NEWAYGO COUNTY

Community Wildfire Protection Plan

2010 Edition

November 8, 2010

The purpose of the Newaygo County Community Wildfire Protection Plan is to protect human life and reduce property loss due to catastrophic wildland fire in Newaygo County. The Community Wildfire Protection Plan identifies and prioritizes Wildland/Urban Interface areas within Newaygo County for hazardous fuels reduction treatments and recommends methods for achieving hazardous fuels reductions. In addition, the plan outlines measures for reducing fire danger to the structures throughout Newaygo County at risk communities.

The Newaygo County Community Wildfire Protection Plan is a supporting plan to the Newaygo County Hazard Management Plan (Hazard Analysis and Hazard Mitigation Plan), which was approved by FEMA in April 2006. The Community Wildfire Protection Plan was developed under direction of the Newaygo County Emergency Services Department in conjunction with representatives from the following agencies:

- Newaygo County Local Emergency Planning Team
- Newaygo County Fire Chiefs Association
- State of Michigan Department of Natural Resources and Environment
- USDA Forest Service
- Michigan State University Extension Office, Land Use Educator

In order to accomplish the goals of the Community Wildfire Protection Plan, community leaders can assist by promoting and adopting the recommendations and strategies of the “Firewise” program, which include encouraging all residents living in the Wildland/Urban interface area to become acquainted with “Firewise” mitigation strategies to protect their property from wildfire hazards. In addition, community leaders can promote growth in a sustainable, hazard-free manner by incorporating Fire Mitigation Strategies into existing zoning ordinances, land use planning, and building code standards to ensure development will not put people in danger or increase threats to existing properties.

Questions and concerns related to content and use of this document should be directed to the Newaygo County Emergency Services Department.

Sincerely,
Abigail B. Watkins, Newaygo County Emergency Services Director

NEWAYGO COUNTY

COMMUNITY WILDFIRE PROTECTION PLAN

THE NEWAYGO COUNTY COMMUNITY WILDFIRE PROTECTION PLAN 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 A NUMBER OF ORGANIZATIONS AND AGENCIES; THROUGH THE COMMITMENT OF PEOPLE WORKING TOGETHER TO IMPROVE THE PREPAREDNESS FOR WILDFIRE EVENTS IN NEWAYGO COUNTY WHILE REDUCING FACTORS OF RISK. THIS IS A SUPPORTING PLAN TO THE NEWAYGO COUNTY HAZARD MANAGEMENT PLAN AND THE NEWAYGO COUNTY EMERGENCY ACTION GUIDELINES.

Adam Wright — 11/24/10

ADAM WRIGHT, Chairperson — Date

Newaygo County Board of Commissioners

Philip A Smalligan — 11/09/10

PHILIP SMALLIGAN, President — Date

Newaygo County Fire Chiefs Association

Cara A Boucher — 16 DEC 10

CARA BOUCHER, State Forester — Date

Michigan Department of Natural Resources and Environment

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Recent catastrophic wildfires in the State of Michigan, such as the 2007 Sleeper Lake Fire and the 2010 Meridian Fire, have highlighted awareness of the destructive potential of wildfires to local communities. Since the establishment of the National Fire Plan in 2001, and the passage of the Healthy Forests Restoration Act in 2003, hundreds of communities across the United States have developed community fire plans, engaged in Firewise activities, and taken action at a community level to reduce the risk to wildfire.
In 2009, under the auspices of the Newaygo County Board of Commissioners local, state, and federal agencies began the collaborative development of the Newaygo County Community Wildfire Protection Plan.

A Community Wildfire Protection Plan is a planning and prioritization process that helps communities establish local priorities to protect property and critical infrastructure from the risk of wildfire. Community Wildfire Protection Plans can take a variety of forms, based on the needs of the community involved in their development. They may address issues such as wildfire response, hazard mitigation, community preparedness, or structure protection—or all of the above. Newaygo County has chosen to adopt a county wide plan that reflects the rural nature of this forested county.

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 though alternative environmental compliance options offered under the Health Forests Restoration Act.

Roles and Actions for the Development and Implementation of the Newaygo County Community Wildfire Protection Plan

The Community Wildfire Protection Plan was developed under direction of the Newaygo County Emergency Services Department in conjunction with representatives from the following agencies:

- Newaygo County Local Emergency Planning Team
- Newaygo County Fire Chiefs Association
- State of Michigan Department of Natural Resources and Environment
- USDA Forest Service
- Michigan State University Extension Office, Land Use Educator

The following highlights the various roles and actions each agency contributed in the development and implementation of the Newaygo County Community Wildfire Protection Plan:

Newaygo County Local Emergency Planning Team:

- In 2007, the Newaygo County Local Emergency Planning Team (LEPT) was established by the Newaygo County Board of Commissioners as the permanent Emergency Management advisory body serving the functions of the Homeland Security Local Planning Team (LPT), SARA Title III Hazardous Materials Local Emergency Planning Committee (LEPC), Hazard Mitigation Council, and Citizen Corps Council to provide a forum for representatives of local government, private businesses, and public organizations to participate in community emergency planning and preparedness activities.

- Representatives of the Team include Newaygo County Board of Commissioners, Newaygo County Administration, Newaygo County Emergency Services, City and Township Representatives, Newaygo County Central Dispatch, Newaygo County Sheriff's Department, Newaygo County Police Chiefs Association, Newaygo County Fire Chiefs Association, Newaygo County Medical Control Authority, Private EMS companies, District 10 Public Health Department, Newaygo County Road Commission, Newaygo County Community Mental Health, Newaygo County Department of Human Services, Newaygo County Commission on Aging, American Red Cross, Newaygo County Regional Educational Services Agency, and private companies including Gerber Products, AT&T, Consumer's Energy, etc.

- The Local Emergency Planning Team is responsible for convening the core decision-making team that will be responsible for developing the plan and guiding its development.

- The Local Emergency Planning Team will reviews the final draft document before it is presented to the Newaygo County Board of Commissioners and Newaygo County Fire Chiefs Association for adoption.

County and City Government Officials:

- 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.

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.

- 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 and Environment**:*

- 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 Newaygo County Community Wildfire Protection Plan.
- To Provide statewide leadership in encouraging local, state, federal, and non-governmental stakeholders in development of the Newaygo County Community Wildfire Protection Plan and facilitate the participation of state personnel in the development process.
- Through established relationships with Newaygo 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 Newaygo 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.

Michigan State University Extension Office Land Use Educator:

- The Land Use Educator from the Michigan State University Extension Office is responsible for educating and building an informed group of community leaders responsible for the planning, zoning, and land policy and land use decision making.
- Bring specialized knowledge and technical expertise into the planning process, particularly in the areas of GIS and mapping, land use planning, and zoning.
- Recommending incorporating Fire Mitigation Strategies into existing zoning ordinances, land use planning, and building code standards to ensure development will not put people in danger or increase threats to existing properties.

Fire Policies and Programs:

Various local, state and federal programs and policies relate to fire protection and community fire planning. The Healthy Forest Restoration Act of 2003 calls for the development of Community Wildfire Protection Plans. This section describes requirements, as well as related county, state and federal programs.

Michigan State Forest Management Plan (2008)

The Michigan Department of Natural Resources and Environment (DNRE) is the agency of the State of Michigan charged with administering the 3.9 million acre State Forest System including natural resources such as state parks, state forests, and recreation areas. In accordance with Part 25, Sustainable Forestry on State Forest Lands, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, the State of Michigan department of Natural Resources and Environment (DNRE) developed the Michigan State Forest Management Plan. Components of the management plan include:

1. Identification of the interests of local communities, outdoor recreation interests, the tourism industry, and the forest products industry.

2. Identification of the annual production capability of the state forest and management goals based on that level of productivity.
3. Methods to promote and encourage the use of the state forest for outdoor recreation, tourism, and the forest products industry.
4. A landscape management plan for the state forest incorporating biodiversity conservation goals, indicators, and measures.
5. Standards for sustainable forestry consistent with section 52502 of Part 525.
6. Identification of environmentally sensitive areas.
7. Identification of the need for forest treatments to maintain and sustain healthy, vigorous forest vegetation and quality habitat for wildlife and environmentally sensitive species.

In addition, the State of Michigan Department of Natural Resources and Environment (DNRE) was certified under the standards of the Forest Stewardship Council (FSC) and the Sustainable Forestry Imitative (SFI) in accordance with Part 25, Sustainable Forestry on State Forest Lands, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, which requires the DNRE to seek and maintain third party certification of the management of the state forest that satisfies sustainable forestry standards of at least one credible certification program.

Under the Fuel Management section of the Michigan State Forest Management Plan, identified goals include:

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

Healthy Forest Initiative and the Healthy Forest Restoration Act of 2003

The purpose of the Healthy Forest Restoration Act of 2003 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.

In addition, the Healthy Forest Restoration Act also:

- Streamlines the administrative review process for the National Environmental Protection Agency (NEPA).
- Creates new regulations under the Endangered Species Act for National Fire Plan projects to streamline consultation with federal regulatory agencies.
- Sets the stage for discussion between the administration and Congress resulting in new legislation addressing forest health.
- Establishes new procedures provided for under the National Environmental Policy Act to allow priority fuel treatment (thinning and prescribed fire) and forest restoration (reseeding and planting) projects, identified through collaboration with state, local and tribal governments and interested persons, to proceed quickly without the need for lengthy environmental documentation.
- Improves the agencies' administrative appeal rules to expedite appeals of forest health projects and encourage early and more meaningful public participation.
- Provides guidance to Federal agencies to make consultations under the Endangered Species Act timelier while emphasizing long-term benefits to threatened and endangered species, and proposing new regulations under the Endangered Species Act (Section 7) to expedite consultation for forest health projects that are unlikely to harm threatened or endangered species or their habitat.
- Provides guidance from the Council on Environmental Quality to improve environmental assessments for priority forest health projects by preparing assessments for fifteen pilot fuels treatment projects.

Stewardship Contracting

In 2003, Congress has enacted legislation expanding stewardship contracting authorizing the USDA Forest Service and Bureau of Land Management to enter into long-term contracts (up to ten years) with small businesses, communities, the private sector, and nonprofit

organizations to meet land-management objectives, including reducing wildfire risks and improving forest and rangeland health. Stewardship contracts focus on producing desirable results on the ground that improve forest and rangeland health and provide benefits to communities. Among other things, the new stewardship contracting authority allows forest products to be exchanged for ecological restoration services, which may include thinning and removing brush.

The expanded 2003 stewardship contracting, which Congress approved will help agencies achieve key land-management goals to:

- Improve, maintain, and restore forest and rangeland health;
- Restore and maintain water quality;
- Improve fish and wildlife habitat;
- Re-establish native plant species and increase their resilience to insects, disease and other natural disturbances; and
- Reduce hazardous fuels posing risks to communities and ecosystem values through an open, collaborative process.

Title I Hazardous Fuels Reduction of the Healthy Forest Restoration Act (2003)

The Hazardous Fuels Reduction Act is a component of the Healthy Forest Restoration Act of 2003. Under this title, the act allows for authorized hazardous fuel reduction projects on federal lands that:

1. Are in wildland-urban interface areas
2. Are condition class 3 and located in proximity to a municipal watershed or water supply system with significant risk that a wildfire would adversely affect water quality or the system
3. Are condition class 2 within fire regime I, fire regime II or fire regime III within a municipal watershed or in proximity to a municipal water supply system or a stream feeding such a system with a significant risk that wildfire would adversely effect water quality or maintenance of the system
4. Are identified as an area where wind throw, blow down, ice storm damage, or the existence of insects or disease poses a significant threat to an ecosystem component, or forest or rangeland resource on federal land or adjacent non-federal land, or
5. Contain threatened and endangered species habitat, if: the natural fire regimes are important for, or wildfire is a threat to threatened or endangered species or their habitat; the authorized hazardous fuel reduction project will enhance protection from catastrophic wildfire, and; the Secretary complies with applicable guidelines in any management or recovery plan.

In addition, the Title I- Hazardous Fuels Reduction of the Healthy Forest Restoration Act of 2003 also:

- Requires authorized hazardous fuel reduction projects to be consistent with land and resource management plans and other administrative policies or decisions applicable to the federal land.
- Limits the acreage available for authorized hazardous fuel reduction projects to 20,000,000 acres.
- Provides direction for projects that may occur within old growth stands.
- Provides direction for monitoring and assessing forest and rangeland health.
- Develop a process for monitoring the need for maintenance of treated areas, over time, in order to preserve the forest health benefits achieved.
- Strengthen public participation and provided incentives for local communities to develop community protection plans.
- Instructs the Courts when considering legal challenges to halt projects, to balance the short-term effects of implementing the projects against the harm from undue delay and long-term benefits of a restored forest.
- Encourages biomass removal from public and private lands.
- Provides technical, educational, and financial assistance to improve water quality and address watershed issues on non-Federal lands.
- Authorizes large-scale silvicultural research.
- Authorizes acquisition of Healthy Forest Reserves on private land to promote recovery of threatened and endangered species, and improve biodiversity and carbon sequestration.
- Directs the establishment of monitoring and early warning systems for insect or disease outbreaks.

National Fire Plan (2001)

In August 2000, the President directed the Secretaries of Agriculture and Interior to develop a response to severe wildland fires, reduce fire impacts on rural communities, and assure sufficient firefighting capacity in the future. In 2001, The National Fire Plan was developed to safeguard rural and urban interface communities and to help return vigor and resilience to forest, rangeland, and aquatic ecosystems. The Plan encompasses the Departments of Agriculture (Forest Service) and Interior (National Park Service, Fish and Wildlife Service, and the Bureau of Land Management) and is a is a long-term, cohesive strategy founded on interagency and intergovernmental partnerships and cooperation to enhance the wildland firefighting response, reduce the threat of fire to communities and natural resources, restore and rehabilitate lands damaged by fire and most importantly, increase the safety of the public and firefighters.

10-Year Comprehensive Strategy (2001)

The fires of 2000 focused national attention on the threats wildland fire posed to people, communities, and natural resources. All levels of government responded and, in concert with a wide spectrum of non-governmental interests, joined forces to develop a comprehensive nationwide approach to lessen the impacts of unwanted fires.
A major component of that overall effort emerged in August 2001 with the approval of "A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-Year Strategy," (10-Year Strategy) by the Western Governors' Association (WGA), the Secretaries of the Departments of Agriculture and the Interior, and many others including southern Governors, counties, and tribes.

The 10-Year Strategy generally supports the goals of the National Fire Plan, with utilization of the following objectives during the plan development:

- Reduce risk to communities and the environment from wildland fires for the long-term.
- Promote a collaborative, community-based approach to address wildland fire issues that recognizes the importance of making key decisions at the local level.
- Support the primary goals of the National Fire Plan: improve prevention and suppression, reduce hazardous fuels, restore fire-adapted ecosystems, and promote community assistance.
- Hold the core guiding principles of collaboration, priority setting, and accountability.

The Governors, Secretaries, and their partners subsequently approved the Implementation Plan for the 10-Year Strategy in May 2002. Both documents benefited from the contributions of numerous non-governmental partners.

Federal Emergency Management Agency Disaster Mitigation Act (2000)

The Disaster Mitigation Act 2000 (Public Law 106-390) provides the legal basis for Federal Emergency Management Agency (FEMA) mitigation planning requirements for State, local and Indian Tribal governments as a condition of mitigation grant assistance. The Disaster Mitigation Act 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act by repealing the previous mitigation planning provisions and replacing them with a new set of requirements that emphasize the need for State, local, and Indian Tribal entities to closely coordinate mitigation planning and implementation efforts. The requirement for a State mitigation plan is continued as a condition of disaster assistance, adding incentives for increased coordination and integration of mitigation activities at the State level through the establishment of requirements for two different levels of state plans.

The Disaster Mitigation Act 2000 also specifies criteria for hazard mitigation planning, which require local and Indian tribal governments applying for Pre-Disaster Mitigation funds to have an approved local mitigation plan. These may include county-wide or multi-jurisdictional plans as long as all jurisdictions adopt the plan. Activities eligible for funding include management costs, information dissemination, and planning, technical assistance and mitigation projects. *FEMA Pre-Disaster Hazard Mitigation Program* Establishes a National Pre-Disaster Mitigation Fund for a 3-year period

- Governors may recommend 5 or more local communities annually for assistance funds are provided for technical assistance to communities
- "Small impoverished communities" may receive increased federal shares Federal Emergency Management Agency (FEMA) to establish an interagency task force to coordinate Federal pre-disaster mitigation FEMA Mitigation Planning
- Requires local and Tribal governments to develop and submit mitigation plans
- Allows 7% of Hazard Mitigation Grant Program (HMGP) funds for planning purposes
- Increases Hazard Mitigation Grant Program from 15% to 20% for states meeting enhanced planning criteria

SECTION TWO – THE PLANNING PROCESS

The Newaygo County Emergency Services Department in conjunction with the Newaygo County Local Emergency Planning Team have developed the Community Wildfire Protection Plan to identify and address issues related to wildfire hazard analysis, hazard vulnerabilities, and hazard mitigation within Newaygo County. Newaygo County Emergency Services performed the following actions to develop the plan.

Step One: Convene Decision Makers

The initial step in developing a Community Wildfire Protection Plan should be formation of an operating group with representation from local government, local fire authorities, and the state agency responsible for forest management. Together, these three entities form the core decision-making team responsible for the development of a Community Wildfire Protection Plan as described in the Healthy Forests Restoration Act. The core team members must mutually agree on the plan's final contents. In communities where several local governments and fire departments are within the planning area, each level of government/authority may need to convene ahead of time and identify a single representative to participate, on its behalf, as a core team member.

