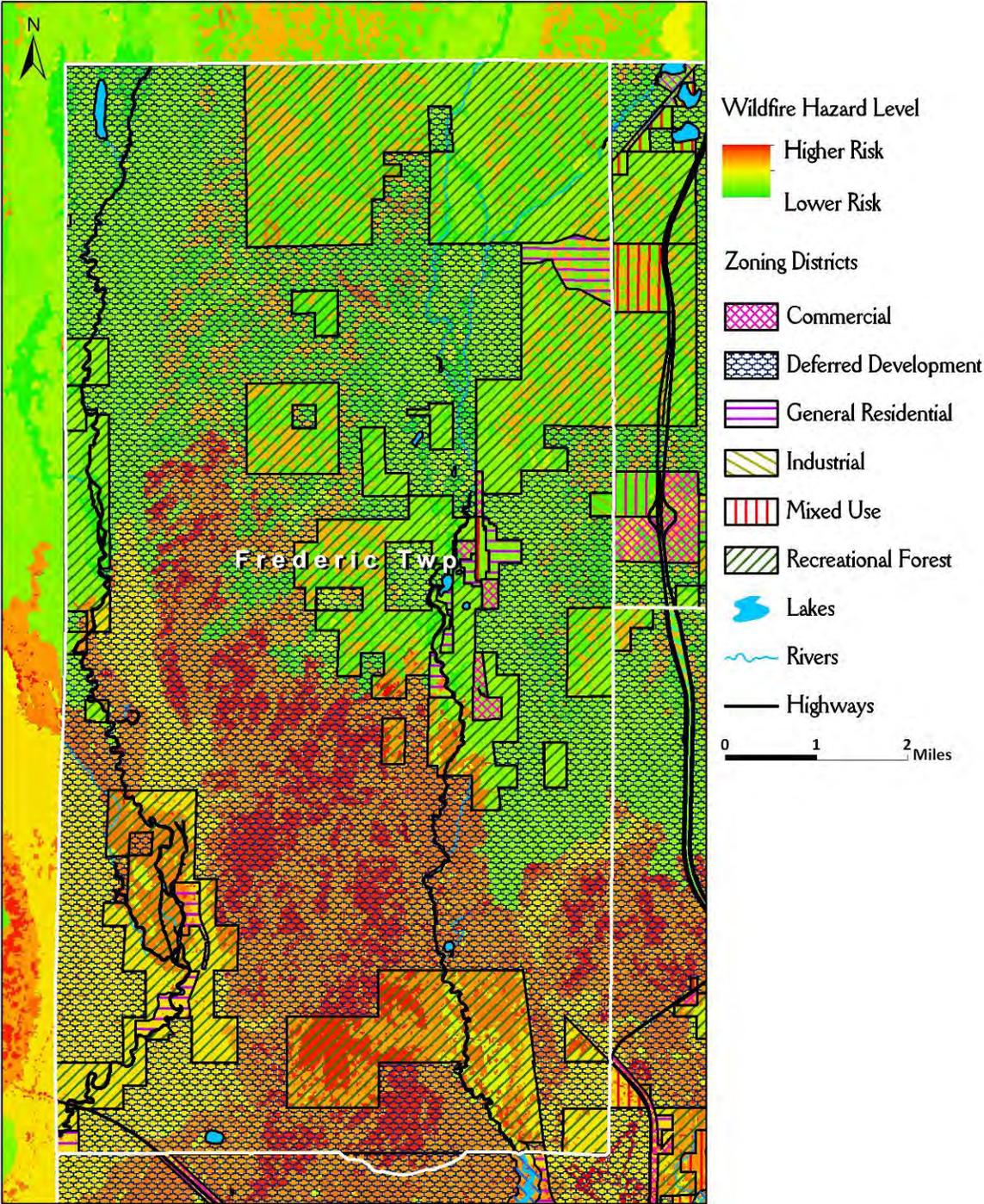
Map prepared by the Northeast Michigan Council of Governments
Data Source: US Forest Service

Grayling Township Wildfire Risk Areas & Zoning Districts



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

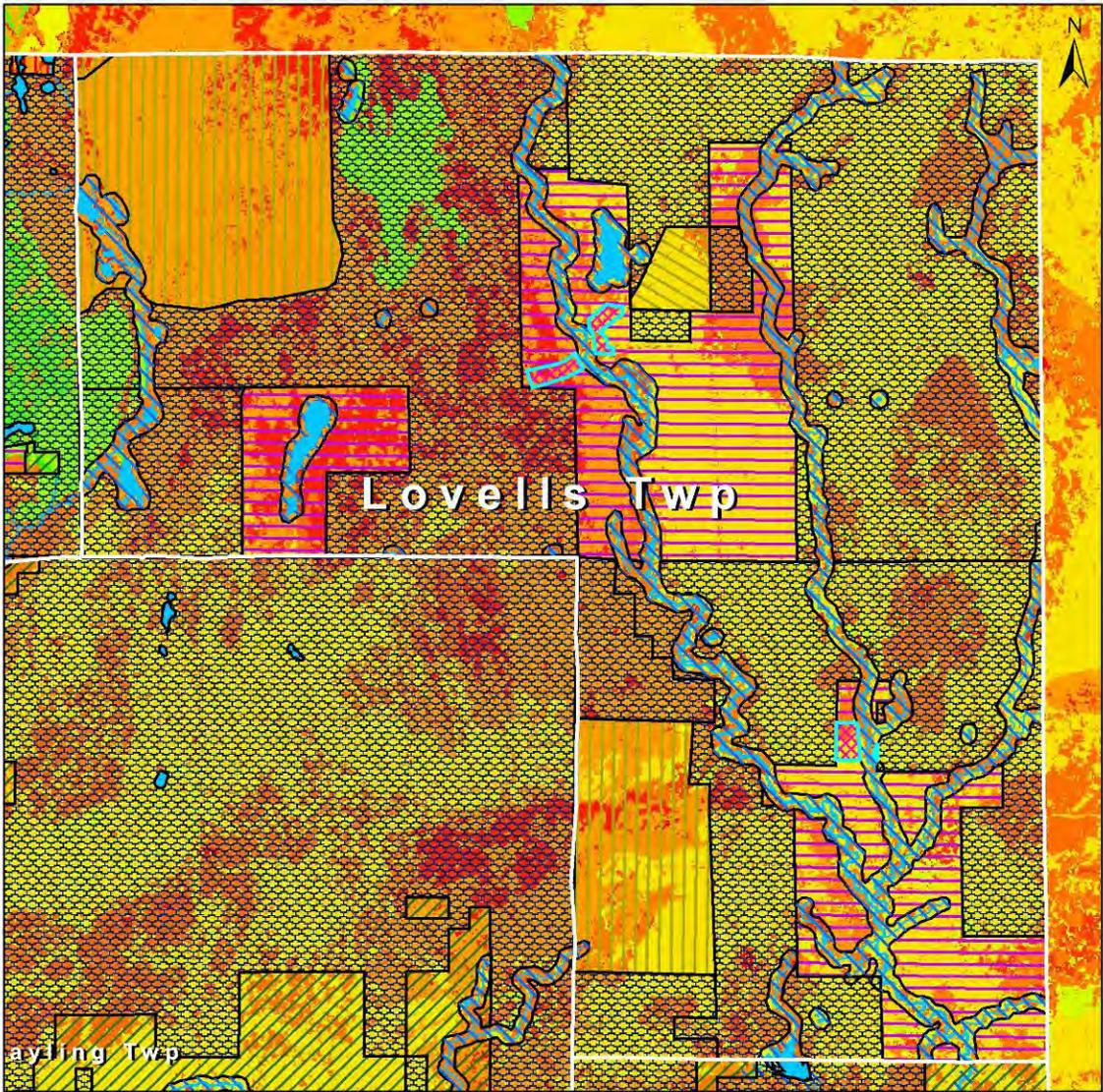
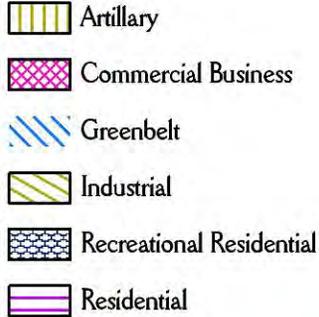
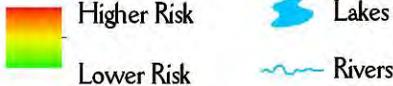
Frederic Township Wildfire Risk Areas & Zoning Districts