Newaygo County Emergency Services established a workgroup within the Newaygo County Local Emergency Planning Team to assist in the development of a Community Wildfire Protection Plan. The Local Emergency Planning Team Community Wildfire Protection Plan Workgroup includes representatives from the following agencies:

1. Newaygo County Emergency Services Department
2. Local Government Representative
3. Newaygo County Fire Chiefs Association
4. Station 12, Newaygo Fire Department
5. Station 14, Croton Fire Department
6. Station 15, Big Prairie Fire Department
7. Station 17, Lilley Fire Department
8. Station 18, White Cloud Fire Department
9. USDA Forest Service, Huron Manistee National Forest, Baldwin Office
10. Michigan Department of Natural Resources and Environment
11. Michigan State University Extension Office, Newaygo County

This Community Wildfire Protection Plan Workgroup met on the following dates to develop the plan:

May 29, 2009

June 10, 2009

July 28, 2009

March 23, 2010

June 22, 2010

July 20, 2010

July 28, 2010

September 29, 2010

October 21, 2010

Step Two: Involve Federal Agencies

Once convened, members of the core team should engage local representatives of the United States Forest Services and Bureau of Land Management to begin sharing perspectives, priorities, and other information relevant to the planning process.
Because of their on-the-ground experience, mapping capabilities, and knowledge of natural resource planning, these local land management professionals will be key partners for the core team. In some landscapes, they will also be largely responsible for implementing the priorities established in the resulting Community Wildfire Protection Plan.

Sixty-one percent of Newaygo County's 537 thousand acres of land is forested (MSU Extension 2006). Of this, 62% is in private ownership; almost all owned by small, non-industrial owners and 38% is in public ownership, the vast majority is part of the Huron Manistee National Forest managed by the US Forest Service. There are no Bureau of Indian Affairs lands or any other Federal ownership in Newaygo County. Due to Newaygo County's close relationship with the National Forest Service, representatives from the Baldwin Office were involved with the Community Wildfire Protection Planning Process from the beginning.

Step Three: Engage Interested Parties

The success of a Community Wildfire Protection Plan also hinges on the ability of the core team to effectively involve a broad range of local stakeholders, particularly when the landscape includes active and organized neighborhood associations, community forestry organizations that work in forest management, and other stakeholder groups that display a

commitment to fire protection and fuels management. Substantive input from a diversity of interests will ensure that the final document reflects the highest priorities of the community. It will also help to facilitate timely implementation of recommended projects. In some circumstances, the core team may wish to invite local community leaders or stakeholder representatives to work along with them in final decision making.

As early as possible, core team members should contact and seek active involvement from key stakeholders and constituencies such as:

- Existing collaborative forest management groups
- City Council members
- Resource Advisory Committees
- Homeowners Associations—particularly those
- representing subdivisions in the WUI
- Division of Wildlife/Fish and Game—to identify
- locally significant habitats
- Department of Transportation—to identify key escape corridors
- Local and/or state emergency management agencies
- Water districts—to identify key water infrastructure
- Utilities
- Recreation organizations
- Environmental organizations
- Forest products interests
- Local Chambers of Commerce
- Watershed councils
- Etc.

In addition to directly contacting key individuals and organizations, core team members may want to consider using a public notice or public meeting process to acquire additional, more generalized input as the plan is developed.

The Newaygo County Local Emergency Planning Team, which has representatives from local government, public safety, private business, and public organizations, was directly involved with the over site of the Community Wildfire Protection Planning Process and the review of the final draft plan before it was presented to the Newaygo County Board of Commissioners and Newaygo County Fire Chiefs Association for adoption. In addition, the Newaygo County Fire Chiefs Association provided data for the Wildfire Hazard Analysis and History of Fire Occurrence Map. Finally, the Newaygo County Board of Commissioners Public Safety Committee received regular updates on the planning process. All three organizations were provided the opportunity to be involved in the planning process and provide input.

The on following dates, the Community Wildfire Protection Planning Workgroup presented information on the planning process to the Newaygo County Fire Chiefs Association:

July 14, 2009
August 12, 2009 – Newaygo County Board of Commissioners
September 8, 2009
November 10, 2009
January 12, 2009
July 13, 2010
November 9, 2010
November 10, 2010 – Newaygo County Board of Commissioners

Step Four: Establish a Community Base Map

Using available technology and local expertise, the core team and key partners should develop a base map of the community and adjacent landscapes of interest. This map will provide a visual information baseline from which community members can assess and make recommendations regarding protection and risk-reduction priorities. To the extent practicable, the map should identify:

- Inhabited areas at potential risk to wildland fire;
- Areas containing critical human infrastructure—such as escape routes, municipal water supply structures, and major power or communication lines—that are at risk from fire disturbance events; and
- A preliminary designation of the community's WUI zone.

The Newaygo County Community Wildfire Protection Plan utilized the base map from the Newaygo County Hazard Management Plan, which combines the Newaygo County Hazard Analysis with the Newaygo County Hazard Mitigation Plan. The base map was developed by West Michigan Shoreline Regional Development Commission, the planning commission contacted to complete the Newaygo County Hazard Analysis, in 2005. The Newaygo County Hazard Management Plan was approved by FEMA in 2006 under the requirements of the FEMA Disaster Mitigation Act of 2000.

Step Five: Develop a Community Risk Assessment

The development of a community risk assessment will help the core team and community members more effectively prioritize areas for treatment and identify the highest priority uses for available financial and human resources. A meaningful community assessment can be developed by considering the risk factors identified below. Choose an appropriate adjective rating (such as high, medium, and low) that best represents the risk to the community posed by each factor. Display the results on the base map to develop a useful tool for the final

decision-making process. State and federal land managers will be a valuable resource in helping communities locate the best available data and in producing quality maps that display and aid assessment of that data. Engaging key stakeholders in the rating process will be essential to a successful outcome.

A. Fuel Hazards

To the extent practicable, evaluate the vegetative fuels on federal and nonfederal land within or near the community. Identify specific areas where the condition of vegetative fuels is such that, if ignited, they would pose a significant threat to the community or essential community infrastructure. Consider how the local topography (such as slope, aspect, and elevation) may affect potential fire behavior.

Identify areas affected by wind throw, ice storms, or insect and disease epidemics where fuels treatment would reduce wildfire risks to communities and/or their essential infrastructure.

State and federal resource planning documents can be a valuable source of information on local forest and rangeland conditions. Rate each area of identified hazardous fuels and show each on the base map as a high, medium, or low threat to the community.

B. Risk of Wildfire Occurrence

Using historical data and local knowledge, determine the common causes and relative frequency of wildfires in the vicinity of the community. Consider the range of factors, including critical weather patterns that may contribute to the probability of fire ignitions and/or extreme fire behavior. Use relative ratings such as high, medium, and low to show areas of concern for fire starts on the base map.

C. Homes, Businesses, and Essential Infrastructure at Risk

Assess the vulnerability of structures within the community to ignition from firebrands, radiation, and convection. Document areas of concern. Identify specific human improvements within or adjacent to the community, such as homes, businesses, and essential infrastructure (e.g., escape routes, municipal water supply structures, and major power and communication lines) that would be adversely impacted by wildfire.

Categorize all identified areas needing protection using ratings of high, medium, or low, and show them on the base map.

D. Other Community Values at Risk

At the community's option, the risk assessment may also consider other areas of community importance, such as critical wildlife habitat; significant recreation and scenic areas; and landscapes of historical, economic, or cultural value that would benefit from treatment to reduce wildfire risks. Additional recommendations from local stakeholders should be

incorporated as appropriate. Categorize all identified areas that warrant protection using the ratings of high, medium, or low, and show them on the base map.

E. Local Preparedness and Firefighting Capability

Assess the level of the community's emergency preparedness, including evacuation planning, safety zones, and fire assistance agreements, as well as the response capability of community and cooperator fire protection forces. Consider the insurance industry ISO rating, if available and applicable. Use the knowledge and experience of local officials to identify areas in need of improvement. Incorporate local preparedness information into the base map as appropriate.

When developing the community risk assessment, the Community Wildfire Protection Planning Workgroup utilized 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.

The RAMS model was developed as a comprehensive fire planning approach for fire managers to analyze six primary risk/hazard rating factors contributing to the overall risk of catastrophic fire. The six factors are:

1. Fire related fuels hazard
2. Resources and economic assets at risk
3. Wildland ignition risk
4. Wildland fire history
5. Catastrophic fire potential
6. Fire protection capability.

The RAMS model considers the effects of fire on unit ecosystems and communities, by taking a coordinated landscape level planning approach. This approach facilitates development of appropriate mitigation and hazardous fuels treatments programs. The objective of the model is to identify wildfire risk and hazard, especially to communities, by analyzing fuel and topographic hazards, wildfire suppression complexity and capability, and community values. It is also an objective to direct resources, including fire suppression and fuel management resources, based on the wildfire risk.

The steps involved in this assessment process include:

- Identify risk assessment and hazard mitigation objectives

- Divide the County into smaller units of analysis (fire planning compartments) to be used in the RAMS model
- Assess the fire environment
- Determine the relative wildfire risk/hazard rating for each fire planning compartment.

The RAMS model subdivides Newaygo County into two “planning compartments”, north and south. The planning compartments were then broken down into twenty-four 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.

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

Once the community assessment and base map are completed, the core team should convene all interested parties to discuss the results and their implications for local protection and hazard mitigation needs. A key objective of these discussions is to develop the community’s prioritized recommendations for fuel treatment projects on federal and nonfederal lands in the Wildland Urban-Interface, along with the preferred treatment methods for those projects. Recommendations should also be developed regarding actions that individuals and the community can take to reduce the ignitability of homes and other structures in the community’s Wildland Urban Interface zone. While local interests are gathered, communities may also want to take this opportunity to identify and develop strategies to improve their emergency preparedness and fire response capability. The discussion and identification of community priorities should be as open and collaborative as possible. Diverse community involvement at this stage is critical to the ultimate success of the Community Wildfire Protection Plan.

Recommendations included in the final Community Wildfire Protection Plan should clearly indicate whether priority projects primarily serve to protect the community and its essential infrastructure or are geared toward reducing risks to the other community values. Under the provisions of the Healthy Forest Restoration Act of 2003, only projects that primarily serve to protect communities and essential infrastructure are eligible for the minimum 50 percent Wildland Urban Interface funding specified in the legislation.

As determined by the Community Wildfire Protection Planning Workgroup, the following priorities were utilized in determining ranking recommendations for fuel treatment projects:

1. The potential for loss of life (life safety of the community and first responders)
2. The potential for loss of structure (values of properties at risk)
3. The potential for rapid growth of the wildfire (fuels, limited access, difficult terrain, or a non-accessible / non-workable area)

Based on the priorities listed above, areas of concern were identified within each of the Wildland Urban Interface areas (WUI). Initial physical site assessments have been conducted by an interagency field assessment team in each of the areas of concern to identify recommendations for fuel treatment projects, creating defendable spaces around homes and critical infrastructure, or another applicable wildfire mitigation strategy. The wildfire mitigation strategies for the areas of concern were then prioritized by utilizing the collective input and knowledge of the Community Wildfire Protection Plan Workgroup based upon the available resources, community involvement, and local leadership.

Step Seven: Develop an Action Plan and Assessment Strategy

Before finalizing the Community Wildfire Protection Plan, core team members and key community partners should consider developing an action plan that identifies roles and responsibilities, funding needs, and timetables for carrying out the highest priority projects. Additional consideration should be given to establishing an assessment strategy for the Community Wildfire Protection Plan to ensure that the document maintains its relevance and effectiveness over the long term.

The Newaygo County Community Wildfire Protection Plan Workgroup will assign an interagency field assessment team in each of the areas of concern to finalize recommendations for fuel treatment projects, creating defendable spaces around homes and critical infrastructure, or another applicable wildfire mitigation strategy. The data collected by the field assessment team will then be entered into the Risk Assessment and Mitigation Strategies (RAMS) under the FUELS section to document, track, and monitor wildfire mitigation projects in Wildland Urban Interface areas (WUI). Projects will be prioritized based on available resources, community involvement, and local leadership.

Step Eight: Finalize the Community Wildfire Protection Plan

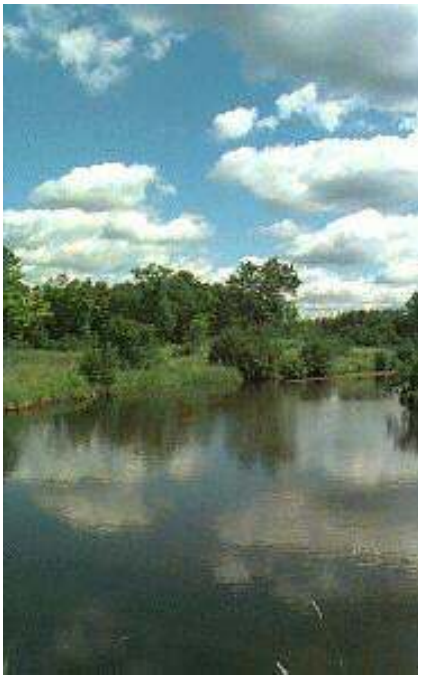
The final step in developing a Community Wildfire Protection Plan is for the core team to reconvene and mutually agree on the fuels treatment priorities, preferred methods for fuels treatment projects, the location of the wildland-urban interface, structural ignitability recommendations, and other information and actions to be contained in the final document.

The Newaygo County Community Wildfire Protection Plan Workgroup will identify treatment areas and priorities in and around the Wildland Urban Interface areas (WUI) as described by the Community Wildfire Protection Plan. The Wildfire Protection Plan Workgroup will communicate and coordinate with partners and local officials on accomplishing wildfire mitigation projects. The Newaygo County Community Wildfire Protection Plan Workgroup will review and update the Community Wildfire Protection Plan on an annual basis or as needed.

SECTION THREE – COMMUNITY PROFILE

Newaygo County

Named after Chippewa Indian Chief Naw-wa-goo, who was a signer on the treaty of Saginaw in 1812, Newaygo County is located "in the heart of the Muskegon River Valley" in the west central part of Michigan's Lower Peninsula. Newaygo County is composed largely of rural residential and national forest and is traversed by M-20, M-37, and M-82. According to the U.S. Census Bureau, the county has a total area of 861 square miles and is the 36th largest in the state. The county seat is located in White Cloud. With 234 natural lakes and 356 miles or rivers and streams, Newaygo County relies on tourism as its main economic support, with agriculture and small manufacturing secondary. The Muskegon River continues to be the main attraction for summer cottage residents and fishermen, who find it nearly the best source anywhere in Michigan for steelhead in the spring and salmon in the fall. Newaygo County offers many opportunities for hunting, fishing, camping, canoeing, and boasts an impressive recreational trail system contained within the Manistee National Forest.



Historical Overview

Establishment and Early Growth

Settlement of the area began in 1836 when Michel Charleau, a French Fur Trader, took a group of Chicago businessmen interested in land and timber up the Muskegon River. When they reached the banks of what is now known as the City of Newaygo, the party observed the great expanse of white pines. Determining the area would provide a good business opportunity, they established claims on the junction of the Muskegon River and the mouth of a creek which they named Pennoyer Creek. Soon plans were developed for the first saw mill on Pennoyer Creek, thus launching the first permanent settlement in the County. On September 1, 1837, Pennoyer Mill was complete and began operation, floating lumber to Muskegon on rafts then shipping the lumber to Chicago. The lumber boom soon followed in the late 1800's, significantly impacting the physical and cultural landscape of Newaygo. Its location on the Muskegon River upstream from Muskegon, a major lumber town at the time, along with its proximity to vast amounts of timber, encouraged settlement of the area and ultimately put the county on the map.

The boundaries for Newaygo County were set in 1840, but being unorganized, it was attached to Kent County to the south. Newaygo County became a separate County and formally organized in 1851. During the first elections in 1851 the Probate Court, Sheriff, and Clerk's Offices were established. Jacob Barnhard was the first judge of probate court, James Berry was the first Sheriff, and Loyal Palmer was the first Clerk. During the 1855 elections the Treasurer, Prosecuting Attorney, and Surveyor's Offices were established. John Swartout was the first Treasurer, Edgar Gray was the first Prosecuting Attorney, and William Utley was the first Surveyor. The Drain Commissioners office was established in 1869 and the Judge of Circuit Court was established in 1876. Charles Carmichael was the first drain commissioner and Michael Brown was the first Judge of Circuit Court. The first marriage records were filed in the clerk's office in 1851, and the first birth and death records were filed in 1867.

Newaygo was the first County Seat and a brick courthouse was built in 1886. There are many legends and stories concerning the name chosen for the County. It is believed that the name was derived from an Ottawa Indian brave, Nah-way-go, who had a reputation for bravery and strength and was known for his courage on the battlefield. He was seen and admired by the area's first white settlers.

As the settlements grew, roads were constructed and in 1849, the first state road was built from Croton and Newaygo to Muskegon. In 1854, a state road was built from Newaygo to Grand Rapids and facilitated the construction of the Big Red Mill at Newaygo. The Grand Rapids, Newaygo, and Lake Shore Rail Road came to Newaygo in 1872, connecting the city with Grand Rapids. In 1875 the rail road was extended to White Cloud.

Settlement and growth came late to the future County Seat, White Cloud. Prior to 1870, there was no real growth. However, construction of the railroad in 1875 spurred new growth. When lumberman Wilcox and Morgan came to the area, there was already a settlement there, Alleyton, started by Mr. Alleyton. Wilcox and Morgan started a second settlement across the river called Morgan Station. In 1872, lumbering operations started on the White River and fast growth came to the area. At the request of the postal officials, Morgan Station was renamed White Cloud and in 1872, the Village was incorporated. Both settlements continued to grown and by 1882, they had 136 school age children. Alleyton grew larger and faster and was considered the more elegant of the two. By 1880, it had 550 residents, and 32 businesses.

Fire was extremely detrimental to early settlements in Newaygo County. In 1883 a massive fire destroyed the City of Newaygo, leaving only two buildings standing. Soon there after, White Cloud became the County seat. On July 4, 1894, after already suffering from one fire, another struck, wiping out the Village of White Cloud. It was never rebuilt, and little remains to indicate its former existence.

When the lumbering era began in the early 1800's in Michigan, it was expected to last hundreds of years. However, within approximately fifty years, the vast softwood timber resources in the Lower Peninsula, including those in Newaygo County were harvested and the slash burned over more than once. Some believe that more logs were floated down the Muskegon River than any other river in the world. It is estimated that only one out of every three trees were actually harvested, the rest having been destroyed by forest fires. The forests and the soils were forever changed as a result of clear cutting, forest fires and farming.

By the early 1890's, with the vast timber resources depleted, lumbering moved out of the area. By the last quarter of the 19th century, some of the easier to drain wetlands were converted to farmland. In the early 20th century, Rice Lake in Grant Township was drained and its lakebed is now used for specialty crops. As the logging industry slowed and farming increased, a canning factory established in Fremont to market the produce, grew into a major enterprise known today as Gerber Products.

With the lumbering era over, other industries began to replace the economic focus of the area. In 1898, the marl beds just north of Newaygo were acquired by D.L. Stivens of Newaygo Manufacturing Company and a group of Grand Rapids businessmen and a cement company was formed. By 1902, the first barrels were shipped.

Not all of the land that was originally settled was suitable for farming and many farms were later abandoned. Much of this land reverted to the Federal Government and today is managed as part of the Manistee National Forest. Today, the United States Forest Service owns approximately 108,000 acres or almost 20% of the County. Other farmland was purchased for recreational uses. Forest products from the second growth forests and recreation are the chief resources of the northern two-thirds of the County. In the southern third of the County, farming and industry has evolved. With some of the largest muck farms located in the eastern half of the County, Grant is known as the onion capital of the world. There are also significant apple and peach orchards. The County's two hydroelectric dams on the Muskegon River produce enough kilowatts of electricity to power a city of 23,000 people. Both Croton Dam and Hardy Dam are on the National Register of Historic Places. Croton was constructed in 1906-07 and was the first hydro facility in the nation to use 110,000 volt transmission lines. Hardy went into service in 1931 and at the time was the tallest earthen dam in the world. Today it is still Michigan's tallest earthen dam and provides a 3,800 acre reservoir that is enormously popular for outdoor recreation. Newaygo County's three largest cities incorporate all these major uses. The City of Newaygo is known for its angling opportunities for chinook salmon, steelhead and brown trout, as well as boating, canoeing and kayaking. Fremont is the home of the world's leader in baby food, Gerber Products. White Cloud, with its motto emphasizing its recreation activities, "Where the North Begins and the Pure Water Flow" is the County Seat.

Notable Citizens and Events

Daniel Gerber (1873 - 1952) and Gerber Products

Gerber traces its origins to the Fremont Canning Company, a small packager of peas, beans, and fruits in rural Michigan begun by Frank Gerber and his father in 1901. At that time, Gerber also served as a partner in his father's tannery. When the tannery closed in 1905, Gerber focused all his efforts on building the canning company. By 1914 he had expanded his plant to permit year-round production. Three years later, with the death of his father, Gerber became president of the company and saw its sales exceed $1 million for the first time. Following a brief postwar dip in profits, Fremont Canning experienced steady growth during the 1920s.

In 1927, Mrs. Gerber began hand-straining solid food for her seven-month-old daughter and suggested the work could be easily done at the Fremont Canning Company, where the Gerber family produced a line of canned fruits and vegetables. Experiments with strained baby foods began shortly thereafter, and Sally Gerber became the company's first baby food analyst. Soon workers in the plant requested samples for their babies. By late 1928, strained peas, prunes, carrots and spinach, not to mention beef vegetable soup, were ready for the national market.

At that time, national distribution was nearly unheard of, meaning that the foods would only be available in a few stores in every area of the country. To compensate, the Gerber's launched an advertising campaign featuring a coupon and the now-famous Gerber Baby. The ads appeared in publications from The Journal of the American Medical Association to Good Housekeeping. Grocers who had been skeptical were now placing orders by the dozen. Within six months, Gerber Baby Foods were on grocery store shelves across the nation.

In 1952, The Gerber Foundation was established and provided $14,700 in support to various organizations that first year, including organizations such as the American Red Cross, Americas Future, 4-H Clubs, Boys and Girls Clubs, the United Negro College Fund, and the National Fire Protection Association, among others. Small grants were also awarded to various community agencies within those communities where Gerber Products Company had a presence. Since the Foundation has provided millions of dollars to enhance the quality of life of infants and young children in nutrition, care, and development, remains

as the guiding beacon for Foundation giving. Beginning in 1953, scholarships were provided to a wide variety of institutions across the United States as well as to dependents of Gerber Products Company Associates.

In addition to the Gerber Foundation, the Gerber Life Insurance Company was formed as a subsidiary of Gerber Products Company in 1967. It is one of the top direct-response marketing insurance companies and a leading producer of juvenile life insurance. As of today, Gerber Life Insurance Company has more than $9 billion of life insurance in force and insures more than 2 million people throughout the United States and Puerto Rico.

By 1973, Gerber was the world's largest supplier of baby foods with sales of $278 billion. Gerber also added non-baby food products to the company's line including lotions, vaporizers, toys, and Gerber Baby ware, an extensive line of shirts, socks, crib sheets, and other baby gear. Daniel Gerber is now listed as one of the Twentieth Century Great American Business Leaders.

Croton Dam

The Croton Hydroelectric Generating Dam has been in continuous operation since 1907. It is capable of generating 8,800 kilowatts of electricity, enough to serve a community of about 4,900 people. The plant is located in Newaygo County's Croton Township and is the site of the great salmon migration.

Hardy Dam

The Hardy Hydroelectric Generating Dam is the third largest earthen-filled dam in the world whose backwaters form Michigan's largest inland lake with over 50 miles of shoreline. The dam began operation in 1931. It is capable of generating 30,000 kilowatts of electricity, enough to serve a community of 16,600 people. Hardy Dam is located in Newaygo County's Big Prairie Township and is the largest earthen dam east of the Mississippi.

Geography and Climate

Location, Communities, and Proximity to Surrounding Cities

Newaygo County is located in the west central region of Michigan's Lower Peninsula. The City of White Cloud, located in the center of Newaygo County, which is the county seat and the third largest city in Newaygo County with a population of 1,420. The other three Cities includes Fremont, located in the south-west area of the county with the largest population of 4,224, Newaygo, located south-central along the Muskegon River, with the second largest population of 1,670, and Grant, located in the southern most point of the county, with the smallest population of 881. Fremont, White Cloud, Newaygo, and Grant serve many of the needs of the county residents, however, the City of Grand Rapids (population 197,800) located approximately twenty five miles from the county's southern border, Big Rapids (population 10,849) located ten miles from the county's east boarder, and Muskegon (population 40,105), located approximately fifteen miles from the county's southwestern border, also serve as core communities.

The City of Fremont is located along M-82 with the south half of the city located in Sheridan Township and the north half of the city located in Dayton Township, all which lie in the south west portion of Newaygo County. Known as the Baby Food Capital of the World, the city of Fremont has a rich history. Fremont was first settled and became a township in 1855. By the mid-1870s, the Gerber family moved to the area and opened a tannery. The city's history and economic growth have been intertwined with the family ever since. By the 1920s, the Gerbers founded a baby food company using the area's rich agricultural resources. Due to the presence of Gerber Foods and the proven demand for its products, Fremont experienced gradual, controlled growth throughout the 20th Century. Due to this progressive growth, the city has been able to provide and maintain public services when and where they were necessary. Major employers in Fremont include:

- DURA Automotive Systems, 502 Connie Avenue (535 employees)
- Gerber Products, 445 State St (1450 employees/Bank, Plant-690, Administration)
- Gerber Memorial Health Services, 1323 W Main Street (470 employees)

- Fremont Public Schools, 222 W Pine (333 employees)
- Wal-Mart Stores, Inc., 7083 W 48th, (360 employees)
- Gerber Life Insurance, 206 W Main (115 employees)
- Pine Medical Group, 230 W Oak (79 employees)
- Hi-Lites Graphics Inc, 1212 Locust (42 employees)

The City of Newaygo is located at the junction of M-37 and M-82 with the east half of the city located in Brooks Township and the west half of the city located in Garfield Township, all which lie in the south-central portion of Newaygo County along the Muskegon River. The City of Newaygo is the oldest community in the County. The Penoyer and Brooks families were among the first settlers to Newaygo. They founded Newaygo's first saw mill known as the "Big Red Mill". The rail service came through Newaygo in 1873, connecting with metropolitan Grand Rapids, Chicago, and Detroit. In 1883 a massive fire destroyed Newaygo, leaving only two buildings standing. The architectural influence existing today is of the late Victorian style. The proximity of the Muskegon River was the driving force of Newaygo's early economy, with mills, lumbering, and recreation developing near by. Although not as populated or geographically large as Fremont, this area has seen steady growth in recent years due to easy access and close proximity to Grand Rapids in addition to hosting several of the County's largest employers including:

- Magna Donnelly Corporation, 700 S Park Drive (476 employees)
- Newaygo Community Education, 360 S Mill (251 employees)
- Plumb's Super Market Incorporated, corner of M-82 & M-37 (52 employees)
- SandMold Systems, 313 West State St (49 employees)
- G&M Wood Products, 531 Clay St (46 employees)
- Monarch Hydraulics, 201 Cooperative Center Drive (43 employees)
- Armstrong Display Concepts, 480 S. Park (20 employees)

The City of White Cloud is located at the junction of M-37 and M-20 with the south half of the city located in Everett Township and the north half located in Wilcox Township, which is in the center of Newaygo County. White Cloud is the community seat and hosts all county government offices including County Administration, Central Dispatch, the Sheriff Department, Jail, Community Mental Health, Department of Human Services, and Emergency Services. Major employers include:

- White Cloud Public Schools (186 employees)

- Newaygo County DHS, (45 employees)

- LubeCon Systems, Inc, 201 N. Webster (30 employees)

The City of Grant is the smallest city in Newaygo County and home to one of the few remaining wooden water towers in the State of Michigan, Grant is located on M-37 in Newaygo County's southern townships of Ashland and Grant. The City is located on a major Michigan Highway that acts as a popular direct route for travel between Grand Rapids and Traverse City. Many of our residents commute to Grand Rapids, Muskegon, and Fremont for employment, although locally-owned Grant Rent-All has recently opened a new manufacturing facility, and has announced plans to create 17 manufacturing jobs. Additionally, Family Health Care has built a new healthcare facility on the corner of M-37 and State Street to service the Grant Community and bring prominent healthcare professionals to the area. Not to mention, with some of the largest muck farms located in the eastern half of the County, Grant is known as the onion capital of the world. There are also significant apple and peach orchards around the area. Major Employers in the area include:

- Grant Public Schools (297 employees)

- Gene's Family Market, 33 East State St (75 employees)

- Grant Tower, Inc, 13064 Wisner SW (30 employees)

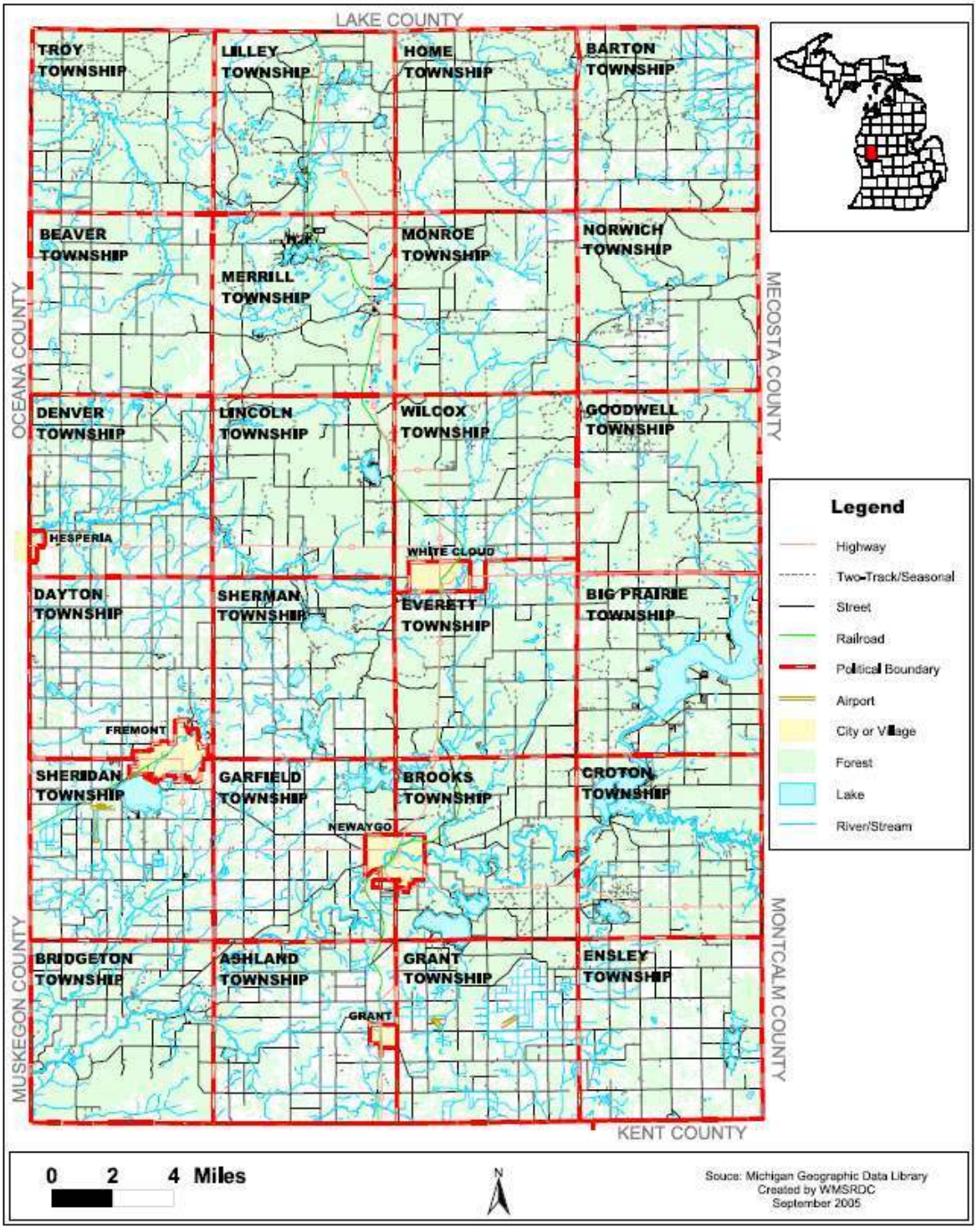
The Village of Hesperia is located in Newaygo County's western township of Denver and extends into Oceana County. Hesperia is the only village in Newaygo County. Situated on the White River along M-20, Hesperia was named from Hesperides in Greek Mythology, meaning blissful garden located in the western part of Greece. In 1856 Booth Perry settled the area followed shortly there after by Pat McFarland and Alex McLaren. The village of Hesperia was platted in 1866 and became a village in 1883. Major employers in Hesperia include:

- Hesperia Community Schools (164 employees)

- Ed's Thrift-T Shopping Center, 75 W Michigan (61 employees, Oceana County)

MAP 1

NEWAYGO COUNTY
Base Map



Distance to Major Cities

A number of regional and larger cities are well within driving distance from the county:

Muskegon	15 miles
Grand Rapids	25 miles
Traverse City	75 miles
Lansing	110 miles
Detroit	190 miles
Chicago	220 miles
Indianapolis	280 miles
Cleveland	310 miles

Climate and Weather Patterns

The climate of Newaygo County is highly varied due to topographical variations and the proximity of the county to Lake Michigan. The climatologically records of the county are not considered the most reliable because the report gives data that are from weather stations that are not located in the county. Those stations which data was pulled from is located in Grand Rapids and Muskegon. Table 1 through Table 5 provide a monthly overview of the county's weather patterns based on climate data from the National Weather Service in Grand Rapids for 2003 through 2009 with combined averages taken from both data sets (Grand Rapids and Muskegon). Newaygo County occasionally receives major winter storms and is often affected by Lake Effect Snow from Lake Michigan. Prevailing winds are normally from the southwest. January is normally the county's coldest month and July is normally the warmest. May usually has the highest level of precipitation and February normally has the least. Snow depth within the county is normally greatest in January.

Overall, the climate of Newaygo County provides a four season location for winter, spring, summer and fall activities. Snowfall is often sufficient for extensive winter activities including cross country skiing, snowmobiling, sledding, tobogganing and snow shoeing. Winter temperatures are sufficiently cold to provide safe ice for ice fishing and ice skating. During spring, Newaygo County's climate provides ample opportunities for many types of outdoor recreation including mushroom picking, open water fishing, turkey hunting, 9 wildlife viewing, boating, non-motorized trail use (e.g. hiking, bicycling, equestrian, etc.), off-road vehicle use and camping. In the summer, Newaygo County's lakes and rivers are critical recreation resources. County parks on Hardy Pond, the Muskegon River and Pettibone

Lake provide welcome breaks from the heat for campers, swimmers, anglers, boaters and those just seeking the cool blue of inland waters. With over 300 lakes and hundreds of miles of rivers and streams, there are water based recreation opportunities for almost every taste. During fall, the mixture of Newaygo county's softwood (pine, fir, cedar) forests and hardwoods (oak, maple, aspen, etc.) provide a tremendous spectacle of color for sightseers. Other outdoor recreation opportunities such as trail use, hunting, fishing, wildlife viewing, camping and boating are available.