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

Lovells Township Wildfire Risk Areas & Zoning Districts

Wildfire Hazard Level



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

Maple Forest Township Wildfire Risk Areas & Zoning Districts

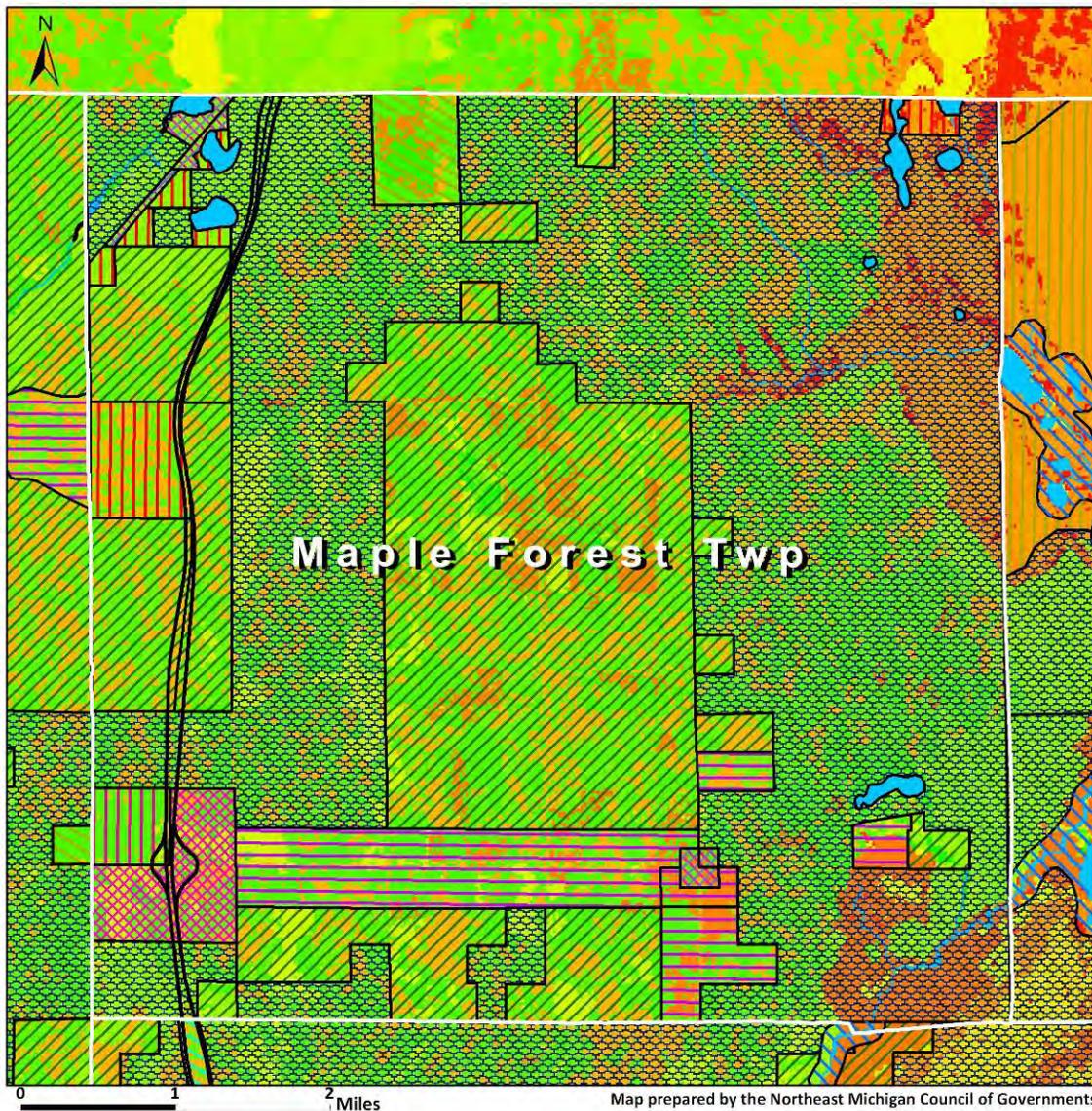
- | | |
|---|--|
|  Commercial & Business |  Low Density Residential |
|  Farm & Forest |  Medium Density Residential |
|  Light Industrial |  Neighborhood Business |
|  Industrial |  Resource Conservation |

Wildfire Hazard Level

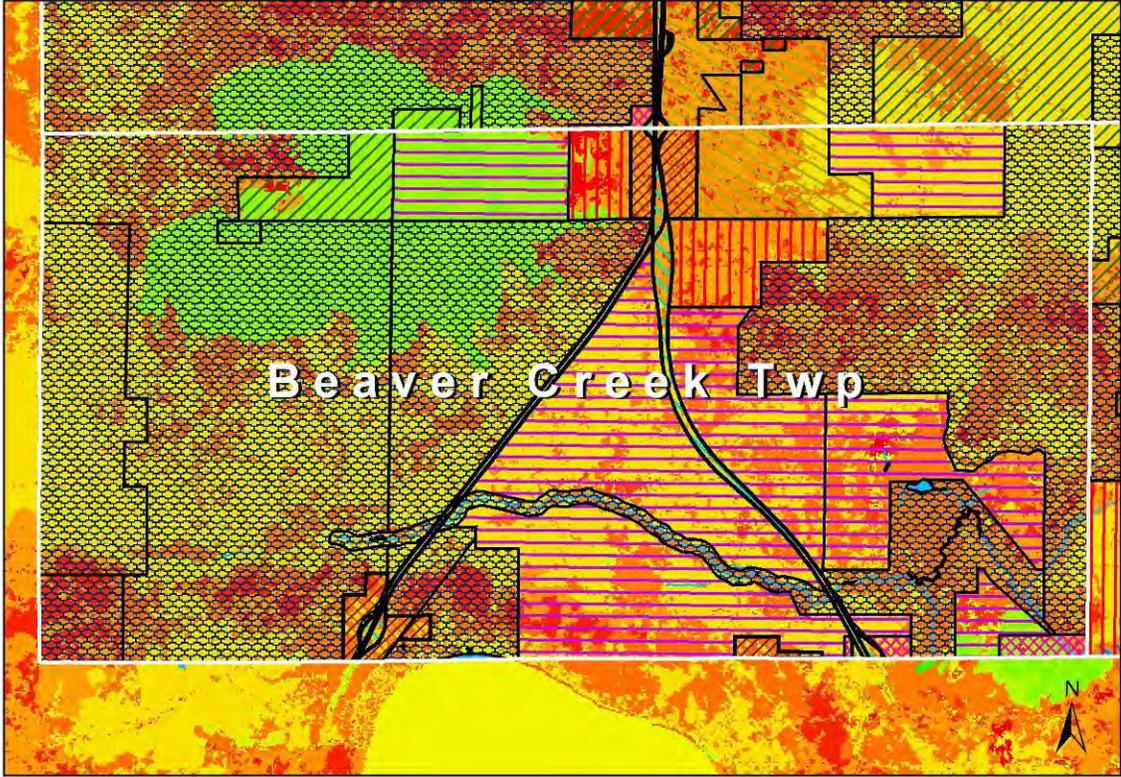
- | |
|---|
|  Higher Risk |
|  Lower Risk |

 Lakes

 Rivers



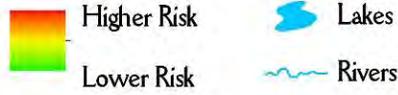
Beaver Creek Township Wildfire Risk Areas & Zoning Districts



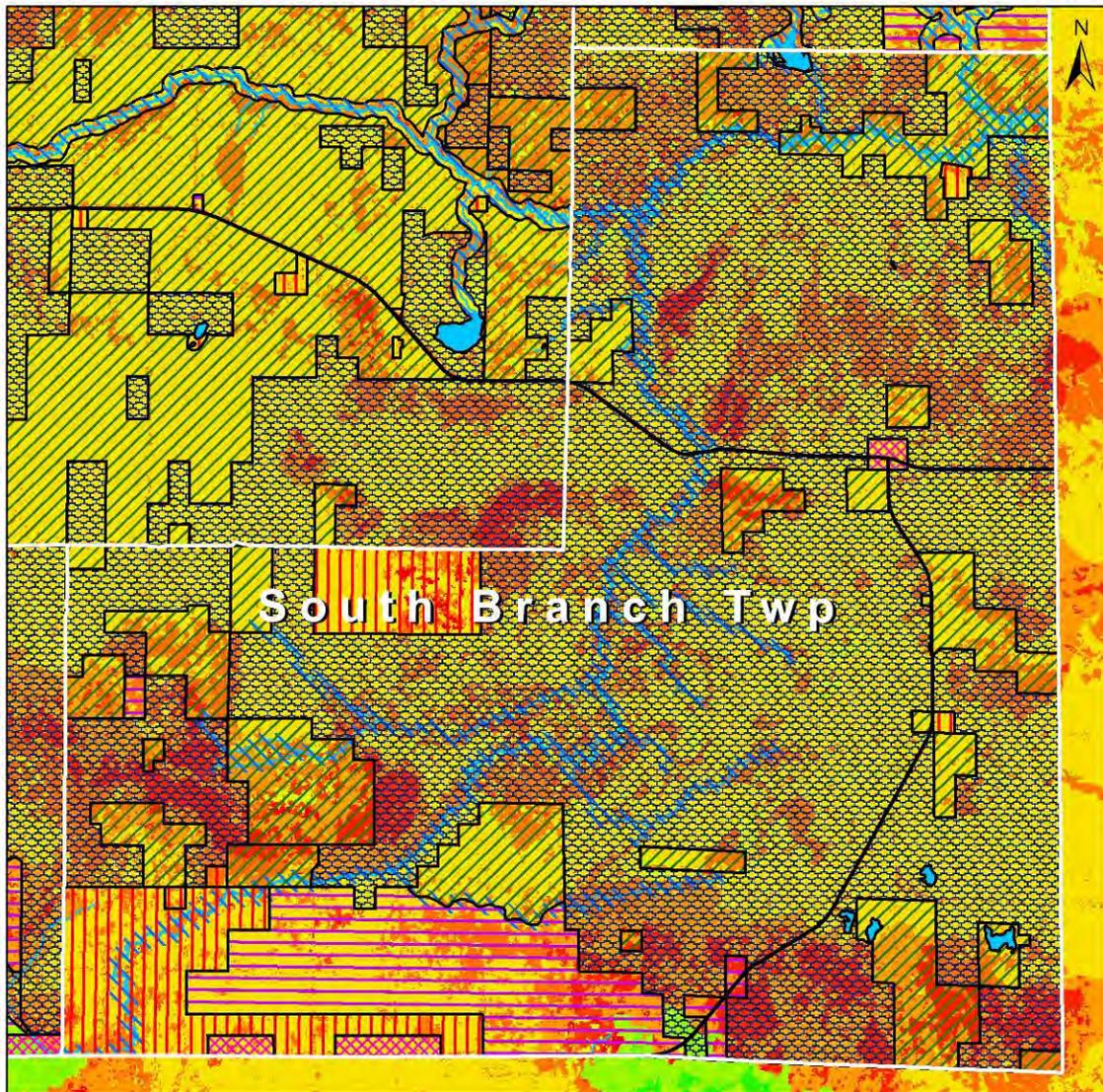
Map prepared by the Northeast Michigan Council of Governments
Data Source: US Forest Service

South Branch Township Wildfire Risk Areas & Zoning Districts

Wildfire Hazard Level



- Commercial & Business
- Farm & Forest
- Low Density Residential
- Mixed Residential
- Resource Conservation
- Stream Overlay District



0 1 2 Miles

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

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 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 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 (MFFPA) as a way to further the message of fire prevention. (Source: HMF Fire Management 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.