Table 1: Record Monthly Temperatures in Degrees Fahrenheit

Source: Weather Underground Weather Station in Fremont, Michigan

Month	Record High	Date	Record Low	Date
January	63°F	Jan. 25, 1950	-16°F	Jan. 3, 1918
February	67°F	Feb. 11, 1999	-30°F	Feb. 11, 1899
March	80°F	March 31, 1981	-11°F	March 16, 1945
April	86°F	April 29, 1970	1°F	April 7, 1982
May	93°F	May 29, 1962	22°F	May 10, 1947
June	98°F	June 20, 1995	31°F	June 11, 1972
July	99°F	July 30, 1913	39°F	July 2, 2001
August	99°F	Aug 3, 1964	36°F	Aug 16, 1979
September	95°F	Sept 1, 1953 Sept 6, 1954	27°F	Sept 27 , 1989
October	86°F	Oct 15, 1899	19°F	Oct 29, 1905
November	76°F	Nov 2, 1961 Nov 20, 1930	-14°F	Nov 25, 1950
December	64°F	Dec 2, 1982	-15°F	Dec 31, 1976

Table 2: Average Daily High in Degrees Fahrenheit

Source: National Weather Service

MONTH	2003	2004	2005	2006	2007	2008	2009	Total Average
January	27	27	29	39	34	32	24	**30°F**
February	28	34	35	33	25	30	33	**31°F**
March	42	46	39	45	49	40	43	**43°F**
April	56	60	62	61	54	61	55	**58°F**
May	65	68	64	67	73	66	67	**67°F**
June	76	73	83	77	81	77	75	**77°F**
July	80	79	82	84	82	66	75	**78°F**
August	82	75	81	81	81	81	75	**79°F**
September	72	77	77	69	77	74	73	**74°F**
October	59	60	62	56	66	60	53	**59°F**
November	48	47	49	48	46	46	50	**48°F**
December	38	35	30	41	35	33	32	**35°F**

Table 3: Average Daily Low in Degrees Fahrenheit

Source: National Weather Service

MONTH	2003	2004	2005	2006	2007	2008	2009	Total Average
January	15	14	19	29	23	21	9	**19°F**
February	14	18	23	20	14	15	20	**18°F**
March	24	32	20	28	30	25	27	**27°F**
April	35	38	38	39	36	38	36	**37°F**
May	45	49	44	48	50	43	47	**47°F**
June	53	56	63	56	58	58	56	**57°F**
July	60	60	62	64	61	62	54	**60°F**
August	62	56	61	61	63	59	58	**60°F**
September	51	53	55	51	54	55	52	**53°F**
October	40	43	43	39	49	40	40	**42°F**
November	35	34	33	34	32	33	36	**34°F**
December	26	22	23	30	25	21	23	**24°F**

Table 4: Average Monthly Precipitation in Inches

Source: National Weather Service

MONTH	2003	2004	2005	2006	2007	2008	2009	Total Average
January	0.06	0.09	0.27	0.27	0.62	0.16	0.07	**0.22**
February	0.04	0.09	0.16	0.21	1.66	0.19	0.07	**0.35**
March	0.1	0.28	0.13	0.35	0.14	0.11	0.08	**0.17**
April	0.25	0.19	0.09	0.27	0.21	0.11	0.17	**0.18**
May	0.33	0.51	0.21	0.36	0.08	0.07	0.07	**0.23**
June	0.13	0.29	0.45	0.21	0.12	0.19	0.15	**0.22**
July	0.24	0.22	0.22	0.51	0.06	0.16	0.06	**0.21**
August	0.27	0.25	0.26	0.19	0.13	0.04	0.16	**0.19**
September	0.39	0.11	0.45	0.28	0.07	0.29	0.07	**0.24**
October	0.21	0.39	0.12	0.32	0.11	0.11	0.22	**0.21**
November	0.45	0.23	0.36	0.27	0.03	0.09	0.05	**0.21**
December	0.13	0.15	0.12	0.25	0.12	0.24	0.10	**0.16**

Table 5: Average Depth of Snow Cover in Inches

Source: National Weather Service

MONTH	2003	2004	2005	2006	2007	2008	2009	Total Average
January	3	8	5	1	3	4	7	**4**
February	6	11	3	1	11	10	4	**7**
March	3	0	3	0	4	2	0	**2**
April	0	0	0	0	0	0	0	**0**
May	0	0	0	0	0	0	0	**0**
June	0	0	0	0	0	0	0	**0**
July	0	0	0	0	0	0	0	**0**
August	0	0	0	0	0	0	0	**0**
September	0	0	0	0	0	0	0	**0**
October	0	0	0	0	0	0	0	**0**
November	0	0	2	0	0	2	0	**1**
December	1	1	4	1	3	6	4	**3**

Geography and Land Use Patterns

Topography, Soils, and Other Geographical Features

Understanding the local environment and land use patterns help identify changes that can have significant repercussions for people, the economy, and the environment. Some changes have natural causes, such as volcanic eruptions or drought, while other changes on the land, such as resource 0extraction, agricultural practices, and urban growth, are human-induced processes. There are other types of changes that are a combination of natural and human-induced factors; for example, landslides and floods are fundamentally natural processes that are often intensified or accelerated by human land use practices. In order to understand Newaygo County's topography, soils, and other graphical features, it is important to understand the history behind Michigan and the glacial activity.

As recently as 12,000 years ago, major glacial activity impacted Newaygo County's topography. The underlying bedrock, except for one small area, is covered by 50 to 500 feet of glacial material. Large ridges, or end moraines, developed along the front of the glacier as it halted in its retreat toward the north-east. These moraines are from a quarter of a mile to one and a half miles in width and from ten feet in height to 40 feet. The moraines form a concentric pattern that extends from the northeastern corner of the county toward the southwestern part. Level to undulating ground moraines formed as materials carried by the glacier were deposited. The outwash plains in the county are the old gravelly and sandy channels of swift streams that formed as the glacier melted.

Physical Land Features

The bedrock in Newaygo County consists of edges of bowlike formations that fill the Michigan Basin. Marshall Sandstone underlies the entire County. The Michigan Formation overlies the Michigan Sandstone in the eastern half of the County. This formation is primarily limestone, gypsum, and dolomite interceded with shale and sandstone. To the east, Bayport Limestone and Parma Sandstone progressively overlie these rocks. In the central part of the County and in some areas in the eastern half, red beds overlie the Michigan, Saginaw, and Grand River Formations. They consist mainly of sandstone, shale, clay and minor beds of limestone and gypsum. Overlying the rock formations is a mall of glacial drift, which was deposited after the Wisconsonian Glaciation. The glacial drift ranges from 200 to 800 feet in thickness. It is coarse gravel to fine lacustrine clay. Many of the soils in the County formed in the drift.

The present surface features in the County generally are the result of glacial action. Two major physiographic regions are recognized in the County, one consists of several outwash plains and lake plains in nearly level valleys having definite boundaries. Glacial melt-water streams, which were much larger than the current rivers and streams, deposited outwash

material in the valleys. The abandoned melt-water channels are filled with organic deposits in some areas and kettle lakes in others. As the ice receded and the levels of the glacial lakes dropped, the valleys were incised and terraces formed along the present streams and rivers. The other physiographic region consists of rolling and hilly moraines rising from the nearly level valleys or plains. Streams and rivers have greatly modified the surface in Newaygo County. The predominant water feature is the valley of the Muskegon River, which exits the southwestern part of the County.

Elevation

The highest elevation is 1,300 feet above sea level in the far northeastern part of the County.

The lowest elevation in the county is approximately 633 feet in the City of Newaygo near the Muskegon River.

Native Vegetation

As with many Michigan communities, Newaygo County was originally covered with a dense forest of deciduous trees. As the county was cleared for farming and development, or the trees removed for timber, the area's forests were replaced by farm fields, open field areas, orchards and smaller forests containing both deciduous and coniferous trees.

Soils Associations

A soil association is an area of land that has a distinctive proportional pattern of soils. Each association consists of one or more major soils and some minor soils and each association has a distinctive pattern of soils, relief, and drainages. The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitability can be identified on the map as well as soils that are not suitable. Because of the small scale, the map is not suitable for selecting a site for a road or building or other structure; however, more detailed maps are available for specific

areas for planning purposes. There are eight general soil associations identified for the Newaygo County area as follows:

1. Plainfield-Grattan-Brems Association: Nearly level to steep, excessively drained and moderately well-drained, sandy soils on outwash plains and moraine.

2. Cosad-Del Rey-Sickles Association: Nearly level and gently undulating, somewhat poorly drained and poorly drained, sandy and loamy soils on lake plains.

3. Glendora-Abscota-Algansee Association: Nearly level and gently undulating, very poorly drained, somewhat poorly drained, and moderately well drained, sandy and loamy soils on flood plains.

4. Marlette-Metea-Sprinks Association: Nearly level to steep, moderately well-drained and well drained, loamy and sandy soils on moraines.

5. Coloma-Spinks-Matea Association: Nearly level to steep, excessively drained and well drained, sandy soils on moraines.

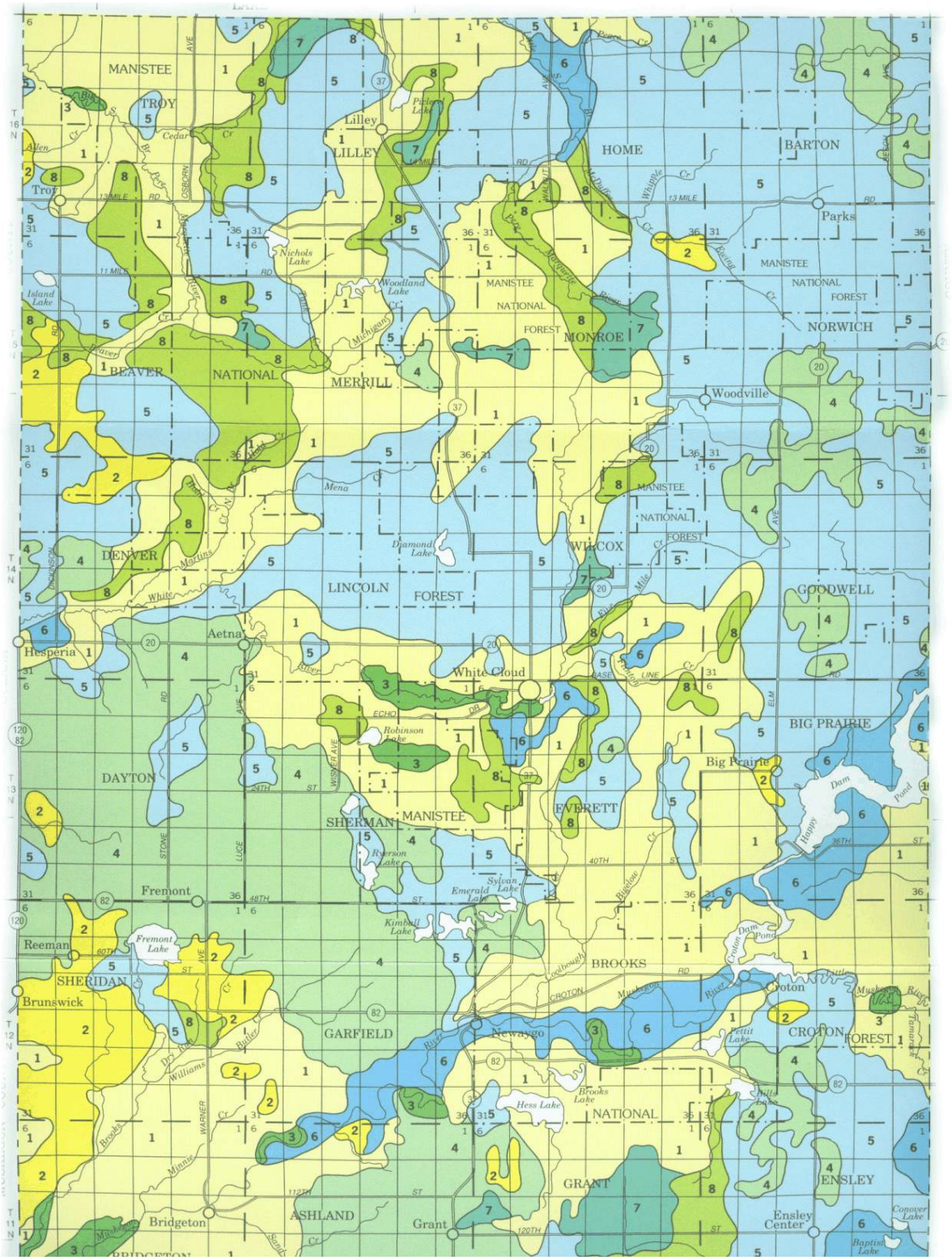
6. Toogood-Boyer Association: Nearly level to steep, somewhat excessively drained to moderately drained, sandy soils on outwash plains and terraces.

7. Adrian-Carlisle-Martisco Association: Nearly level, very poorly drained, organic soils on lake plains and outwash plains.

8. Pipestone-Covert-Kingsville Association: Nearly level and gently undulating, somewhat poorly drained, moderately well drained, and poorly drained, sandy soils on outwash plains.

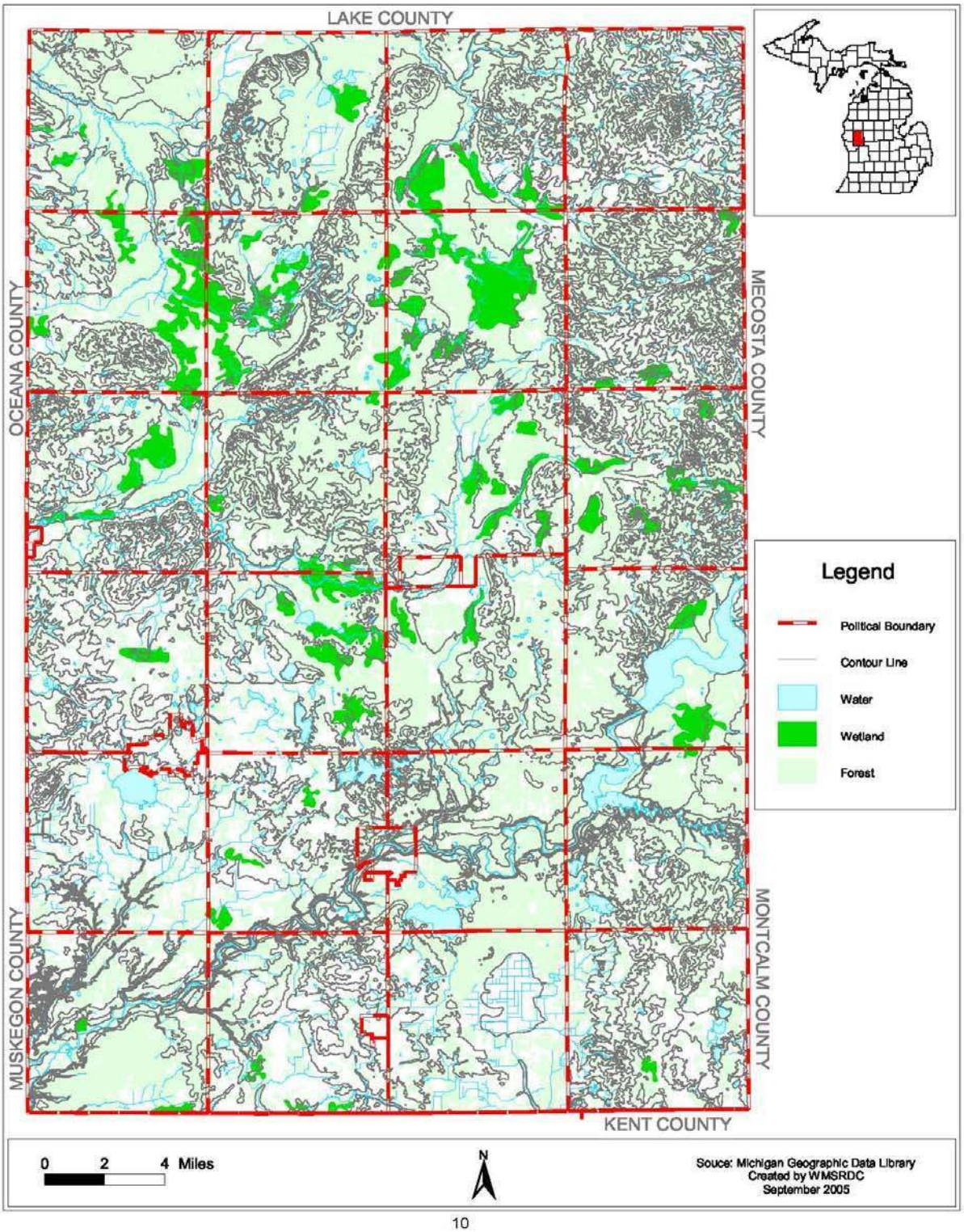
Some of the soils in the County are well suited to development. These include the less sloping, well drained soils in the Plainfield-Grattan-Brems, Coloma-Spinks-Metea, and Toogood-Boyer associations. The Cosad-Del Rey-Sickles and Marlette-Metea-Spinks associations are better suited to farming than the other associations. Most of the soils in the County are well suited or fairly well suited for woodlands. These soils are dry and sandy, which do not hold moisture long and can dry quickly. In addition, these soils promote the growth of fire prone species (grasses, oaks, red pine, jack pine, etc.). Many soils are well suited to parks and other recreational areas. Un-drained areas of Adrian and other poorly drained or very poorly drained soils provide habitat for many species of wildlife and are good nature study areas.

GENERAL SOILS MAP



MAP 2

NEWAYGO COUNTY
Natural Terrain Map



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Current Land Use

Newaygo County encompasses more rural characteristics than urban characteristics with a little over 80% of its population located in the townships. The majority of the residential, retail, and industrial development has occurred in the County's four cities, Fremont, Grant, Newaygo, and White Cloud.

Water Resources

Newaygo County has abundant surface and ground water resources. The ground water is a source of good quality drinking water for the residents of the County. Newaygo County is comprised of 234 natural lakes and ponds, 356 miles of rivers and streams covering 12,543 acres, which provide outstanding recreational opportunities. Most of the larger natural lakes are in the southern half of the County and within 10 miles of the City of Newaygo. The areas around the lakes have been intensively developed for residential uses. As a result, some of the lakes are sandy and are used intensely for residential and agricultural purposes that generate effluent from septic systems and livestock wastes, causing water quality concerns. Recent efforts have been implemented to upgrade sewage treatment in many Newaygo County waterfront areas. Another challenge is algae blooms from agricultural nutrient inputs. Again, best management practices of applying appropriate amounts of fertilizer and vegetative buffers between crop fields and waterways are being implemented, but some problems still persist. Fortunately, most of the lakes have high-quality water. Lakes with water quality challenges include Hess, Fremont, Peterson, and Hesperia Lakes. The smaller lakes in the public forest areas provide a wide variety of recreational opportunities and activities. The numerous unnamed bodies of water scattered throughout the County provide habitat for many species of wetland wildlife.

Lake Name	Lake Size in Acres
Hardy Pond	3,750 acres (2,845 acres in Newaygo County)
Croton Dam Pond	1,235 acres
Fremont Lake	790 acres
Hess Lake	764 acres
Pickerel Lake	307 acres
Brooks Lake	286 acres
Bills Lake	200 acres
Diamond Lake	188 acres
Nichols Lake	153 acres
Robinson Lake	133 acres

Newaygo County is drained by several rivers. The northern part of the County is drained by the Pere Marquette and Little Pere Marquette Rivers. The White River originates in the central plain in the County and flows west through White Cloud to Lake Michigan. The Muskegon River drains a large area of the middle and southern parts of the county flowing in a southwesterly direction through Newaygo. Crockery Creek and the Rogue River, which are in the southernmost part of the County, flow south into the Grand River Basin.

Forest Lands

Sixty-one percent of Newaygo County's 537 thousand acres of land is forested (MSU Extension 2006). Of this 62% is in private ownership, almost all owned by small, non-industrial owners. Of the 38% in public ownership, the vast majority is part of the Manistee National Forest managed by the US Forest Service. Oak-hickory, beech-maple and lowland hardwoods make up 79% of the forest land in the county. Pine types (white, red and jack) are predominant on 15% of the forested acreage.

Farming

In 2002, it is estimated that about 135,422 acres (a quarter) of Newaygo County was farmland as compared with an estimated 131,779 acres in 1997. The 2002 total estimated farmland acreage reflected a 3% increase from the 1997 estimate. The total number of farms is also up 15% from 1997, 902 farms in 2002 compared to 787 farms in 1997, however, the average size of the farm in acres has decreased 10% from 1997, 150 acres average in 2002 compared to 167 acres in 1997. The diversity of soils and conditions appropriate for a wide variety of truck and vegetable crops helped create the conditions that made Gerber in Fremont a worldwide leader in baby foods. Because many of the soils are suitable for cropland, the climate is favorable, and the markets for farm products are nearby, farming probably will continue to be an important part of the economy in Newaygo County. Since much of the prime farmland is located in the southwest and southerly portions of the County, which is also closest to the Muskegon and Grand Rapids metropolitan areas, it is anticipated that there will be increased pressure from non-farm land use development in the future. However, the nature of soils in these areas also has serious erosion limitations and these characteristics will influence future land uses.

Table 6: Agriculture-Farmstead Land Use and Farm Size
Source: 2002 Census of Agriculture

AGRICULTURE-FARMSTEAD LAND USE	Number of Farms	Acres	Total Farms%	Total Acres %
Total	**902**	**135,422**		
Total Cropland		93,491		
Total Harvested Cropland	689	72,732	76.39%	77.80%
Total Grazing Land	364	9,607	40.35%	10.28%
Farm Size in Acres				
Farms by size - 1 to 9 acres	28	153	3.10%	0.11%
Farms by size - 10 to 49 acres	312	8,769	34.59%	6.48%
Farms by size - 50 to 69 acres	87	(D)	9.65%	4.43%
Farms by size - 70 to 99 acres	114	9,095	12.64%	6.72%
Farms by size - 100 to 139 acres	97	11,156	10.75%	8.24%
Farms by size - 140 to 179 acres	59	9,264	6.54%	6.84%
Farms by size - 180 to 219 acres	45	8,803	4.99%	6.50%
Farms by size - 220 to 259 acres	33	7,762	3.66%	5.73%
Farms by size - 260 to 499 acres	70	24,917	7.76%	18.40%
Farms by size - 500 to 999 acres	40	26,425	4.43%	19.51%
Farms by size – 1,000 to 1,999 acres	15	18,956	1.66%	14.00%
Farms by size - 2,000 acres or more	2	(D)	0.22%	3.04%
Average Size of Farm in Acres		**150**		

Historic Sites and Districts

There are several historic sites in Newaygo County, however, there are no registered Historical Districts at this time that have been established.

Table 7: Places Listed in the National and or State Register of Historical Places
Source: http://www.tourism.msu.edu/TAP/Inventory/HistoricPlaces-Registr.doc

Newaygo	Big Prairie Grange No. 935 Hall	1968 Elm Avenue	Big Prairie Twp	Grange hall	03/28/1985	N/A	N/A
Newaygo	Hardy Hydroelectric Plant	6928 E. 36th Street	Big Prairie Twp.	Power plant	N/A	N/A	12/01/1997
Newaygo	Croton Congregational Church	Croton-Hardy Dr. and Division St.	Croton	Church	01/22/1987	N/A	N/A
Newaygo	Croton Hydroelectric Plant	Croton Dam Road	Croton	Power plant	N/A	N/A	08/16/1979
Newaygo	Oak Grove District No. 3 Schoolhouse	6382 East 80th	Croton Township	Schoolhouse	06/30/1988	N/A	N/A
Newaygo	Ensley Windmill Tower	4634 South Luce Avenue	Fremont	Windmill	07/26/1978	N/A	N/A
Newaygo	First Christian Reformed Church	201 North Decker Avenue	Fremont	Church	01/20/1984	N/A	N/A
Newaygo	Gerber, Cornelius, Cottage	6480 West Cottage Grove	Fremont	Frame house	10/23/1979	10/10/1983	N/A
Newaygo	City of Grant Depot and	Between Lincoln and Pine	Grant	Water tower	06/10/1980	N/A	N/A

	Water Tower	Streets					
County	**Site Name (as listed in register)**	**Site Address**	***City***	**Property Type**	**Date Listed in State Register**	**Date Historical Marker Erected**	**Date Listed in National Register**
Newaygo	Weaver, Daniel, House	84 South Cook Street	Hesperia	Frame house	09/26/1987	N/A	N/A
Newaygo	Penoyer's Sawmill	Penoyer Creek	Newaygo	Sawmill	08/22/1985	N/A	N/A
Newaygo	Saint Mark's Episcopal Church	30 Justice Street	Newaygo	Church	09/21/1983	05/26/1987	N/A
Newaygo	Woods, John F., Residence	59 Bridge Street	Newaygo	Brick house	06/10/1980	N/A	N/A
Newaygo	Birch Grove School	3962 North Felch	White Cloud	Schoolhouse	10/02/1980	N/A	N/A
Newaygo	White Cloud Village Hall	1084 Wilcox	White Cloud	Brick building	03/16/1982	N/A	N/A

Anticipated Land Use

Newaygo County's Master Plan serves as the primary policy guide for local officials considering development proposals, land divisions, capital improvements, and other matters related to land use and development; thus, it provides a stable and consistent basis for decision-making. The county does not enforce any county zoning ordinances leaving much of the land use decisions up to the individual townships and Cities. All of the Communities in Newaygo County have zoning ordinances and all but Lilley Township and Troy Township have Master Plans.

Potential Land Use Conflicts and Known Hazards

Like most communities Newaygo County does have several unique situations that present hazards or land use conflicts. Several should be noted:

All four cities within Newaygo County, Fremont, Newaygo, Grant, and White Cloud have industry located near retail and residential areas. Although the communities have not had recent significant instances where an unacceptable release of chemicals has occurred, it is a great potential to affect a substantial amount of residences should an unacceptable release occur.

M-20, and M-82 are heavily traveled east-west transportation routes and M-37 is a major north-south transportation route. These routes run through all of the Cities and Village of Hesperia in the County. In addition to privately operated vehicles, these roads are traveled by commercial truck traffic carrying many different types of hazardous materials.

The Marquette Railroad operates on CSX Transportation's rail lines running through the center of the county parallel to M-37. The rail line cuts through the heart of Grant, Newaygo and White Cloud. With several road to rail crossing throughout the county, surprisingly there is no history of car/train accidents.

Newaygo County has many water resources and flooding problems. There are 356 miles of rivers and streams within Newaygo County. The Muskegon River runs Northeast to Southwest through the center of the county. The City of Newaygo lies along the river banks along with numerous campgrounds and recreational businesses. The White River originates in the central part of the County and flows westward. The Pere Marquette and Little Pere Marquette River drain in the north east part of the county. Many portions of these areas have structures and critical infrastructure within the flood planes of these rivers.

With agriculture playing a major role in Newaygo County, first responders to fires on farms may not be aware of potential chemical hazards. Another issue with farms is the stealing of Anhydrous Ammonia to make Methamphetamine and creating good potential for a release.

Public Infrastructure

Like most rural communities public infrastructure does not extend throughout the county. Many residences provide their own water and sewer through the use of wells and septic systems. Some industry does the same. Larger companies without municipal services

normally have a second high capacity well in order to service their fire protection system. Public infrastructure is addressed in greater detail under Key Community Facilities/Organizations.

Housing Stock

Newaygo County has a total of 23,202 housing units. The housing profile of the county is much different than that of the state. Compared to the state as a whole, the county has a slightly higher level of homeownership, however major differences should be noted in the percentage of mobile homes and trailers, the percentage of vacant, the age of the home, and home values. The higher percentage of mobile homes versus multiple family housing or apartments creates the potential for additional hazards due to mobile homes being more susceptible to certain types of weather damage related to wind damage from storms or damage from hail. Another important figure to take note of is the difference of vacant housing units between Newaygo County and the State. Newaygo County has approximately 24.1% of its available housing units vacant compared to Michigan's 10.6%. Over 75% of the vacant housing in Newaygo County is seasonal and vacation homes. However, in the winter months, this can be problematic for the county since vacant homes can create problems such as broken pipes or gas leaks if they go uncared for.
Table 4, Housing Data, Newaygo County and the State of Michigan provides a summary of Newaygo County's housing stock and how it compares to the State of Michigan as a whole.

Table 8, Housing Data, Newaygo County and the State of Michigan
Sources: Median Values and raw housing data taken from the 2000 U.S. Census

HOUSING SUBJECT	Newaygo	Percentage	Michigan	Percentage
Total Number of Housing Units	23,202	100%	4,234,279	100%
Homeownership Rate	14,856	84.4%	2,269,175	73.8%
Renter-Occupied Housing Units	2,467	15.6%	992,537	26.2%
Vacant Housing Units	5,603	24.1%	448,618	10.6%
Seasonal or Recreational Units	4,394	78.4%		
Occupied Housing Units	17,599	75.9%	3,785,661	89.4%
Units in Structure				
1-unit detached	16,214	69.9%	2,699,025	71.3%
1-unit attached	139	.06%	148,573	3.9%
2 units	289	1.2%	126,697	3.3%
3 or 4 units	160	0.7%	103,764	2.7%
5 to 9 units	261	1.1%	153,497	4.1%
10 to 19 units	135	0.6%	129,340	3.4%
20 or more units	215	0.9%	195,447	5.2%
Mobile Home	5,514	23.8%	228,306	6.0%
Boat, RV, Van, etc	275	1.2%	1,012	0.0%
Age of Housing				
1999-March 2000	652	2.8%	91,872	2.2%
1995-1998	2,168	9.3%	272,594	6.4%
1990-1994	1,954	8.4%	259,389	6.1%
1980-1989	3,044	13.1%	446,197	10.5%
1970-1979	4,439	19.1%	722,799	17.1%
1960-1969	3,237	14.0%	602,670	14.2%
1940-1959	4,086	17.6%	1,123,299	26.5%
1939 or earlier	3,622	15.6%	715,459	16.9%
Total Housing	23,202		4,234,279	
Median Year Built			1965	
Home Values				
Less than $50,000	996	13.1%	224,603	9.9%
$50,000 to $99,999	3,678	48.2%	711,648	31.4%
$100,000 to $149,999	1,832	24.0%	603,454	26.6%
$150,000 to $199,999	657	8.6%	339,716	15.0%
$200,000 to $299,999	400	5.2%	252,044	11.1%
$300,000 to $499,999	53	.07%	104,079	4.6%
$500,000 to $999,999	9	0.1%	27,642	1.2%
$1,000,000 or more	0	0.0%	5,989	0.3%
Median Value	$88,700		$115,600	

Table 9, Housing Data, City of Fremont and Newaygo County
Sources: Median Values and raw housing data taken from the 2000 U.S. Census

HOUSING SUBJECT	City of	Percentage	Newaygo	Percentage
Total Number of Housing	1,943	100%	23,202	100%
Homeownership Rate	1,267	70.9%	14,856	84.4%
Renter-Occupied Housing	521	29.1%	2,467	15.6%
Vacant Housing Units	155	8.0%	5,603	24.1%
Seasonal or Recreational	29	1.5%	4,394	78.4%
Occupied Housing Units	1,788	92.0%	17,599	75.9%
Units in Structure				
1-unit detached	1,127	57.6%	16,214	69.9%
1-unit attached	49	2.5%	139	.06%
2 units	128	6.5%	289	1.2%
3 or 4 units	79	4.0%	160	0.7%
5 to 9 units	175	8.9%	261	1.1%
10 to 19 units	60	3.1%	135	0.6%
20 or more units	55	2.8%	215	0.9%
Mobile Home	285	14.6%	5,514	23.8%
Boat, RV, Van, etc	0	0.0%	275	1.2%
Age of Housing				
1999-March 2000	38	1.9%	652	2.8%
1995-1998	145	7.4%	2,168	9.3%
1990-1994	173	8.8%	1,954	8.4%
1980-1989	223	11.4%	3,044	13.1%
1970-1979	256	13.1%	4,439	19.1%
1960-1969	256	13.1%	3,237	14.0%
1940-1959	503	25.7%	4,086	17.6%
1939 or earlier	364	18.6%	3,622	15.6%
Total Housing	1,943		23,202	
Median Year Built				
Home Values				
Less than $50,000	84	8.9%	996	13.1%
$50,000 to $99,999	493	52.4%	3,678	48.2%
$100,000 to $149,999	235	25.0%	1,832	24.0%
$150,000 to $199,999	99	10.5%	657	8.6%
$200,000 to $299,999	22	2.3%	400	5.2%
$300,000 to $499,999	0	0.0%	53	.07%
$500,000 to $999,999	7	0.7%	9	0.1%
$1,000,000 or more	0	0.0%	0	0.0%
Median Value	$90,600		$88,700	

Table 10, Housing Data, City of Grant and Newaygo County
Sources: Median Values and raw housing data taken from the 2000 U.S. Census

HOUSING SUBJECT	City of	Percentage	Newaygo	Percentage
Total Number of Housing	344	100%	23,202	100%
Homeownership Rate	214	66.3%	14,856	84.4%
Renter-Occupied Housing	109	33.7%	2,467	15.6%
Vacant Housing Units	21	6.1%	5,603	24.1%
Seasonal or Recreational	2	0.6%	4,394	78.4%
Occupied Housing Units	323	93.9%	17,599	75.9%
Units in Structure				
1-unit detached	230	66.3%	16,214	69.9%
1-unit attached	2	0.6%	139	.06%
2 units	17	4.9%	289	1.2%
3 or 4 units	21	6.1%	160	0.7%
5 to 9 units	20	5.8%	261	1.1%
10 to 19 units	19	5.5%	135	0.6%
20 or more units	0	0.0%	215	0.9%
Mobile Home	38	11.0%	5,514	23.8%
Boat, RV, Van, etc	0	0.0%	275	1.2%
Age of Housing				
1999-March 2000	2	.06%	652	2.8%
1995-1998	14	4.0%	2,168	9.3%
1990-1994	20	5.8%	1,954	8.4%
1980-1989	43	12.4%	3,044	13.1%
1970-1979	51	14.7%	4,439	19.1%
1960-1969	24	6.9%	3,237	14.0%
1940-1959	81	23.3%	4,086	17.6%
1939 or earlier	112	32.3%	3,622	15.6%
Total Housing	344		23,202	
Median Year Built				
Home Values				
Less than $50,000	25	13.7%	996	13.1%
$50,000 to $99,999	120	65.6%	3,678	48.2%
$100,000 to $149,999	22	12.0%	1,832	24.0%
$150,000 to $199,999	4	2.2%	657	8.6%
$200,000 to $299,999	12	6.6%	400	5.2%
$300,000 to $499,999	0	0.0%	53	.07%
$500,000 to $999,999	0	0.0%	9	0.1%
$1,000,000 or more	0	0.0%	0	0.0%
Median Value	$77,700		$88,700	

Table 11, Housing Data, City of Newaygo and Newaygo County
Sources: Median Values and raw housing data taken from the 2000 U.S. Census

HOUSING SUBJECT	City of	Percentage	Newaygo	Percentage
Total Number of Housing	707	100%	23,202	100%
Homeownership Rate	455	73.4%	14,856	84.4%
Renter-Occupied Housing	165	26.6%	2,467	15.6%
Vacant Housing Units	87	12.3%	5,603	24.1%
Seasonal or Recreational	15	2.1%	4,394	78.4%
Occupied Housing Units	620	87.7%	17,599	75.9%
Units in Structure				
1-unit detached	458	64.1%	16,214	69.9%
1-unit attached	6	0.8%	139	.06%
2 units	26	3.6%	289	1.2%
3 or 4 units	27	3.8%	160	0.7%
5 to 9 units	24	3.4%	261	1.1%
10 to 19 units	27	3.8%	135	0.6%
20 or more units	28	3.9%	215	0.9%
Mobile Home	118	16.5%	5,514	23.8%
Boat, RV, Van, etc	0	0.0%	275	1.2%
Age of Housing				
1999-March 2000	54	7.6%	652	2.8%
1995-1998	88	12.3%	2,168	9.3%
1990-1994	16	2.2%	1,954	8.4%
1980-1989	67	9.4%	3,044	13.1%
1970-1979	44	6.2%	4,439	19.1%
1960-1969	60	8.4%	3,237	14.0%
1940-1959	126	17.6%	4,086	17.6%
1939 or earlier	259	36.3%	3,622	15.6%
Total Housing	707		23,202	
Median Year Built				
Home Values				
Less than $50,000	66	19.4%	996	13.1%
$50,000 to $99,999	221	65.0%	3,678	48.2%
$100,000 to $149,999	38	11.2%	1,832	24.0%
$150,000 to $199,999	4	1.2%	657	8.6%
$200,000 to $299,999	10	2.9%	400	5.2%
$300,000 to $499,999	1	.03%	53	.07%
$500,000 to $999,999	0	0.0%	9	0.1%
$1,000,000 or more	0	0.0%	0	0.0%
Median Value	$74,500		$88,700	