Compartment Listing

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+fee | 4-6feet | 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 | | | |

**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 | 14to2.5 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

| 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 | | | |

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 4.4.1
Value Rating**

| | 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 | | | |

| Table 4.4.2 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 | | | |

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:

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

Protection Capability ratings are:

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

Ignition Risk factors include:

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

- 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:

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

Protection Capability ratings are:

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

Ignition Risk factors include:

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

- 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:

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

Protection Capability ratings are:

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

Ignition Risk factors include:

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

- o Recreation: Developed recreation site within or adjacent to area (**High**)
- o Administrative: Administrative sites are present (**Moderate**)
- o Wildlife/Fisheries: Moderately significant habitat. (**Moderate**)
- o Range Use: Little or no range use (**Low**)
- o Watershed: Stream Class III, IV, VI. Little riparian vegetation. No mass movement potential (**Low**)
- o Forest/Woodland: Standing timber/woodland on 51+% of area (**High**)
- o Plantations: 31+% or less of area in or programmed for plantations (**High**)
- o Private Property: High loss and threat potential due to numbers and placement (**High**)
- o Cultural Resources: Minimal archaeological/historical findings, potential for Native American use. (**Moderate**)
- o Special Interest Areas: Area is adjacent to a Special Interest area (**Moderate**)
- 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 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 are 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:

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

Protection Capability ratings are:

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

Ignition Risk factors include:

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

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. |
| Mod | 1: South Branch Township. |

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

Fire History

| Rating | Compartment |
|--------|---------------------------|
| 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

| Rating | Compartment |
|--------|---------------------------|
| 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

| Rating | Compartment |
|--------|---------------------------|
| 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. |

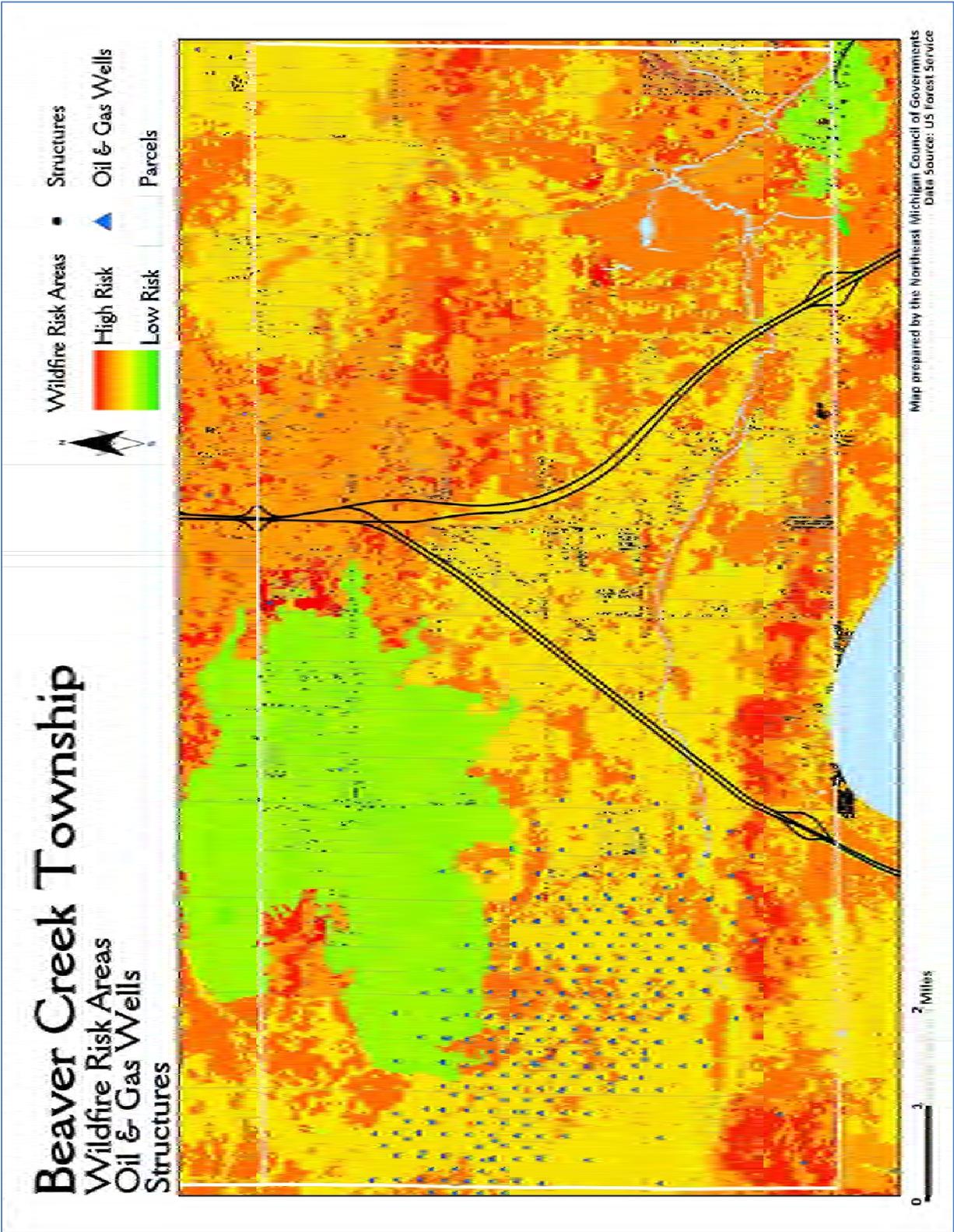
Compartment Assessment Ranking

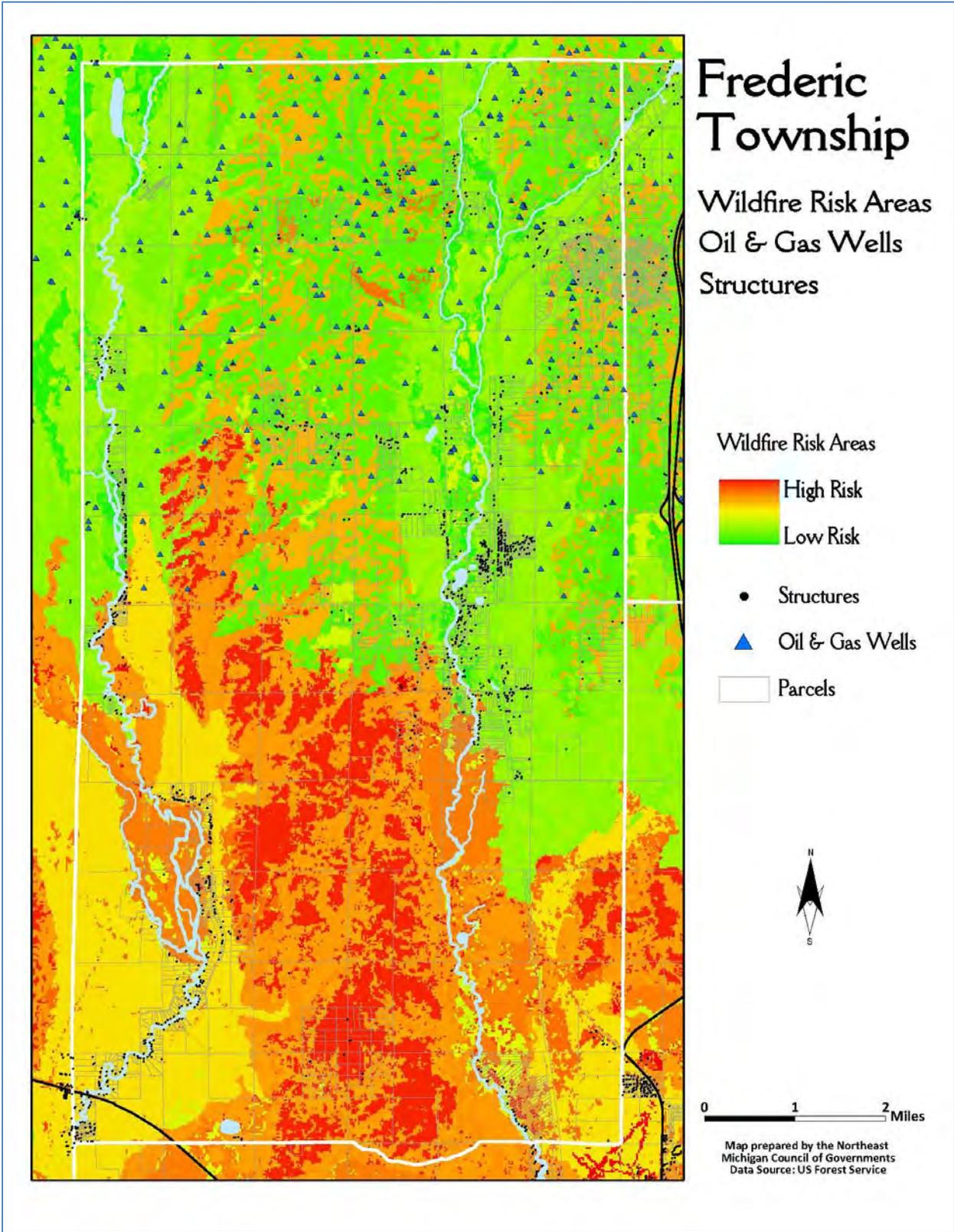
The end output of the RAMS analysis is a Composite Compartment Assessment Rating. Communities with high ratings include Grayling Township and South Branch Township. Further consideration of National Guard influences and resulting increased ignition sources, Lovells Township should have a high rating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

| Rating | Compartment |
|--------|---------------------------|
| 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 Maps