Table 12, Housing Data, City of White Cloud and Newaygo County
Sources: Median Values and raw housing data taken from the 2000 U.S. Census

HOUSING SUBJECT	City of	Percentage	Newaygo	Percentage
Total Number of Housing Units	553	100%	23,202	100%
Homeownership Rate	285	57.7%	14,856	84.4%
Renter-Occupied Housing Units	209	42.3%	2,467	15.6%
Vacant Housing Units	59	10.7%	5,603	24.1%
Seasonal or Recreational Units	10	1.8%	4,394	78.4%
Occupied Housing Units	494	89.3%	17,599	75.9%
Units in Structure				
1-unit detached	341	61.4%	16,214	69.9%
1-unit attached	2	0.4%	139	.06%
2 units	26	4.7%	289	1.2%
3 or 4 units	2	0.4%	160	0.7%
5 to 9 units	24	4.3%	261	1.1%
10 to 19 units	14	2.5%	135	0.6%
20 or more units	51	9.2%	215	0.9%
Mobile Home	95	17.1%	5,514	23.8%
Boat, RV, Van, etc	0	0.0%	275	1.2%
Age of Housing				
1999-March 2000	2	.04%	652	2.8%
1995-1998	50	9.0%	2,168	9.3%
1990-1994	36	6.3%	1,954	8.4%
1980-1989	60	10.8%	3,044	13.1%
1970-1979	82	14.8%	4,439	19.1%
1960-1969	65	11.7%	3,237	14.0%
1940-1959	134	24.1%	4,086	17.6%
1939 or earlier	127	22.9%	3,622	15.6%
Total Housing	553		23,202	
Median Year Built				
Home Values				
Less than $50,000	67	29.4%	996	13.1%
$50,000 to $99,999	137	58.8%	3,678	48.2%
$100,000 to $149,999	22	9.6%	1,832	24.0%
$150,000 to $199,999	5	2.2%	657	8.6%
$200,000 to $299,999	0	0.0%	400	5.2%
$300,000 to $499,999	0	0.0%	53	.07%
$500,000 to $999,999	0	0.0%	9	0.1%
$1,000,000 or more	0	0.0%	0	0.0%
Median Value	$67,100		$88,700	

Table 13, Mobile Homes Distribution in Newaygo County
Sources: Raw housing data taken from the 2000 U.S. Census

Created By: WMSRDC

February 2005

NEWAYGO COUNTY **MOBILE HOMES DISTRIBUTION**		
COMMUNITY	**# Mobile Homes**	**% Mobile Homes**
Newaygo County *	5,514	23.8
Fremont City	285	14.6
Grant City	38	11.0
Newaygo City	118	16.5
White Cloud City	95	17.1
Hesperia Village	18	4.0
Ashland Township	203	21.9
Barton Township	128	33.6
Beaver Township	83	28.3
Big Prairie Township	809	55.0
Bridgeton Township	276	33.9
Brooks Township	353	18.0
Croton Township	430	25.7
Dayton Township	68	9.2
Denver Township	295	31.7
Ensley Township	201	21.3
Everett Township	315	35.2
Garfield Township	137	12.7
Goodwell Township	55	22.4
Grant Township	294	25.2
Home Township	63	27.8
Lilley Township	252	24.9
Lincoln Township	179	21.6
Merrill Township	215	26.4
Monroe Township	96	30.5
Norwich Township	43	18.5
Sheridan Township	8	0.9
Sherman Township	170	17.2
Troy Township	61	35.1
Wilcox Township	244	41.9

* total of cities and townships; village total already included with township totals

source: U.S. Census Bureau

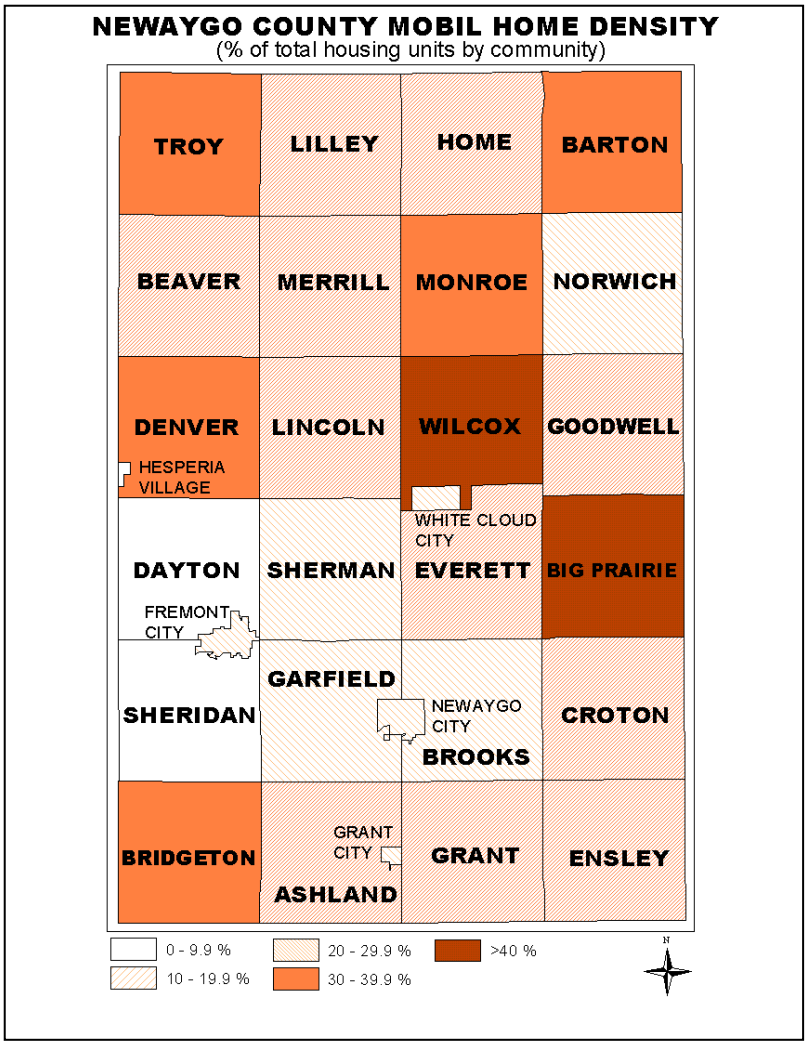
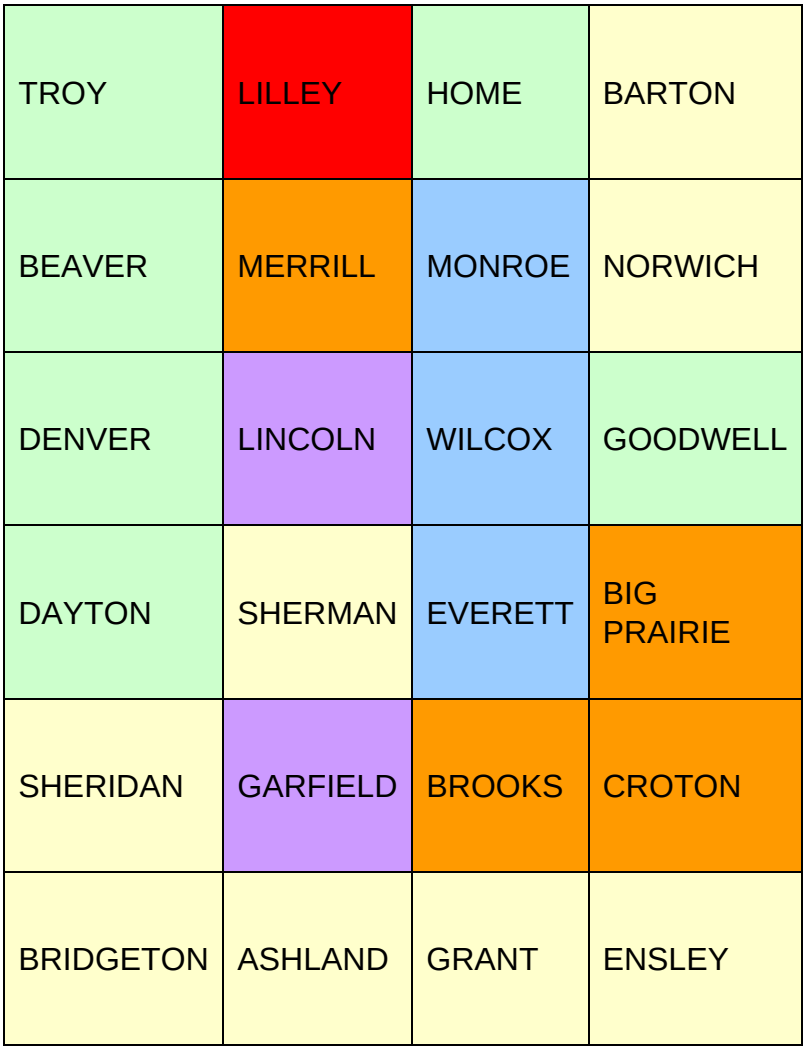


Table 14, Seasonal Homes Distribution in Newaygo County
Sources: Raw housing data taken from the 2000 U.S. Census

NEWAYGO COUNTY SEASONAL HOMES DISTRIBUTION		
COMMUNITY	**# Seasonal Homes**	**% Seasonal Homes**
Newaygo County *	4,394	100%
Fremont City	29	0.6%
Grant City	2	0.0%
Newaygo City	15	0.3%
White Cloud City	10	0.2%
Hesperia Village	12	0.3%
Ashland Township	60	1.3%
Barton Township	65	1.4%
Beaver Township	84	1.9%
Big Prairie Township	432	9.6%
Bridgeton Township	37	0.8%
Brooks Township	459	10.2%
Croton Township	474	10.6%
Dayton Township	34	0.8%
Denver Township	112	2.5%
Ensley Township	69	1.5%
Everett Township	138	3.1%
Garfield Township	208	4.6%
Goodwell Township	78	1.7%
Grant Township	54	1.2%
Home Township	117	2.6%
Lilley Township	622	13.9%
Lincoln Township	294	6.5%
Merrill Township	451	10.0%
Monroe Township	144	3.2%
Norwich Township	30	0.7%
Sheridan Township	43	1.0%
Sherman Township	201	4.5%
Troy Township	75	1.7%
Wilcox Township	141	3.1%

* total of cities and townships; village total already included with township totals

source: U.S. Census Bureau



Transportation Network

Highways and Roads

Several modes of transportation are available within Newaygo County, however movement into, out of, and within the county is primarily by private automobile. Four state highways serve the county. M-37 runs the entire length of Newaygo County from North to South and connects Grand Rapids, Grant, Newaygo, White Cloud, Baldwin, and Traverse City. M-37 also connects to M-20 and M-82 in Newaygo County. M-20 runs the east to west and connects Mt Pleasant, Big Rapids, White Cloud, Hesperia, and Hart. M-82 also runs east to west and connects Howard City, Newaygo, Fremont, and Muskegon. The Newaygo County Road Commission maintains local roads and bridges and contracts with MDOT for snow and debris removal on State roads. Roads include a mix of both paved and graveled surfaces. North-South Roads west of M-37 are named after Presidents of the United States and east of M-37 are named after trees. East-West Roads north of M-20 are Mile Roads and south of M-20 are 10ths. Major local connectors or "Class A" roads include the following list:

Class A Road List		
Road Name	From	To
9 Mile Road	Cypress	Mecosta County
Cypress	8 Mile Road	9 Mile Road
8 Mile Road	Elm Street	Cypress
Elm Street	8 Mile Road	Polk Ave
Polk/Fillmore	Oak Street	Elm Street
Oak Street	Fillmore	7 Mile Road
7 Mile Road	Oak Street	Thornapple Ave
6 Mile Road	Thornapple Ave	Poplar Ave
Poplar Ave	6 Mile Road	Monroe Ave
Monroe Ave	Poplar	M-37
Echo Drive	White Cloud	Bigham
Bigham	Echo	12th Street
12th Street	Bigham	Wisner

Wisner	12th Street	24th Street

Class A Road List CONTINUED		
Road Name	From	To
24th Street	Wisner	Baldwin
Baldwin	24th Street	72nd Street
16th Street	M-37	Walnut
40th Street	M-37	Gordon
48th Street	Gordon	Warner
Stone	1 Mile	48th Street
Green Ave	48th Street	64th Street
Warner	72nd Street	White River
104th Street	Maple Island	Dickerson
Dickerson	104th Street	112th Street
112th Street	Dickerson	Fitzgerald
128th Street	Alger	Bagley
Bagley	128th Street	124th Street
124th Street	Bagley	Wisner
Wisner	124th Street	120th Street
Moore	Alger	Croswell
120th Street	Cypress	Elder

Local Transit Service

There is no transit Service in Newaygo County.

Airports

The Newaygo County has several municipal airports within the County. The White Cloud Airport is located just 1 Mile north of the City of White Cloud on M-37 and is owned and operated by the City of White Cloud. The airport is primarily used for business, flight school, and industry and does not have scheduled flights. The airport has one runways, Runway 18/36. Runway 18/36 is an asphalt runway 2917 ft by 60 ft at an elevation of 915.0 ft lighted by medium intensity runway edge lights. 100 Low Lead Aviation Fuel is available at the airport as well as hangars and tie-downs for parking.

The Fremont Municipal Airport is 3 miles south west of the City of Fremont and is owned and operated by the City of Fremont. The airport is primarily used for business, glider operations, and industry and does not have scheduled flights. The airport has two asphalt runways, runway 18/36 and runway 9/27. Runway 18/36 is 6,498 feet by 100 feet at an elevation of 769.7 ft with a weight bearing capacity of 30,000 lbs and is marked with runway lights. Runway 9/27 is 3502 feet by 75 feet at an elevation of 766.9 feet with a weight bearing capacity of 16,000 lbs on a single wheel and is marked with medium intensity runway edge lights. 100 Low Lead Aviation Fuel and Jet A Fuel are both available along with hangars and tie-downs for parking.

Grant Airport is located 2 miles north east of Grant and is privately owned by David Koopman from Grant. The airport has one turf runway, Runway 9/27, 2,517 feet by 120 feet at an elevation of 815.0 feet marked with low intensity runway edge lights. The airport does not have fuel, however it does have tie-downs for parking.

There are six major airports that are located within two hours of Newaygo County.

Airport Name	Distance from County
Muskegon County Airport	15 Miles
Gerald R. Ford International Airport	25 Miles
Traverse City Cherry Capital Airport	75 Miles
MBS International Airport	83 Miles
Kalamazoo Battle Creek International Airport	85 Miles
Lansing Capital Region International Airport	85 Miles
Bishop (Flint) International Airport	135 Miles
Detroit Metropolitan International Airport	185 Miles

Rail Service and Water Ports

Newaygo County does not have either passenger rail service or a water port. The closest Amtrak Stations are in Grand Rapids which is approximately 25 miles outside the county, Kalamazoo which is 80 miles outside the county, Battle Creek which is 92 miles outside the county, and East Lansing which is 96 miles outside the county. The closest water ports are located in Muskegon which is approximately 15 miles outside the county, Grand Haven which is 35 miles outside the county, Ludington which is 40 miles outside the County, and Holland which is 55 miles outside the county.

Population Characteristics

Current and Historical Data

The 2000 census shows since 1970 Newaygo County is currently growing at a faster rate than the state average, however this has not always been true. From the 1900 through the 1970 Census, Newaygo County grew at a slower rate than the state through 1970 and declined in population twice during the early 1900's. The population decline occurred during WWI and a time of disease, such as the Spanish Flu, Small Pox, and Consumption. Table 15, Past Population Comparison, Newaygo County and the State of Michigan 1850-2005 shows Newaygo County's population during each census since 1850, the percentage change in Newaygo County's population, and the percentage change in Michigan's population.

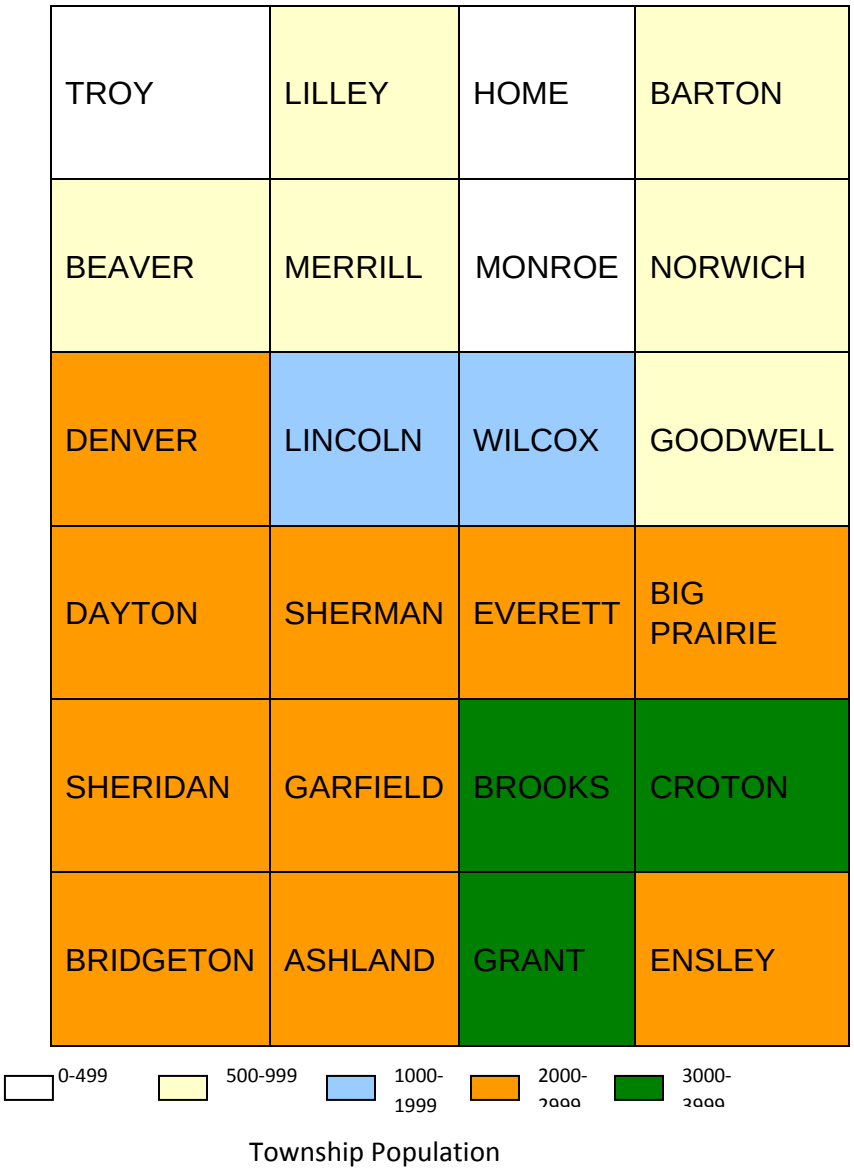
Table 15: Past Population Comparison, Newaygo County and the State of Michigan 1850-2005
Sources: Population figures and other raw data taken from U.S. Census Historical Data
Percentages calculated by Newaygo County Emergency Services

YEAR	Newaygo County Population	Newaygo County % Change	Michigan Population	Michigan % Change
1850	510			
1860	2,760	81.52%		
1870	7,294	62.16%		
1880	14,688	101.37%		
1890	20,476	29.59%		
1894	19,125	-7.06%		
1900	17,673	-8.21%	2,420,982	
1910	19,220	8.75%	2,810,173	16.08%
1920	17,378	-9.25%	3,668,412	30.54%
1930	17,029	-2.00%	4,842,325	32.00%
1940	19,286	13.25%	5,256,106	8.55%
1950	21,567	11.83%	6,371,766	21.23%
1960	24,160	12.02%	7,823,194	22.78%
1970	27,992	15.86%	8,875,083	13.45%
1980	34,917	24.74%	9,262,078	4.36%
1990	38,202	9.41%	9,295,297	0.36%
2000	47,874	25.84%	9,938,444	6.92%
2005	50,019	4.48%	10,095,643	1.58%

Projected Population

Based on data for projected population trends by West Michigan Shoreline Regional Development Commission, Newaygo County will continue to grow at a faster rate than the state through the year 2020. Table 16, Population Trends and Future Population Projections, Newaygo County and the State of Michigan 1990-2005.

Table 16: Future Population Projections, Newaygo County and the State of Michigan 2005-2020
Sources: Population figures from University of Michigan, Institute of Labor and Industrial Relations and West Michigan Shoreline Regional Development Commission



	1990	2000	2005
Michigan	***9,295,277***	***9,938,444***	***10,095,643***
Newaygo	***38,202***	***47,874***	***50,019***
Cities			
Fremont	3,875	4,224	4,256
Grant	764	881	885
Newaygo	1,336	1,670	1,685
White	1,147	1,420	1,432
Villages			
Hesperia	846	954	987
Townships			
Ashland	1,997	2,570	2,659
Barton	624	820	857
Beaver	417	608	659
Big Prairie	1,731	2,465	2,574
Bridgeton	1,574	2,098	2,391
Brooks	2,728	3,671	3,744
Croton	1,965	3,042	3,398
Dayton	1,971	2,002	2,065
Denver	1,532	1,971	2,052
Ensley	1,984	2,474	2,631
Everett	1,519	1,985	2,071
Garfield	2,067	2,464	2,524
Goodwell	358	551	600
Grant	2,558	3,130	3,235
Home	202	261	981
Lilley	565	788	808
Lincoln	969	1,338	1,388
Merrill	451	590	615
Monroe	247	324	354
Norwich	499	557	615
Sheridan	2,252	2,423	2,473
Sherman	1,866	2,159	2,267
Troy	173	243	278
Wilcox	831	1,145	1,212

Seasonal Population Trends

In the spring and summer, Newaygo County has a significant population increase from citizens who own summer homes in the area (8,884 homes), to campgrounds (Over 2,000 campsites), 7 summer Youth Camps, and the various outdoor recreational activities throughout the county, almost doubling the population in the tourism months for a peak population to approximately 90,700 people.

Age, Gender, Racial, Non-English Speaking, Special Needs, and Educational Data

In addition to population totals, U.S. Census data provides insight into other social characteristics of our country, state, and of Newaygo County's residents. Tables seventeen through twenty-seven provide a quick snapshot of many of these characteristics. Once again, for comparison purposes, statistics for the State of Michigan are also included.

Age Distribution

Age distribution of a county can influence the types of facilities and programs within the county. Age distribution within Newaygo County closely mirrors that of the state as a whole. The median age for Newaygo County is 36 while the median age for the State of Michigan is 35. Newaygo County has a larger percentage of citizens under the age of twenty, 31.7%, compared to the State, 29.0%, and a similar percentage of citizens over the age of sixty-five, 12.8%, compared to the State, 12.3%. These statistics are important in identifying the number of special needs populations or vulnerable facilities such as schools, nursing homes, and extended care facilities within the County. Special needs populations are an important consideration in disaster planning and response due to need for additional support and assistance beyond standard care.

Table 17: Age Distribution within Newaygo County and the State of Michigan
Source: 2000 U.S. Census, American Fact Finder

AGE CATEGORY	Newaygo	Newaygo	Michigan	Michigan %
	47,874		**9,938,444**	
Median Age	36		35	
Under 5 years	3,285	6.9%	672,005	6.8%
5 to 9 years	3,884	8.1%	745,181	7.5%
10 to 14 years	4,365	9.1%	747,012	7.5%
15 to 19 years	3,653	7.6%	719,839	7.2%
20 to 24 years	2,311	4.8%	643,839	6.5%
25 to 34 years	5,465	11.4%	1,362,171	13.7%
35 to 44 years	7,699	16.1%	1,598,373	16.1%
45 to 54 years	6,337	13.2%	1,367,939	13.8%
55 to 59 years	2,532	5.3%	485,895	4.9%
60 to 64 years	2,228	4.7%	377,144	3.8%
65 to 74 years	3,431	7.2%	642,880	6.5%
75 to 84 years	2,041	4.3%	433,678	4.4%
85 years and over	643	1.3%	142,460	1.4%

Gender Distribution

Most communities have a higher proportion of females since they have a longer life expectancy. In Michigan, females account for 51% of the population in Michigan and in Newaygo County females account for 50.1 % of Newaygo County's population. The City of White Cloud has a larger male population due to the County Jail population. This can be concluded by looking at the gender distribution of The City of Fremont, Grant, Newaygo, and the Village of Hesperia.

Table 18: Gender Distribution within Newaygo County and the State of Michigan
Source: 2000 U.S. Census, American FactFinder

SEX	Fremont %	Grant %	Newaygo %	White Cloud %	Hesperia %	Newaygo County	Newaygo County %	Michigan	Michigan
Total	**4,224**	**881**	**1,670**	**1,147**	**954**	**47,874**		**9,938,444**	
Male	45.1%	46.3%	47.1%	51.2%	43.7%	23 891	49.9%	4,873,095	49.0%
Female	54.9%	53.7%	52.9%	48.8%	56.3%	23 983	50.1%	5,065,349	51.0%

Racial Distribution

The racial distribution of Newaygo County is different than Michigan's distribution. Overall, Newaygo County is less diverse than the state as a whole. Newaygo County is predominantly a White Community, with a small percentage of African American, American Indian, and Asian.

Table 19: Racial Characteristics of Newaygo County and the State of Michigan
Source: 2000 U.S. Census

RACE	Newaygo County	Newaygo County %	Michigan	Michigan %
One race	47,165	98.5%	9,746,028	98.1%
White	45,386	94.8%	7,966,053	80.2%
Black or African American	535	1.1%	1,412,742	14.2%
American Indian and Alaska Native	311	0.6%	58,479	0.6%
Asian	140	0.3%	176,510	1.8%
Asian Indian	18	0.0%	54,631	0.5%
Chinese	13	0.0%	33,189	0.3%
Filipino	15	0.0%	17,377	0.2%
Japanese	9	0.0%	11,288	0.1%
Korean	31	0.1%	20,886	0.2%
Vietnamese	14	0.0%	13,673	0.1%
Other Asian [1]	40	0.1%	25,466	0.3%
Native Hawaiian and Other Pacific	14	0.0%	2,692	0.0%
Native Hawaiian	3	0.0%	734	0.0%
Guamanian or Chamorro	5	0.0%	622	0.0%
Samoan	1	0.0%	505	0.0%
Other Pacific Islander [2]	5	0.0%	831	0.0%
Some other race	779	1.6%	129,552	1.3%
Two or more races	709	1.5%	192,416	1.9%

Household Distribution

Household Distribution can influence a community's needs since the distribution often identifies unique community traits. Newaygo County has several household characteristics that may influence hazard planning. Table 20 shows the County has a higher proportion of family households than Michigan. Within the overall category of family households, Newaygo County has a higher percentage of married couples than the state, a lower proportion of female householders with no spouse and lower percentage of male householders with no spouse comparison to Michigan as a whole.

Table 20: Household Characteristics of Newaygo County and the State of Michigan
Source: 2000 U.S. Census

HOUSEHOLDS BY TYPE	Newaygo County	Newaygo County	Michigan	Michigan %
Total households	**17,599**	**100%**	**3,785,661**	**100%**
Family households (families)	12,941	73.5%	2,575,699	68.0%
With own children under 18 years	6,198	35.2%	1,236,713	32.7%
Married-couple family	10,597	60.2%	1,947,710	51.4%
With own children under 18 years	4,638	26.4%	873,227	23.1%
Female householder, no husband present	1,587	9.0%	473,802	12.5%
With own children under 18 years	1,054	6.0%	283,758	7.5%
Non-family households	4,658	26.5%	1,209,962	32.0%
Householder living alone	3,910	22.2%	993,607	26.2%
Householder 65 years and over	1,592	9.0%	355,414	9.4%
Households with individuals under 18 years	6,698	38.1%	1,347,469	35.6%
Households with individuals 65 years and over	4,247	24.1%	862,730	22.8%
Average household size	2.68		2.56	
Average family size	3.13		3.1	

Table 21: Household Characteristics of City of Fremont and Newaygo County
Source: 2000 U.S. Census

HOUSEHOLDS BY TYPE	Fremont	Fremont %	Newaygo County	Newaygo County %
Total households	**1,788**	**100.0%**	**17,599**	**100%**
Family households (families)	1,414	63.8%	12,941	73.5%
With own children under 18 years	539	30.1%	6,198	35.2%
Married-couple family	894	50.0%	10,597	60.2%
With own children under 18 years	369	20.6%	4,638	26.4%
Female householder, no husband present	203	11.4%	1,587	9.0%
With own children under 18 years	140	7.8%	1,054	6.0%
Non-family households	647	36.2%	4,658	26.5%
Householder living alone	580	32.4%	3,910	22.2%
Householder 65 years and over	302	16.9%	1,592	9.0%
Households with individuals under 18 years	570	31.9%	6,698	38.1%
Households with individuals 65 years and over	597	33.4%	4,247	24.1%
Average household size	2.34		2.68	
Average family size	2.97		3.13	

Table 22: Household Characteristics of City of Grant and Newaygo County
Source: 2000 U.S. Census

HOUSEHOLDS BY TYPE	Grant	Grant %	Newaygo County	Newaygo County %
Total households	**323**	**100%**	**17,599**	**100%**
Family households (families)	214	66.3%	12,941	73.5%
With own children under 18 years	121	37.5%	6,198	35.2%
Married-couple family	155	48.0%	10,597	60.2%
With own children under 18 years	80	24.8%	4,638	26.4%
Female householder, no husband present	47	14.6%	1,587	9.0%
With own children under 18 years	31	9.6%	1,054	6.0%
Non-family households	109	33.7%	4,658	26.5%
Householder living alone	94	29.1%	3,910	22.2%
Householder 65 years and over	62	19.2%	1,592	9.0%
Households with individuals under 18 years	127	39.3%	6,698	38.1%
Households with individuals 65 years and over	101	31.3%	4,247	24.1%
Average household size	2.59		2.68	
Average family size	3.22		3.13	

Table 23: Household Characteristics of City of Newaygo and Newaygo County
Source: 2000 U.S. Census

HOUSEHOLDS BY TYPE	Newaygo	Newaygo %	Newaygo County	Newaygo County %
Total households	**620**	**100%**	**17,599**	**100%**
Family households (families)	450	72.6%	12,941	73.5%
With own children under 18 years	258	41.6%	6,198	35.2%
Married-couple family	315	50.8%	10,597	60.2%
With own children under 18 years	157	25.3%	4,638	26.4%
Female householder, no husband present	111	17.9%	1,587	9.0%
With own children under 18 years	83	13.4%	1,054	6.0%
Non-family households	170	27.4%	4,658	26.5%
Householder living alone	147	23.7%	3,910	22.2%
Householder 65 years and over	48	7.7%	1,592	9.0%
Households with individuals under 18 years	275	44.4%	6,698	38.1%
Households with individuals 65 years and over	136	21.9%	4,247	24.1%
Average household size	2.69		2.68	
Average family size	3.16		3.13	

Table 24: Household Characteristics of City of White Cloud and Newaygo County
Source: 2000 U.S. Census

HOUSEHOLDS BY TYPE	White Cloud	White Cloud%	Newaygo County	Newaygo County %
Total households	**494**	**100.0%**	**17,599**	**100%**
Family households (families)	320	64.8	12,941	73.5%
With own children under 18 years	163	33.0	6,198	35.2%
Married-couple family	211	42.7	10,597	60.2%
With own children under 18 years	86	17.4	4,638	26.4%
Female householder, no husband present	86	17.4	1,587	9.0%
With own children under 18 years	63	12.8	1,054	6.0%
Non-family households	174	35.2	4,658	26.5%
Householder living alone	152	30.8	3,910	22.2%
Householder 65 years and over	73	14.8	1,592	9.0%
Households with individuals under 18 years	178	36.0	6,698	38.1%
Households with individuals 65 years and over	145	29.4	4,247	24.1%
Average household size	2.47		2.68	
Average family size	3.07		3.13	

Primary Language

The primary language spoken at home is less diverse than Michigan as a whole. A higher percentage of Newaygo County households speak English at home compared to the State of Michigan.

Table 25: English Speaking Households
Source: 2000 U.S. Census

LANGUAGE SPOKEN AT HOME	Newaygo County	Newaygo County%	Michigan	Michigan%
Population 5 years and over	**44,614**	**100%**	**9,268,782**	**100%**
English only	42,488	95.2%	8,487,401	91.6%
Language other than English	2,126	4.8%	781,381	8.4%
Speak English less than 'very well	785	1.8%	294,606	3.2%
Spanish	1,418	3.2%	246,688	2.7%
Speak English less than "very well"	536	1.2%	100,689	1.1%
Other Indo-European languages	570	1.3%	303,122	3.3%
Speak English less than "very well"	172	0.4%	96,900	1.0%
Asian and Pacific Island languages	118	0.3%	104,467	1.1%
Speak English less than "very well"	70	0.2%	48,454	0.5%

Physical Disabilities

Special needs populations or individuals with physical disabilities can require additional assistance in the event of certain emergencies such as power outages or severe weather. Compared to the State of Michigan, Newaygo County has a higher percentage of people with a physical disability.

Table 26: Population with Physical Disabilities
Source: 2000 US Census of Population

DISABILITY STATUS OF THE CIVILIAN NON-INSTITUTIONALIZED POPULATION	Newaygo County	Newaygo County%	Michigan	Michigan %
Population 5 to 20 years	**12,347**	**100%**	**2,335,938**	**100%**
With a disability	1,281	10.4%	197,611	8.5%
Population 21 to 64 years	**25,863**	**100%**	**5,631,322**	**100%**
With a disability	5,281	20.4%	1,017,943	18.1%
Percent employed	2,651	50.2%	54.8%	
No disability	20,582	17.6%	4,613,379	81.9%
Percent employed	15,725	76.4%	77.9%	
Population 65 years and over	**5,900**	**100%**	**1,171,080**	**100**
With a disability	2,390	40.5%	495,677	42.3%

Education

Educational attainment is important for several reasons, many of which lead to quality of life issues.

Based on the Age Distribution, Newaygo County has a larger percentage of people under the age of twenty, 31.7% and a larger percentage of children enrolled in Grade School (K-12), 89.5%, than Michigan, 71.0%. However, only 10.6% of the population is enrolled in College or Graduate School in Newaygo County. This number is low due to several contributing factors. Newaygo County is within one hour of eight large universities, Davenport University (Grand Rapids and Lansing Campuses), Cornerstone University, Michigan State University, Grand Valley State University, Western Michigan University, Central Michigan University, and Ferris State University. These Universities offer a wide variety of two-four year degrees as well as Masters and Doctorate Degrees. Newaygo County is also close to seven Colleges and Community Colleges, Montcalm Community College, Calvin College, Aquinas College, Grand Rapids Community College, Alma College, Lansing Community College, Baker College, Muskegon Community College, West Shore Community College, and Hope College. Many of the Colleges and all of the Universities offer student housing in dorms and apartment complexes. Due to being at school for an extended period of time, many students often change their residency to the city when they are going to school, decreasing the population enrolled in College or Graduate School in areas that do not have large educational facilities with housing. A review of data for individuals age 25 and over shows that Newaygo County has a slightly higher percentage of high school graduates and a lower percentage of population with some college with no degree, and college graduates some type of degree when compared to the state as a whole.