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





City of Grayling

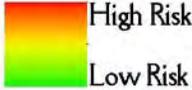
Wildfire Risk Areas

Oil & Gas Wells

Structures



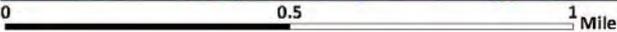
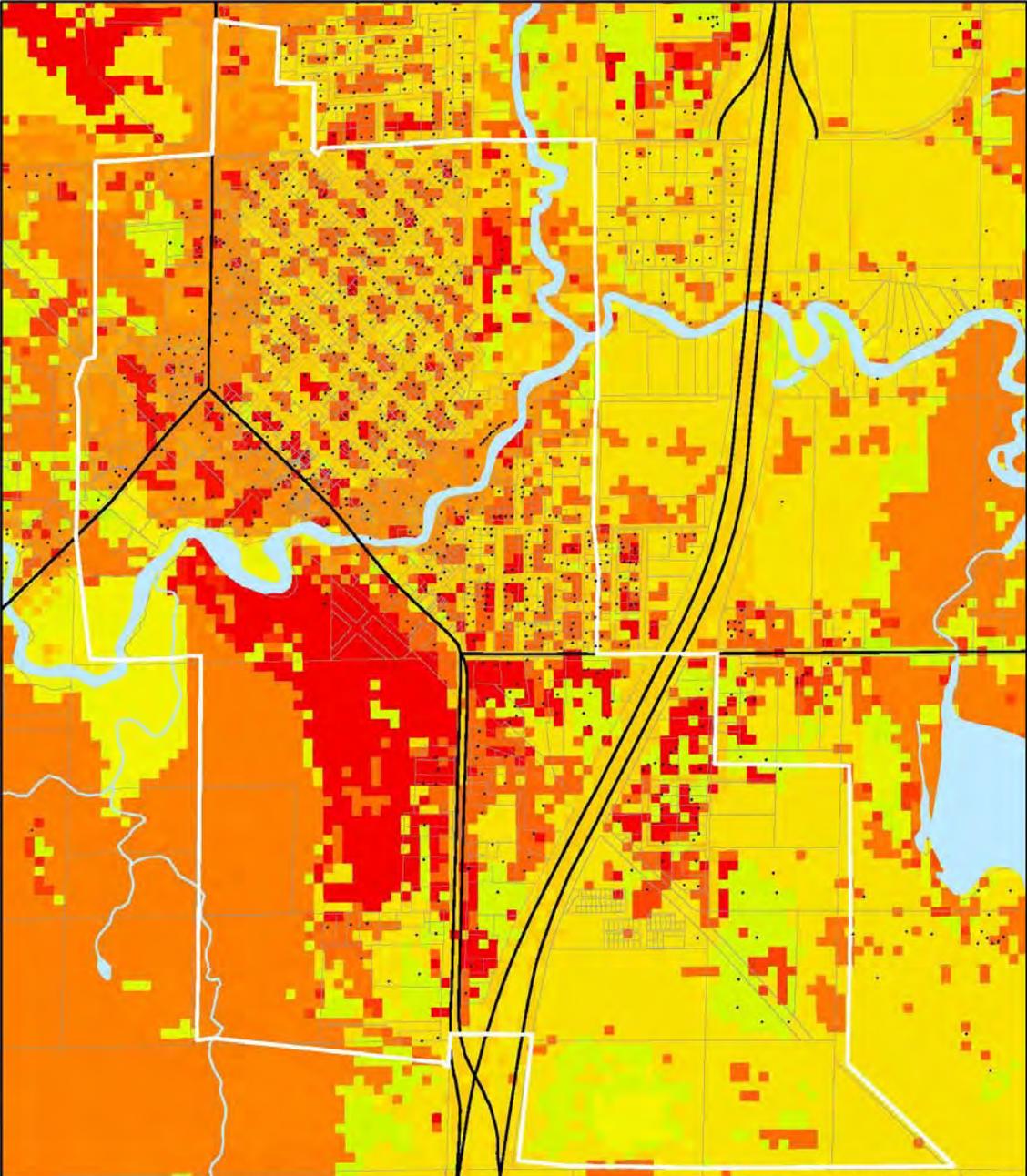
Wildfire Risk Areas



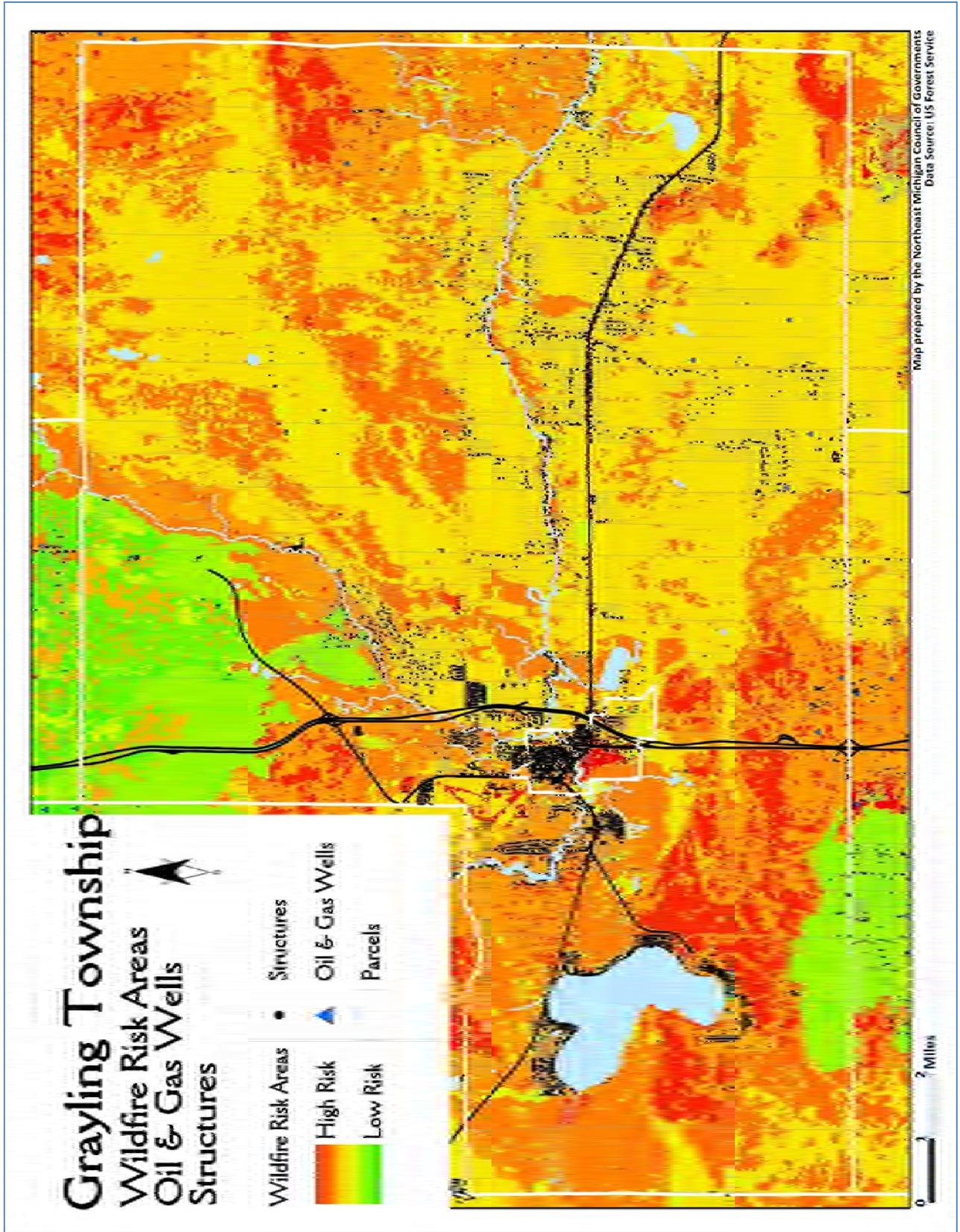
• Structures

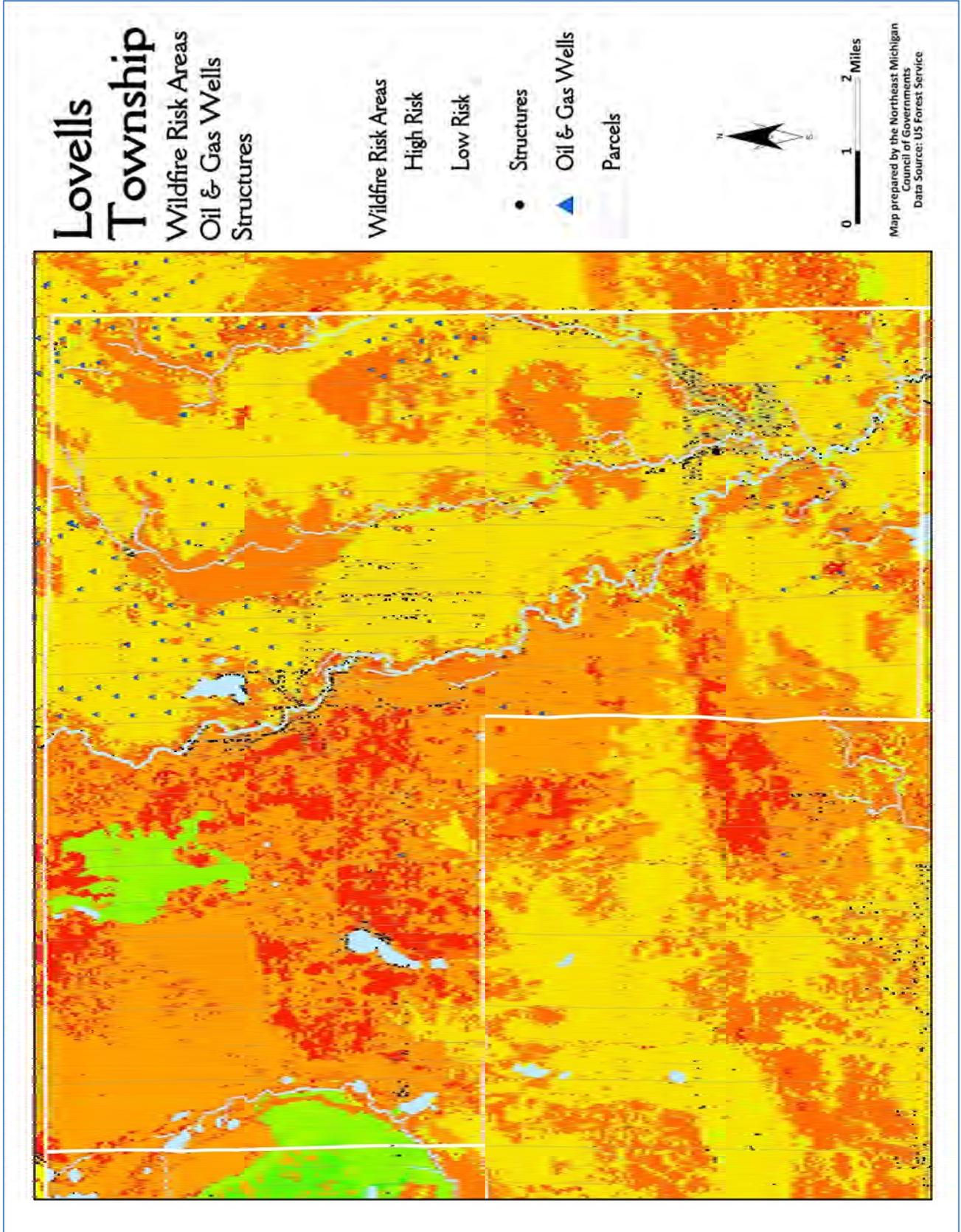
▲ Oil & Gas Wells

▭ Parcels



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





Maple Forest Township



Wildfire Risk Areas
Oil & Gas Wells
Structures

Wildfire Risk Areas

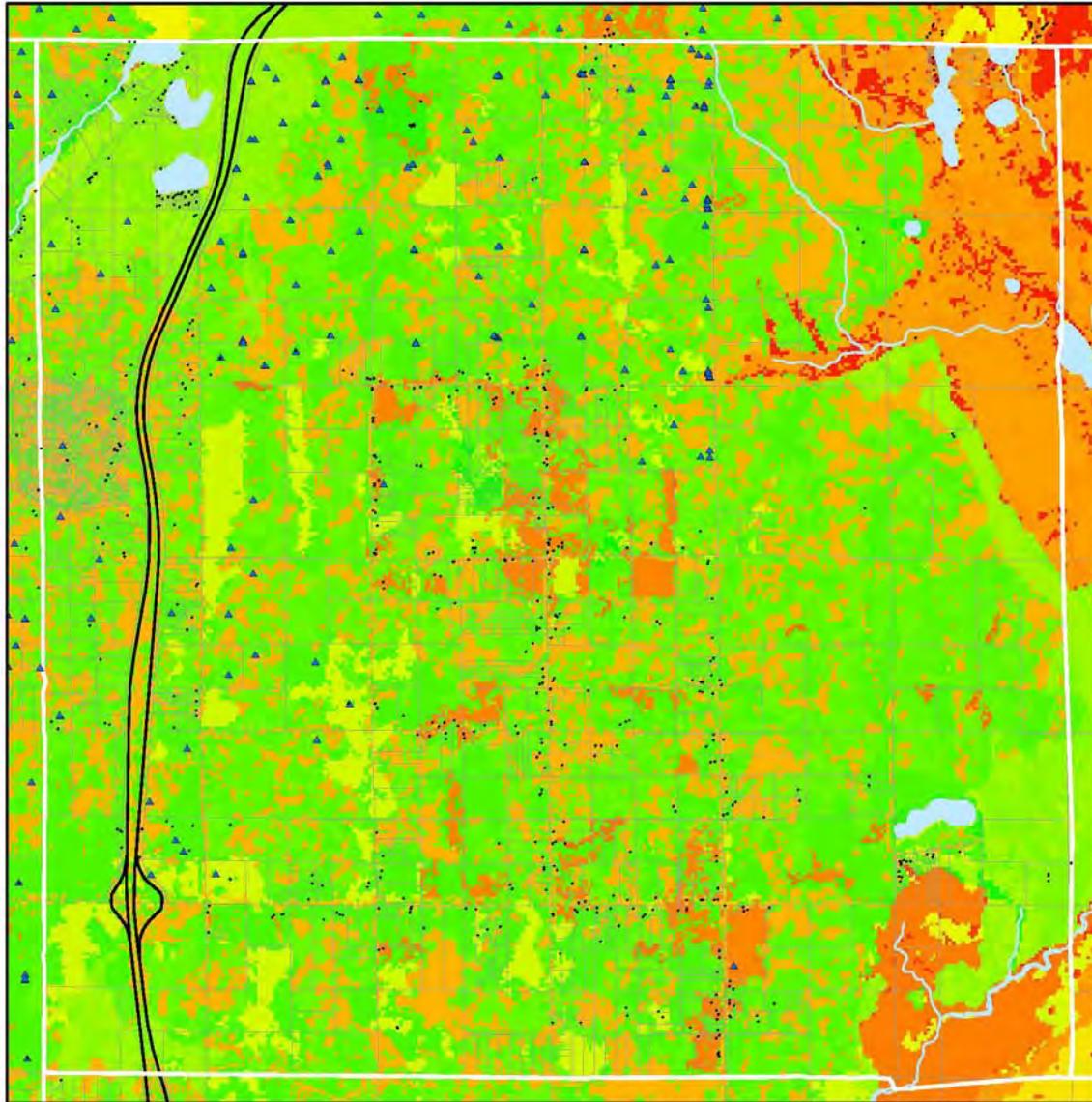
• Structures

High Risk

▲ Oil & Gas Wells

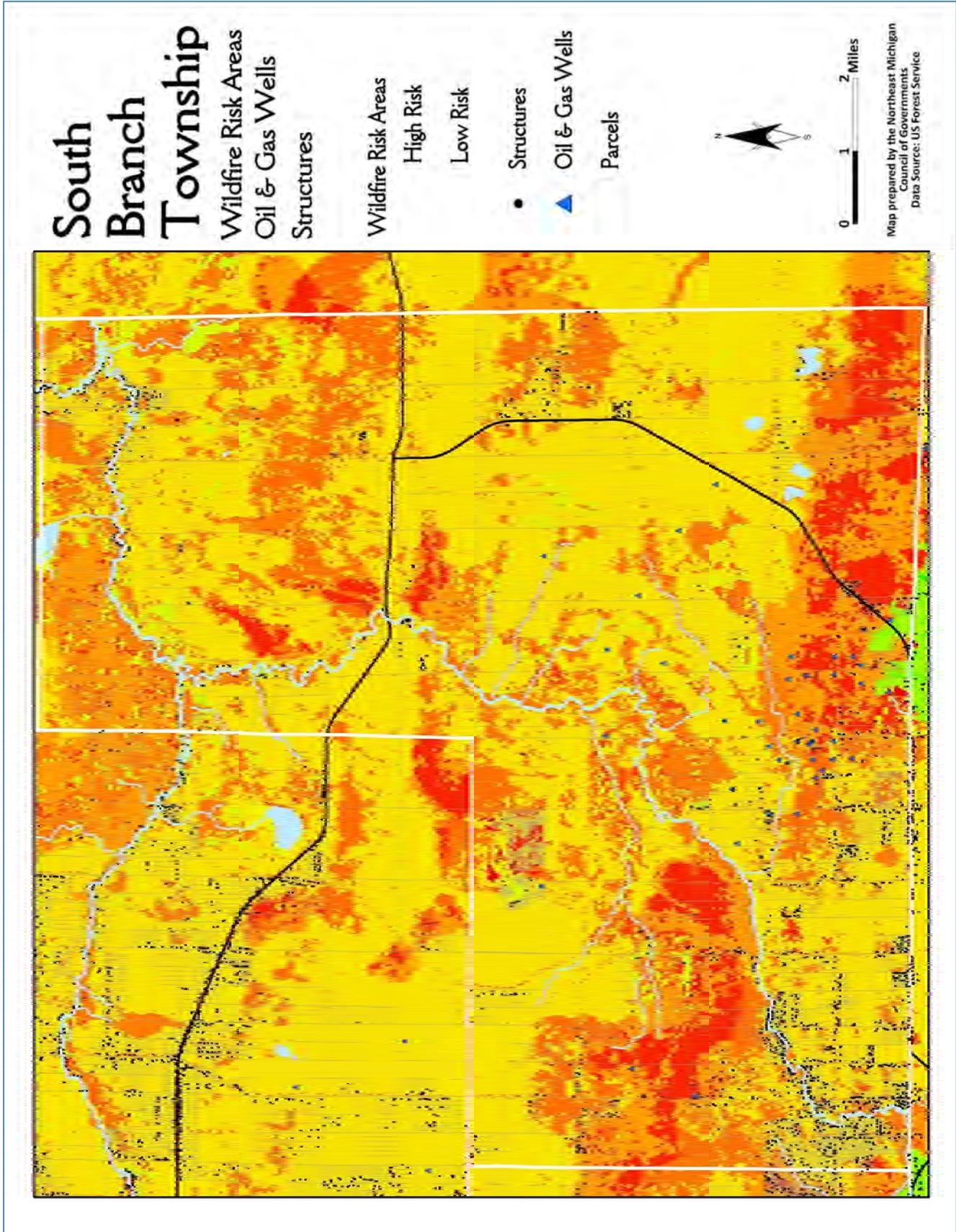
Low Risk

▭ Parcels



0 1 2 Miles

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



Chapter 5

Mitigation Action Plan

Mitigation Strategies

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

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.

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

The Firewise Construction standards, 2006 International Wildland / Urban Interface Code and 2006 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 to collect.
- 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

FEMA and the Institute for Business and Home Safety (IBHS) are two organizations that conduct evaluations and suggest revisions for insufficient or inappropriate codes. The IBHS is an insurance industry research center dedicated to maintaining specific building code standards to reduce deaths, injuries, property damage, economic losses and human suffering caused by natural disasters such as wildfire, tornadoes, freezing weather and hail. The IBHS maintains a program called Its “Fortified...for safer living” which specifies construction, design, and landscaping guidelines to increase a new home’s resistance to disaster from the ground up. Additional recommendations for fortification can be viewed at the IBHS website, www.ibhs.org.

The Building Code Effectiveness Grading Schedule (BCEGS) is maintained by Insurance Services Office, Inc. (ISO), which also rates fire-protection services. The BCEGS is a national measure of local building codes and code enforcement and is used by the insurance industry to determine how well new construction is protected from non-flood natural hazards. The BCEGS operates under the assumption communities with well-enforced, up-to-date codes will experience fewer damages. Homeowners within the participating communities can therefore receive lower insurance rates. This often provides communities with enough incentive to rigorously enforce their building codes.

Standards for Manufactured Homes

Manufactured or “mobile” homes are usually not regulated by local building codes since they are built in out-of-state factories and then shipped to sites. However, manufactured homes must comply with the U.S. Department of Housing and Urban Development’s National Manufactured Home Construction and Safety Standards put into effect June 15, 1976 and meet local standards for on-site installation in terms of location and technique. The greatest mitigation concern with manufactured housing is protection from wind damage, which is best achieved through appropriate installation.

FEMA’s Building Performance Assistance Team (BPAT) found that newer manufactured housing, designed to better transmit wind up-lift and overturning forces to the foundation, performed better when anchored to permanent foundations. Unfortunately, they also found that building officials were often unaware of manufacturer’s installation guidelines with respect to permanent foundations. The Michigan Department Environment Quality (MDEQ) has a Manufactured Housing Program which conducts the following activities: plan review for new construction of manufactured housing developments, initial inspections; work with the Michigan Department of Consumer and Industry Services for agreements, certifications, enforcement, and annual inspections where needed; and on-site water and wastewater inspections.

Planning, Zoning, and Capital Improvements Planning

Land-use planning and zoning are governmental functions critical to public safety—including fire protection. But because these functions are political as well, they are subject to intense differences of opinion and to public controversy. Therefore, they tend to lag behind development until the problem becomes aggravated, much in the fashion of the traffic light that is installed only after eight or ten deaths have occurred at the intersection. Being political they are also subject, even after enactment into law, to pressures for variances and modifications. Therefore, they are seldom as effective as fire protection personnel would like to see them. With few exceptions, they cannot be made retroactive and, consequently, older developments are not much affected by them. Where land-use planning and zoning have been enforced, however, they have achieved significant degrees of fire safety (Oreg. St. Dep. For. 1978b, San Bernardino County Bd. Sup. 1974).

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. They do this by designating land uses that are compatible to the natural conditions of the land, such as open space or recreation in a flood plain, or by simply allowing developers more flexibility in arranging structures on a parcel of land through the planned development approach.

Comprehensive planning is the primary tool used by communities to address future development. Master Plans can reduce future wildfire damages by recommending Firewise landscaping and construction to reduce the ignition of homes. Unfortunately, they are not always connected to implementation ordinances and do not always consider natural hazards in specific land use recommendations. Crawford County and all minor civil divisions have Master Plans. An analysis of those plans can be found in Chapter 3.

Zoning is considered one of the primary tools to implement a community master plan. Zoning regulates development by dividing communities into zones or districts and setting development criteria, such as types and densities, for each zone or district. 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 (such as subdivisions, condominium, commercial, recreational and industrial) to have two egress ingress roads; and house addresses to be displayed on 911 signs at the driveway end.

Another important zoning tool available to communities is the Planned Unit Development (PUD). Use of PUDs provides flexibility to both the community and developer 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 for the next 5 to 20 years. 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.

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
- 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

National Firewise Communities Program in 2005 to reflect 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
- 4) compilation of hazard rankings into a usable format

The objective should be preventing ignition of structures and that water supplies, road width, and street signage were 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.

Building Codes

The International Code Council, Inc. (ICC) produced the International Urban-Wildland Interface Code® in 2003. The ICC is a nonprofit organization dedicated to developing single sets of national model construction codes.

The International Code Council, Inc. (ICC) produced the International Urban-Wildland Interface Code® in 2003. 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 and bridges the code requirements of the pre-existing International Building Code® and the International Fire Code®. 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.

Vegetative fuel clearance`

A major provision of many ordinances concerns the distance between heavy vegetation types and the proposed or existing structures. 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. In conjunction with codes regulating vegetation fuel clearance, vegetative maintenance is critical for managing dangerous fuel loads in high fire risk areas.

Roadway and driveway standards

These standards ensure access for large emergency vehicles by stipulating minimum road/drive widths, minimum vertical clearance, an appropriate surface material, maximum grade, turnaround distances and radii, street identification, and premise identification.

Subdivision Regulations

These regulations set construction standards and govern how land will be subdivided. These standards generally address roads, sidewalks, utilities, storm sewers and drainage-ways. They can include the following hazard protection standards:

- Identification of all hazardous areas;
- Road standards that allow passage of firefighting equipment and snow plows and are no more than one foot below flood elevation;
- Buried power or phone lines;
- Minimum water pressures adequate for firefighting; and
- Subdivisions without access to public water sources should provide water source either by providing water storage or a water well with adequate water pressures.

The purpose of Michigan's Land Division Act of 1967, formerly known as the Subdivision Control Act, is to regulate the division of land; promote the public health, safety, and general welfare; promote the orderly layout and use of land; provide for proper ingress and egress to lots and parcels; promote proper surveying and monumenting of land subdivided and conveyed by accurate legal descriptions; provide for the approvals to be obtained prior to the recoding and filing of plats and other land divisions; provide for the establishment of special assessment districts and for the imposition of special assessments to defray the cost of the final plat; establish the procedure for vacating, correcting, and revising plats; control residential building development within floodplain areas; provide for reserving easements for utilities in vacated streets and alleys; etc. It also allows county drain commissions to publish rules governing the internal drainage of proposed subdivisions and outlets for drainage.

Open Space Preservation

Another approach to preventing damage to new developments is to limit, prevent, or remove development within hazard areas such as flood plains. Open space can be maintained in agricultural use or can serve as parks, greenway corridors, and golf courses. Community master plans play an important role in increasing awareness of natural areas and helping to encourage preservation and protection of more open spaces. Capital improvement plans and comprehensive Master Plans can also identify areas to be preserved through any or all of the following means:

- Acquisition;
- Dedication by developers;
- Dedicating or purchasing an easement to keep the land open; or
- Specifying setbacks or buffer zones where development is not allowed.

Site Modification

Natural hazards, particularly wildfires can damage undeveloped areas as well as threaten people and improved property. With the use of Firewise strategies conditions can be modified to reduce risks and damages associated with wildfires.

For example, a home may survive a wildfire because a "defensible space" was created and maintained between it and adjacent wild lands. This "defensible space" is similar in concept to that of "firebreaks", wherein brush and other fuel are cleared away in areas of state and national forests. A clearing around homes for at least 30 feet on all sides will discourage wildfires from spreading directly to them. Proper maintenance of adjacent property including short grass, thinned trees, removal of low-hanging branches, selection of fire-resistant vegetation, etc. is also helpful in keeping wildfires away. The need for local homeowners to "fireproof" their properties is probably the county's primary wildfire vulnerability.

Retrofitting

An alternative to modifying the site to keep the hazard away is to modify or "retrofit" the site or building to minimize or even prevent damage. There are a variety of techniques to do this. This section looks at the measures that can be implemented to

protect existing buildings from damage by wildfires, structural fires, floods, sewer backup, tornadoes, high winds, winter storms, hail, and extreme temperatures.

Modifications to prevent damages from wildfires not only include the creation of a “defensible space” but also a number of other very effective actions such as the use of fire-resistant siding and roofing materials as well as functional shutters and heavy fire-resistant drapes. Homeowners can sweep clean their roofs, decks and eaves to prevent blowing embers from igniting twigs and leaves. They can move woodpiles and combustibles away from buildings enclose eaves and any openings under structures that would allow blown embers in, and clean up yard and house waste and flammable oils and spills, which are generally in garages and driveways. They can assure that driveways are wide, high, and level enough and bridges are strong enough for fire equipment to access the property particularly in hilly areas where space can be limited, and can clearly display their addresses so that fire fighters can identify them. Homeowners can also make sure that adequate water supply has been identified for fire-fighters.

The National Wildfire/Urban Interface Fire Program sponsors a program, called Firewise Communities/USA that is intended to help protect urban communities from wildfires. Through preparedness and education, participating communities are guided through this three-tiered planning process:

- Wildland fire staff from federal, state, or local agencies provides a community with information about co-existing with wildfire along with mitigation information tailored to that specific area.
- The community assesses its risk and creates its own network of cooperating homeowners, agencies and organizations.
- The community identifies and implements local solutions.

Modifications to prevent damages from structural fires include: the safe installation and maintenance of electrical outlets and wiring; the installation of firewalls; and provision of equipment needed to inhibit fire dangers (such as sprinkler systems, smoke alarms, and fire extinguishers). In urban areas, the denser pattern of development may allow a fire in one structure to spread to one or more other structures. Appropriate firewall use in connected units or downtown commercial/pedestrian strips can help to protect property against the spread of fire. Older attached structures especially should be checked for safety and code compliance.

Any special facility such as a nursing home, day care center, or health clinic should ensure that it has a workable fire plan and is equipped with the equipment needed to inhibit fire dangers, such as sprinkler systems, functioning smoke alarms, and usable fire extinguishers. In rural areas, proper education on and maintenance of non-utility heat sources will help allay this hazard. The National Fire Protection Association has information available for homeowners on how to prevent fires. Proper cleaning of chimneys, fire places and wood stoves, keeping objects away from heating sources to prevent malfunction or ignition, and proper installation and fueling of heaters are all important. Space heaters should be at least three feet from objects.

Insurance

Insurance does not mitigate damage caused by a natural hazard. However, it does help the owner repair, rebuild and afford to incorporate some of the other mitigation measures in the process. A standard homeowner's insurance policy will cover a property for the hazards of wildfire. Each company has different amounts of coverage, exclusions, deductibles, arrangements, and costs. Most insurance policies will only pay for the replacement costs of the home and personal property. In addition, it may take up to a year or more to rebuild and return to a new home.

Critical facilities should be inventoried and proper insurance coverage should be reviewed and insured. Larger local governments can self-insure and absorb the cost of damage to one facility, but if many properties are exposed to damage, self-insurance can be a major drain on the treasury. Communities cannot expect federal disaster assistance to make up the difference.

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.

One of the first duties of a local government is to protect its own facilities. Fire stations, water treatment plants and other critical facilities should be a high priority for retrofitting projects and insurance coverage. Often public agencies discover after the disaster that their "all-hazard" insurance policies did not cover the property for the type of damage incurred.

Providing basic information to property owners is an important action that can be taken to support property protection measures. Another step is to help pay for a retrofitting project. Financial assistance can range from full funding of a project to helping residents find money from other programs. Some communities assume responsibility for sewer backups, street flooding, and other problems that arise from an inadequate public sewer or public drainage system. Less expensive community programs include low-interest loans, forgivable (after a certain period of occupancy) loans and rebates. These approaches don't always fully fund the project but they either cost the community less or increase the owner's commitment to the retrofitting project. In addition, communities can assist residents with referrals to home repair programs and heating assistance programs.

The more common outside funding sources for hazard mitigation are listed below. Unfortunately, some are only available after a disaster, not before, when damage could be prevented. Following past disaster declarations, FEMA, the Emergency Management Division of the Michigan State Police (MSP EMHSD), and the Michigan Department of Natural Resources have provided advice on how to qualify and apply for these funds.

Pre-disaster funding sources:

- FEMA’s Pre-Disaster Mitigation (PDM) grants (administered by MSP EMHSD);
- FEMA’s Flood Mitigation Assistance (FMA) grants (administered by MSP EMHSD);
- Community Development Block Grant (CDBG) funds (administered by the Michigan Economic Development Corporation);
- Michigan Department of Natural Resources (MDNR); and
- Conservation organizations, such as the West Michigan Land Conservancy, although generally these organizations prefer to purchase vacant land in natural areas, not properties with buildings on them.

Post-disaster funding sources:

- Insurance claims; and
 - The National Flood Insurance Program’s Increased Cost of Compliance provision, which increases the claim payment to cover a flood protection project required by code as a condition to rebuild the flooded building (administered by FEMA).
- Post-disaster funding sources based on a Federal disaster declaration:
- FEMA’s disaster assistance for public properties. However, the amount of assistance will be reduced by the amount of flood insurance that the public agency should have carried on the property (administered by MSP EMHSD);
 - Small Business Administration (SBA) disaster loans (for non-governmental properties); and FEMA’s Hazard Mitigation Grant Program (HMGP) funds (administered by MSP EMHSD).

The community can be the focal point in an acquisition project. Most funding programs require a local public agency to sponsor the project. The county or a municipality could process the funding application, work with the owners, and/or provide some or the entire local share. In some cases, the local government would be the ultimate owner of the property, but in other cases a public agency could assume ownership and maintenance responsibilities. The West Michigan Land Conservancy is an organization that can help by purchasing and holding certain lands until a government agency or other party can take possession.

Resource Protection

Resource protection activities are generally aimed at preserving (or in some cases restoring) natural areas as development occurs so that these areas can, in turn, provide hazard protection. For instance, watersheds, floodplains, and wetlands can reduce runoff from rainwater and snow melt in pervious areas; reduce overland flood flow and store floodwaters; remove and filter excess nutrients, pollutants and sediments; absorb flood energy and reduce flood scour; and recharge groundwater. These natural benefits can be preserved through regulatory steps for protecting natural areas or natural functions. General regulatory programs are discussed in the section on Preventive Measures. This section covers resource protection programs and standards, including the following:

- Fuels management
- Active forest management and timber harvesting
- Best management practices;
- Urban forestry;

- Wetland protection;
- Erosion and sedimentation control;
- River restoration;
- Dumping regulations; and
- Farmland protection.

Urban Forestry

The major damage caused by winds and snow/ice/sleet storms is to trees. Downed trees and branches break utility lines and damage buildings, vehicles, increase wildfire fuel loading, and anything else under them. An urban forestry program, developed by a municipality, can reduce the damage potential of trees by addressing proper tree care prior to a storm and recommend actions for managing trees before, during, and after a storm. Urban foresters or arborists can select hardier trees that better withstand high wind and ice accumulation and trees that are shorter than utility lines for use in power and telephone line rights-of-way. They can review damaged trees to determine if they should be pruned or removed.

A properly written and enforced urban forestry plan can lessen the frequency of fallen trees and limbs caused by wind and ice build-up, reduce liability, assist in assuring that utility lines are not damaged, and provide guidance on repairs and pruning after a storm. Such a plan helps a community qualify to be a "Tree City USA". "Tree City USA" is a program sponsored by The National Arbor Day Foundation, in cooperation with the USDA Forest Service and the National Association of State Foresters, to ensure that every qualifying community has a viable tree management plan and program. It provides direction, technical assistance, public attention, and national recognition for urban and community forestry programs.

In addition, utility companies are heavily involved in tree management. A recent Consumers Energy brochure states that; since the company is responsible for providing safe, reliable electricity; employees (and companies hired to help) "are sent out on a planned, rotating schedule to clear trees and bushes from electric rights-of-way". Following guidelines from the National Arborist Association and working under required permits, Consumers Energy promises the following actions:

- Trees next to distribution lines, which carry electricity from pole to pole, will be trimmed a safe, clear distance from lines.
- The safety of employees and the public, particularly children, may require removal of a tree. A tree may have to be removed because it is dead, dying, damaged, or subject to falling because of wind or a shallow root system-making it a safety and power outage threat. Some fast-growing trees can be a continuing hazard and may have to be removed.
- Trimming methods are aimed at helping the tree heal, decreasing future trimming needs, and directing future growth away from electric lines.
- The need for these activities is eliminated when utility lines are buried. Burying the lines is recommended when they are being upgraded or installed for new developments.

Public Education and Awareness

Public education and awareness programs are necessary to periodically inform the public (property owners, renters, businesses and local officials) about the wildfire hazard in Crawford County, the measures necessary to minimize potential damage and injury, and what actions are being taken. This information is primarily intended to precipitate appropriate actions. Information can be disseminated through the media (newspapers, newsletters, websites, television, radio, etc.) and at public forums and civic meetings. It can be distributed through schools and made available in public buildings or shopping areas. Brochures can be available at libraries and government offices, including building inspection offices. Special populations can be reached through direct mailings, workshops, and seminars. Signage along hazardous areas can also be effective.

Distribution of Existing Information

There is a great deal of information regarding hazards and hazard mitigation available to communities and the public on the national level. The Institute for Business and Home Safety gives detailed information on how to increase a new home's resistance to disaster; which is helpful to homeowners, building inspectors, and builders; through its "Fortified...for safer living" program. The National Wildfire/Urban Interface Fire Program provides information about co-existing with wildfire along with mitigation information through its "Firewise Communities/USA" tailored program. The National Fire Protection Association has information available for homeowners on how to prevent fires. The National Arbor Day Federation provides direction on tree management.

Unfortunately, this information doesn't always reach the intended target audience; whether that audience is communities, the general public, or specific populations. Local efforts can be made to select pertinent information and get it out to places and people where it is needed (such as information on wildfire hazards to campers). Programs and web sites can be publicized. Brochures can be stockpiled and distributed. This information can be very helpful, although it is not specific to the community.

Fire Prevention Activities by the US Forest Service

- Planned fuelbreaks will be completed as soon as time and funding allow. All fuelbreaks 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 fuelbreaks will be considered/created as time and funding allows. Maps showing the location of existing fuelbreaks will be provided to the local VFD have jurisdiction in that area.
- 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.
- 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.)

- 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.
- 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.
- The Forest Service will jointly participate with the MDNR and/or VFDS'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.
- As request 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.

Wildfire Mitigation Actions

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, such as Crawford, 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 goals and objectives for wildfire hazard mitigation actions. For each goal, there are several objectives and under each objective, there are several action items. These action items are "snapshots" of some of the alternatives discussed in the previous section.

The 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 Management Objectives were identified to meet the goals of the Crawford County Community Wildfire Protection Plan:

| Objective 1: Suppress wildfires using an appropriate management response, in a manner compatible with Management Area Objectives. | | |
|---|----------------------------------|-------------|
| Action Items: | Responsible | Year |
| 1. Adopt the National Incident Management System and incorporate NIMS principles into agency Policies and Procedures | Local Gov. MDNR USFS FD | Completed |
| 2. Conduct National Incident Management System Incident Command Training for all emergency first responders and utilize Incident Command during disaster exercises. | Local Gov. MDNR USFS FD | Ongoing |
| 3. Utilize NIMS Incident Command principles in all emergency responses. | Local Gov. MDNR USFS FD | Ongoing |
| 4. Develop procedures to notify/evacuate campers and river users (canoes, kayakers, fishermen) from hazard areas. The notification system would communicate with local liveries and fishing guides to notify river users in the risk area and to help get them out of the hazard area. This should be pursued through community partnerships with state and federal agencies along with local fire departments. | Local Gov. MDNR USFS FD | 2014 |

| Objective 2: 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. | | |
|---|--------------------------------------|-------------|
| Action Items: | Responsible | Year |
| 1. Communities and agencies should develop a partnership agreement that defines roles and responsibilities for each entity. | Local Gov. MDNR, FD USFS | 2013 |
| 2. Communities and agencies should adopt/endorse recommendations and strategies of the "Firewise" program via resolutions or letters of support. | Local Gov. MDNR, FD USFS | 2013 |
| 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. MDNR, FD USFS, MSUE | 2014 |
| 4. Representatives from local fire departments and agencies will be trained to conduct Firewise education programs and Firewise home assessments. The intention is to train at least one person in each fire department to do homeowner Firewise 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 collecting. | Local Gov. MDNR, FD USFS | Ongoing |
| 8. Communities, local fire departments and agencies will encourage creating defensible spaces around homes through the removal or reduction of flammable vegetation including vertical clearance of tree branch. Specifically, this involves minimizing the volume of combustibles (e.g. surface litter such as dry leaves, pine needles, dead and dying foliage and trees, and removal of propane tanks) in the safety zone around the structure. | Local Gov. MDNR, FD USFS | Ongoing |
| 9. Communities and local fire departments will promote creating better ingress and egress to homes including clearance of trees along access roads, widening access roads to 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 |
| 11. The County will continue to incorporate current Firewise Construction Standards, International Wildland Urban Interface Code and the current 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 | 2014 |
| 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. Local Fire Departments will seek funding to develop a mobile Firewise education booth to be used at community events. This will require purchasing materials and equipment. | Local Gov. MSUE, FD, MDNR, USFS | 2014 |
| 16. Provide Firewise education training to staff at all fire departments, who can in turn promote the program at community events. | FD, MDNR USFS, MSUE | 2013 |
| 17. 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 | 2013 |
| 18. Develop handout for Firewise construction. | County, Local Gov. | 2014 |

| 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 Assessing Wildfire Hazards in the Home Ignition Zone training for local volunteer fire departments | FD, MDNR USFS, MSUE, Local Gov. | Ongoing |
| 3. Local Fire Departments will conduct home assessments in the Wildland Urban Interface communities and surrounding areas. | FD | Ongoing |

| 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 will review the CWPP on an annual basis to monitor and assess whether the plan continues to meet the community's needs. | LPEC, Local Gov., MDNR, USFS, FD | January of each year |
| 2. Activities associated with implementing the CWPP will be discussed at each Crawford County Fire Chief's 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. Develop a comprehensive fuelbreaks plan using GIS technology to identify needs, map potential fuelbreaks and determine options to install fuelbreaks and provide long term maintenance. The process will identify fuelbreaks on public and private properties. | MDNR, USFS | 2014 |
| 3. After completion of the comprehensive fuelbreaks plan has been completed, develop specific plans to fund and develop various stretches of fuelbreaks 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 fuelbreaks on public lands that will strengthen existing and proposed mitigation strategies. | MDNR, USFS | *Ongoing |
| Note: due to fluctuating finding amounts, these activities will be completed as time and budgets allow. | | |

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| <p>Objective 6: Implement Firewise planning and zoning strategies at the local level. Implementation of action items under this objective are the responsibility of each individual community to incorporate into their planning and zoning. 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.</p> | |
| <p>Community Master Plan Action Items</p> | |
| <p>1. Natural Resource section: identify general forest types, high risk wildfire areas, steep slopes and hydric soils, and draughty soils.</p> | <p>As plans are updated per Michigan Planning Enabling Act</p> |
| <p>2. Address Firewise Program in goals and objectives</p> | <p>As plans are updated per Michigan Planning Enabling Act</p> |
| <p>3. Future land use section: consider overlay zone or special issue area</p> | <p>As plans are updated per Michigan Planning Enabling Act</p> |
| <p>4. Zoning Plan section: identify zoning techniques for Firewise Community.</p> | <p>As plans are updated per Michigan Planning Enabling Act</p> |
| <p>Zoning Ordinance Action Items</p> | |
| <p>5. Use a Wildfire Overlay Zone in the zoning ordinance, whereby properties within the overlay zone will subject to additional standards to mitigate impacts of wildfires.</p> | <p>As zoning ordinances are amended</p> |
| <p>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.</p> | <p>As zoning ordinances are amended</p> |
| <p>7. Vegetative maintenance for managing dangerous fuel loads in high fire risk areas.</p> | <p>As zoning ordinances are amended</p> |
| <p>8. Roadway and driveway standards to ensure access for large emergency a. vehicles 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</p> | <p>As zoning ordinances are amended</p> |
| <p>County Planning Commission</p> | |
| <p>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 review and updated as 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.</p> | <p>March of each year</p> |

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| Objective 7: Provide fire prevention and fire suppression to the Camp Grayling base and 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 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 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 National Guard | Annually |
| 3. The MDNR and the Michigan National Guard co-manage National Guard lands. The MDNR and National Guard will continue to work in cooperation to develop and maintain fuelbreaks around impact zones and conduct prescribed burns as necessary. | MDNR National Guard | Annually |

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| Objective 8: With homes and dispersed outdoor recreational facilities, such as campgrounds and canoeing, located within high risk areas, it is extremely important provide mechanisms for informing people of wildfire and when necessary provide for evacuation to safe areas. | | |
| Action Items: | Responsible | Year |
| Implement Reverse 911 System to selectively notify homeowners in areas threatened by a wildfire. | County | 2014 |
| Establish procedures for notifying campground and canoe liveries | Local Gov. MDNR USFS | 2014 |

Special Considerations for Access, Ingress, Egress, and Evacuation Standards

When implementing these recommended guidelines, it is important to consider the following concerns: 1) Landowners who do not have easements across the lands they are using to access their property, will need to get proper approvals from the landowner before they can implement these actions. 2) Landowners who's access roads cross public lands will need to obtain proper permits from the appropriate agency prior to widening and improving ingress/egress roads. 3) Landowners who access roads are across public lands will need to get a permit from the appropriate agency prior to installing the signs.

Roads

1. Access for emergency responders, ingress, egress, and evacuation shall be provided for all buildings.

2. Roads shall be designed and constructed to allow evacuation simultaneously with emergency response operations.
3. Roads shall be not less than 20 feet of unobstructed width with a 13 and 1/2-foot vertical clearance.
4. Parking shall be allowed only where an additional 9 feet of improved road width is provided and only within that improved road width.
5. Roads shall be designed, constructed, and maintained to accommodate the load and turning radius of the largest apparatus typically used to respond to that location.
6. Roads shall have no grade in excess of 8 percent, unless mitigation measures can be agreed upon jointly by the fire department and the developer.
7. Dead-end roads in excess of 300 feet in length shall be provided with turnouts and turnarounds.
8. Every dead-end fire service access road more than 300 feet in length shall be provided with a turnaround at the terminus having a minimum radius of 50 feet to the center line, or alternatively shall have a “hammerhead T” turnaround to provide emergency vehicles with three-point turnaround ability.

Driveways

1. Where any point of a building is greater than 150 feet from a road, a driveway shall be provided to within 150 feet of the building.
2. Where the driveway is greater than 150 feet in length, it shall not be less than 12 feet in unobstructed width with 13 and ½ feet in vertical clearance.
3. Where the driveway is greater than 300 feet, it shall be provided with turnouts or turnarounds at locations approved by local fire authorities.
4. Required driveways shall have a grade not to exceed 10 percent, unless mitigation measures can be agreed on jointly by the fire department and developer or owner.
5. Culverts under driveways, away from the public road right of ways, shall meet standards for culverts as defined by the County Road Commission. The standards will enable heavy fire response vehicles to use the driveway to access structures.

Chapter 6 Implementation

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 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:

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

- 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 the three entities, along with local government and the local fire authority, 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 Crawford County city and county 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.
- 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 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 mile 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 fuelbreaks on Forest Service lands. Proposed, but not yet completed fuelbreaks 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.

Michigan State University Extension:

MSUE Firewise will provide 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 | Home Fest |
| Grayling Township and City | AuSable 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 | AuSable Watershed Committee Manistee River Restoration committee Huron Pines RC&D Council Manistee River Homeowners Association AuSable River Homeowners Association North Branch AuSable R. Association |

Crawford County

2013 Community Wildfire Protection Plan



The Crawford County Community Wildfire Protection Plan (CWPP) was developed under the Planning Guidance of the Healthy Forest Restoration Act of 2003. This community wildfire protection plan represents the efforts and cooperation of all local units of governments in Crawford County and a number of organizations and agencies. In addition, the plan represents the commitment of organizations working together to improve the preparedness for wildfire events in Crawford County while reducing factors of risk. The CWPP will support and complement the Crawford County Hazard Mitigation Plan.

Dave Stephenson, Chairperson
Crawford County Board of Commissioners

Date

Bill O'Neill

9/5/13

Bill O'Neill, State Forester
Michigan Department of Natural Resources

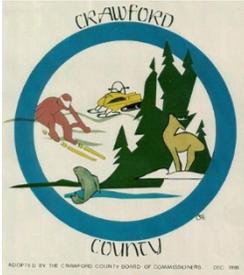
Date

United States Forest Service

Date

Crawford County

2013 Community Wildfire Protection Plan



The Crawford County Community Wildfire Protection Plan (CWPP) was developed under the Planning Guidance of the Healthy Forest Restoration Act of 2003. This community wildfire protection plan represents the efforts and cooperation of all local units of governments in Crawford County and a number of organizations and agencies. In addition, the plan represents the commitment of organizations working together to improve the preparedness for wildfire events in Crawford County while reducing factors of risk. The CWPP will support and complement the Crawford County Hazard Mitigation Plan.

Dave Stephenson, Chairperson
Crawford County Board of Commissioners

Date

Bill O'Neill, State Forester
Michigan Department of Natural Resources

Date

United States Forest Service

Date

Frederic Fire Department

Date

Grayling Fire Department

Date

Maple Forest Fire Department

Date

Lovells Fire Department

Date

Beaver Creek Fire Department

Date

South Branch Fire Department

Date