Table 27: Educational Attainment, Newaygo County and the State of Michigan
Source: 2000 U.S. Census, American FactFinder

SCHOOL ENROLLMENT	Newaygo County	Newaygo County %	Michigan	Michigan %
Population 3 years and over enrolled in school	**12,809**	**100%**	**2,780,378**	**100%**
Nursery school, preschool	729	5.7%	173,083	6.2%
Kindergarten	832	6.5%	149,186	5.4%
Elementary School (grades 1-8)	6,808	53.2%	1,225,217	44.1%
High School (grades 9-12)	3,086	24.1%	597,056	21.5%
College or Graduate School	1,354	10.6%	635,836	22.9%
EDUCATIONAL ATTAINMENT				
Population 25 years and over	**30,329**	**100%**	**6,415,941**	**100%**
Less than 9th grade	2,011	6.6%	299,014	4.7%
9th to 12th grade, no diploma	4,447	14.7%	765,119	11.9%
High School graduate (includes GED)	12,242	40.4%	2,010,861	31.3%
Some college, no degree	6,337	20.9%	1,496,576	23.3%
Associate degree	1,835	6.1%	448,112	7.0%
Bachelor's degree	2,332	7.7%	878,680	13.7%
Graduate or Professional Degree	1,125	3.7%	517,579	8.1%
Percent High School graduate or higher	78.7%		83.4%	
Percent bachelor's degree or higher	11.4%		21.8%	

Economic Characteristics

Current and Projected Economic Activity

Several sources were used to describe Newaygo County's current and projected economy. Newaygo County is unique in that it has both an agricultural and manufacturing economic base, and employment in the county's retail sector is increasing.

Agriculture

Agriculture is a not as much of a major player in Newaygo County's economy, ranking in the top twenty five compared to the other 83 counties in Michigan, in the Total Value of Agricultural Products Sold, Value of Livestock, Poultry, and their products, Value of Cattle and Calves, milk and other dairy products from cows, Layers 20 weeks and older, Rabbits, and corn for silage. Farming information is included in Table 28 through Table 30, Newaygo County Farming Facts.

Table 28: Newaygo County Farming Facts- Ranking
Source: 2002 Census of Agriculture County Profile

ITEM	Quantity	State Rank
Market Value of Agricultural Products Sold ($1,000)		
Total Value of Products Sold	60,868	22
Value of Crops including Nursery and greenhouse	20,763	37
Value of Livestock, poultry, and their products	40,105	9
Value of Sales by Commodity Group ($1,000)		
Grains, oilseeds, dry beans, and dry peas	3,977	37
Tobacco	0	0
Cotton and Cotton Seed	0	0
Vegetables, Melons, Potatoes, and sweet potatoes	8,183	10
Fruits, tree nuts, and berries	3,627	11
Nursery, greenhouse, floriculture, and sod	2,731	27
Cut Christmas Trees and short rotation woody crops	480	12
Other crops and hay	1,765	24
Poultry and eggs (Turkeys)	1,520	10
Cattle and Calves	4,723	21
Milk and other dairy products from cows	31,353	5
Sheep, goats, and their products	242	6
Horses, ponies, mules, burros, and donkeys	324	29
Aquaculture	146	4
Top Livestock inventory items		
Turkeys	(D)	5
Cattle and Calves	26,336	10
Hogs and Pigs	4,820	26
Deer	2,734	1
Horses and Ponies	2,354	15
Top Crop Items		
Forage – land used for all hay and haylage, grass silage, and	28,440	11
Corn for Grain	19,202	37
Corn for Silage	8,765	7
Soybeans	5,785	38
All Vegetables Harvested	4,941	10

Table 29: Newaygo County Farming Facts Economic Characteristics
Source: 2002 Census of Agriculture County Profile

Economic Characteristics	**Quantity**
Farms by Value of Sales	**Total**
Less than $1,000	324
$1,000 to $2,499	122
$2,500 to $4,999	87
$5,000 to $9,999	90
$10,000 to $19,999	54
$20,000 to $24,999	23
$25,000 to $39,999	41
$40,000 to 49,999	18
$50,000 to $99,999	42
$100,000 to $249,999	50
$250,000 to $499,999	21
$500,000 or more	30
Total Farm Production Expenditures ($1,000)	52,615
Average Per farm ($)	58,854
Net Cash Farm Income of Operation ($1,000)	13,203
Net Average per farm ($)	14,769

Table 30: Newaygo County Farming Facts Operator Characteristics
Source: 2002 Census of Agriculture County Profile

Operator Characteristics	**Quantity**
Principal operators by primary occupation:	**902**
Farming:	476
Other:	426
Principal Operators by Gender:	
Male	816
Female	86
Average Age of Principal Operator in Years	53
All Operators by Race	
White	1,326
Black or African American	0
American Indian or Alaska Native	7
Native Hawaiian or other Pacific Islander	0
Asian	0
More than One Race	1
All operators of Spanish, Hispanic, or Latino Origin	28

Employment Sectors and Major Employers

County Business Patterns, published by the U.S. Census Bureau, provide a snapshot view of the employment pattern within a community. As stated earlier, it is important to remember that County Business Patterns do not account for self-employed individuals, railroad employees, many governmental employees, and probably most important in Newaygo County's situation, agricultural production employees. Table 31, 2000 County Business Patterns, Newaygo County provides a snapshot view of Newaygo County's employment pattern. NAICS refers to the North American Industry Classification System.

Table 31: 2002 County Business Patterns – Newaygo County
Source: 2000 US Census Economic Characteristics

INDUSTRY	Newaygo County	Newaygo County %	Michigan	Michigan %
Agriculture, forestry, fishing and hunting, and mining	766	3.7%	49,496	1.1%
Construction	1,805	8.8%	278,079	6.0%
Manufacturing	5,609	27.3%	1,045,651	22.5%
Wholesale trade	599	2.9%	151,656	3.3%
Retail trade	2,333	11.3%	550,918	11.9%
Transportation and warehousing, and utilities	847	4.1%	191,799	4.1%
Information	285	1.4%	98,887	2.1%
Finance, insurance, real estate, and rental and leasing	763	3.7%	246,633	5.3%
Professional, scientific, management, administrative, and waste management services	1,145	5.6%	371,119	8.0%
Educational, health and social services	3,713	18.1%	921,395	19.9%
Arts, entertainment, recreation, accommodation and food services	1,172	5.7%	351,229	7.6%
Other services (except public administration)	864	4.2%	212,868	4.6%
Public administration	668	3.2%	167,731	3.6%

Table 32: 2002 County Business Patterns, Newaygo County
Source: 2002 Economic Census

NAICS Code	Industry Description	Number of Establishments	Sales or Revenue ($1,000)	Number of Employees	Annual Payroll ($1,000)
31-33	Manufacturing	39	361,145	1,428	42,973
44-45	Retail Trade	166	314,142	1,551	30,485
51	Information	14	N	137	2,051
53	Real Estate& Rental & Leasing	23	8,303	89	2,153
54	Professional, Scientific, & Tech	48	D	D	E
56	Administrative & Support & W.M.	35	7,359	149	3,089
61	Educational Services	1	D	D	A
62	Health Care and Social Assistance	78	82,399	1,377	36,094
71	Arts, Entertainment, and Recreation	12	3,643	34	927
72	Accommodation and Food Services	71	30,230	1,019	8,097
81	Other Services Except Public Admin	74	24,029	268	4,921
	Total	**561**	**831,250**	**6,052**	**130,790**

Major Employers

Newaygo County has limited major employers throughout the county. All major employers are located within the Cities of Fremont, Grant, Newaygo, and White Cloud. A majority of the employers within the county are under 100 employees.

Table 33, Newaygo County Employers with Over 100 Employees
Source: Newaygo County Economic Alliance

Company	Location	Approximate # Of Employees	Product/Service
Gerber Products Company	Fremont	660	**Baby Food**
Dura Automotive Systems, Inc	Fremont	535	Metal Stampings and Assemblies
Maga Donnelly Corporation	Newaygo	505	Automotive doors and mirrors
Gerber Health Services	Fremont	470	Health Care Services
Fremont Public Schools	Fremont	335	School/Education
Grant Public Schools	Grant	300	School/Education
WM Bolthouse Farms	Grant	250	Vegetables (Seasonal Employment)
White Cloud Public Schools	White Cloud	205	School/Education
Newaygo Public Schools	Newaygo	200	School/Education
County of Newaygo	White Cloud	200	County Government
Wal-Mart	Fremont	195	Retail Department Store
Hesperia Public School	Hesperia	170	School/Education
North American Refractory	White Cloud	125	Refractory Products/Furnace Linings
Valspar (Lilly) Industries, Inc	Fremont	125	Lubricants and Oil Additives
Gerber Life Insurance Company	Fremont	115	Life Insurance

Unemployment Data

Newaygo County has historically experienced a higher unemployment rate than the State of Michigan. These facts are illustrated in Table 34, Newaygo County Employment Statistics, 1999-2008.

Table 34: Newaygo County Employment Statistics, 1999-2009
Sources: Michigan Department of Energy, Labor, and Economic Growth, Labor Market Information Data Explorer

Unemployment Rate	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Newaygo County	6.4%	4.6%	6.1%	7.9%	8.8%	7.9%	7.4%	7.1%	7.7%	9.0%	13.8%
Michigan	3.8%	3.7%	5.2%	6.2%	7.1%	7.1%	6.8%	6.9%	7.1%	8.3%	13.6%

Socio-Economic Levels

Socio-Economic statistics such as median household income, per capita income, and the number of individuals living below poverty level all indicate that Newaygo County closely resembles the State of Michigan. In 1999, Newaygo County's Median Household Income was $37,130, which is slightly lower than Michigan's Median Household Income of $44,667. The County does have a significantly lower per capita income than the State. The percentage of residents below the poverty level in the County, 9.0% is much slightly than Michigan's rate of 10.3%. Table 35, Socio-Economic Levels provides both Newaygo County data, and for comparison purposes, data for the State of Michigan as a whole.

Table 35: Socio-Economic Levels, Newaygo County and Michigan
Source: 2000 U.S. Census

INCOME IN 1999	Newaygo	Newaygo	Michigan	Michigan
Households	**17,639**	**100%**	**3,788,780**	**100%**
Less than $10,000	1,635	9.3%	313,905	8.3%
$10,000 to $14,999	1,396	7.9%	219,133	5.8%
$15,000 to $24,999	2,589	14.7%	469,100	12.4%
$25,000 to $34,999	2,856	14.7%	470,419	12.4%
$35,000 to $49,999	3,489	19.8%	624,326	16.5%
$50,000 to $74,999	3,597	20.4%	778,755	20.6%
$75,000 to $99,999	1,510	8.6%	432,681	11.4%
$100,000 to $149,999	583	3.3%	324,966	8.6%
$150,000 to $199,999	126	.07%	79,291	2.1%
$200,000 or more	128	0.7%	76,204	2.0%
Median household income (dollars)	**$37,130**		**$44,667**	
Per Capita Income	**$16,976**		**$22,168**	
Individuals Below Poverty Level	**1,166**	**9.0%**	**1,021,605**	**10.50%**

SECTION FOUR – BACKGROUND AND HISTORY OF FIRE AND FIRE RISKS IN NEWAYGO COUNTY

History of Fire Occurrence and Community Impacts

Sixty-one percent of Newaygo County's 537 thousand acres of land is forested (MSU Extension 2006). Of this 62% is in private ownership, almost all owned by small, non-industrial owners. Of the 38% in public ownership, the vast majority is part of the Manistee National Forest managed by the US Forest Service. Oak-hickory, beech-maple and lowland hardwoods make up 79% of the forestland in the county. Pine types (white, red and jack) are predominant on 15% of the forested acreage.

The forests of northern Michigan are rich in history. In the late 1800s logging was at its peak and these forests were quickly cut and cleared. In 1909, the Huron National Forest was established and the Manistee National Forest was formed in 1938. In 1945, these two National Forests were administratively combined. Working hand in hand with the Michigan Department of Natural Resources and other partners, the Forest Service has changed the "lands that nobody wanted" to healthy forests again.

The Huron-Manistee National Forest strives to maintain an excellent fire management program. Working with local volunteer fire departments, the Michigan Department of Natural Resources and other National Forests, Forest Fire Crews work hard at suppressing wildfires. But fire suppression is only one part of Forest Service fire management. In coordination with local communities' forest fire personnel have used the FireWise program, educating homeowners on how to protect their homes from urban interface fires. Forest employees also work with media on updating the public about current fires, burn permits, and any burning bans that may be in effect.

The threat of wildfire is key challenge of spring, especially in the northern part of the county where the vegetation (red, white and jack pine and oak) is on dry, sandy sites. There is danger prior to and at the beginning of spring green up. Recreation areas are in direct contact with vegetation and need to be especially careful with sources of ignition such as cigarettes, motorized recreational equipment and campfires.

In the spring of 1994 A Type I Incident Management Team was mobilized from the United States Forest Services for the County Line Fire on the Huron-Manistee National Forest on 24 April. This fire started on the border of Lake and Newaygo Counties and threatened the community of Baldwin, Michigan. The fire burned eight mobile homes before being controlled at 330 ha (820 acres).

General Fire Behavior Expected

The following data came from the Fuels Management Specialist with the Huron Manistee National Forest.

The types of wildfire behavior of greatest concern in Newaygo County are crown fires and high-intensity surface fires. Crown fires are characterized by sustained burning through the forest canopy, often independent of a surface fire. Crown fires burn primarily the needles and small branches of trees. Crown fires are able to move very swiftly, spot long distances, and release large amounts of heat energy, and therefore are very difficult to control.

High-intensity surface fires are different from a crown fire in that the greatest amount of burning is taking place on the forest floor and lower shrub layers, with occasional torching of individual or small clumps of trees. Like crown fires, high-intensity surface fires have the potential to move swiftly, spot long distances, and release large amounts of heat energy. However, since the heat energy comes primarily from larger surface fuels spread across the forest floor, this energy is spread over a wider area and is sustained for a longer period of time. This type of surface fire is also very difficult to control.

The forest types of greatest concern in Newaygo County are: jack pine, Scotch pine, jack pine-oak, red pine, and oak. The forest types are listed with the most hazardous type first and so on to the least hazardous of the species of concern. The jack pine-dominated stands have the greatest potential for high-intensity wildfire, and are considered one of the most volatile fuel types occurring in the United States or Canada.

These different types of stands reflect a specific historical fire regime and a general description of fuel loading and arrangement.

The current vegetation in the county is characterized by one of three natural (historic) fire regimes:

- Fire regime 1 is represented by jack and Scotch pine stands. This fire regime is characterized by frequent (0-35 years) stand-replacing fires. Historically, this fire regime would have been critical in the maintenance of jack pine stands, openings, and barrens.

- Fire regime 2 is represented by red pine stands, especially those with contiguous crowns and which are adjacent to jack pine stands. This fire regime is characterized by relatively frequent stand-replacing fires (e.g. 0-50 years) where most trees are killed.

- Fire regime 4 is represented by oak and jack pine-oak stands. This fire regime is characterized by less frequent mixed intensity ground maintenance fires (e.g. 50-100 years) where there is a mosaic of different ages of forested stands and openings.

The current vegetation in the county is characterized by one of three fuel models:

Fuel Model 4 – Fire intensity and fast-spreading fires involve the foliage and live and dead fine woody material in the crowns of a nearly continuous secondary overstory. Stands of mature shrubs, 6 or more feet tall, such as California mixed chaparral, the high pocosin along the east coast, the pine barrens of New Jersey, or the closed jack pine stands of the north-central states are typical candidates. Besides flammable foliage, dead woody material in the stands contributes to the fire intensity. Height of stands qualifying for this model depends on local conditions. A deep litter layer may also hamper suppression efforts. Fuel loading is typically 16.03 tons per acre.

In Newaygo County, fuel model 4 is represented by jack and Scotch pine stands.

Fuel Model 9 – Fires run through the surface quickly and have long flame heights. Both long-needle conifer stands and hardwood stands, especially the oak-hickory types, are typical. Fall fires in hardwoods are predictable, but high winds can actually cause higher rates of spread than predicted because of spotting caused by rolling and blowing leaves. Closed stands of long-needled pine like ponderosa, Jeffrey, and red pines, or southern pine plantations are grouped in this model. Concentrations of dead-down woody material will contribute to possible torching out of trees, spotting, and crowning. Fuel loading is typically 3.48 tons per acre.

In Newaygo County, fuel model 9 is represented by red pine and hardwood-dominated stands.

Fuel Model 10 – The fires burn in the surface and ground fuels with greater fire intensity than the other timber litter models. Dead-down fuels include greater quantities of 3-inch or larger limb wood resulting from overmaturity or natural events that create a large load of dead material on the forest floor. Crowning out, spotting, and torching of individual trees is more frequent in this fuel situation, leading to potential fire control difficulties. Any forest type may be considered if heavy down material is present; examples are insect or disease-ridden stands, windthrown stands, overmature situations with deadfall, and aged light thinning or partial-cut slash. Fuel loading is typically 12.02 tons per acre.

In Newaygo County, fuel model 10 is represented by jack pine-oak stands.

While total fuel loading is an important factor affecting fire behavior, the fuel category that contributes the greatest to high-intensity crown fires is the live component. It is fuel model 4

and 10, represented by jack pine and jack pine-dominated stands respectively, which have a large amount of their fuel source in the needles of living trees, as well as overall fuel loading. The smaller fuels, especially the less than one-quarter inch and the one-quarter inch to one inch, contribute to surface fire intensity. High fuel loading in these smaller categories can cause a light to moderate-intensity surface fire to trigger a high-intensity crown fire.

It is the nature of jack pine-dominated stands to regenerate one of two ways: either totally following a stand-replacing disturbance, or incrementally with die off of individual trees. As die off continues dead wood is deposited on the forest floor increasing fuel loadings at the same time young jack pine is growing up through the canopy creating ladder fuels that can transport a ground fire to the canopy. While the life span of jack pine can be as high as 150 years, the species matures in 60 years and subsequently begins to deteriorate, especially on poor growing sites. As these stands become overmature (>60 years old), the buildup of volatile surface and sub-canopy fuels will increase dramatically. Therefore, as the threat of a crown fire continues with the death of the mature jack pine, there will also be an accompanying increase in the surface fuels that can cause high-intensity surface fires.

The fuel loading situation would be similar in the red pine stands. Presently, there is a high loading of potentially volatile live aerial fuels in the red pine stands that could contribute to a high-intensity crown fire. At the same time, the amount of dead surface fuels on the floor of these red pine stands is relatively small. However, if these red pine stands are left untreated and begin to succumb to increased competition from overcrowding, the fuel loading of the dead surface fuels would likely increase.

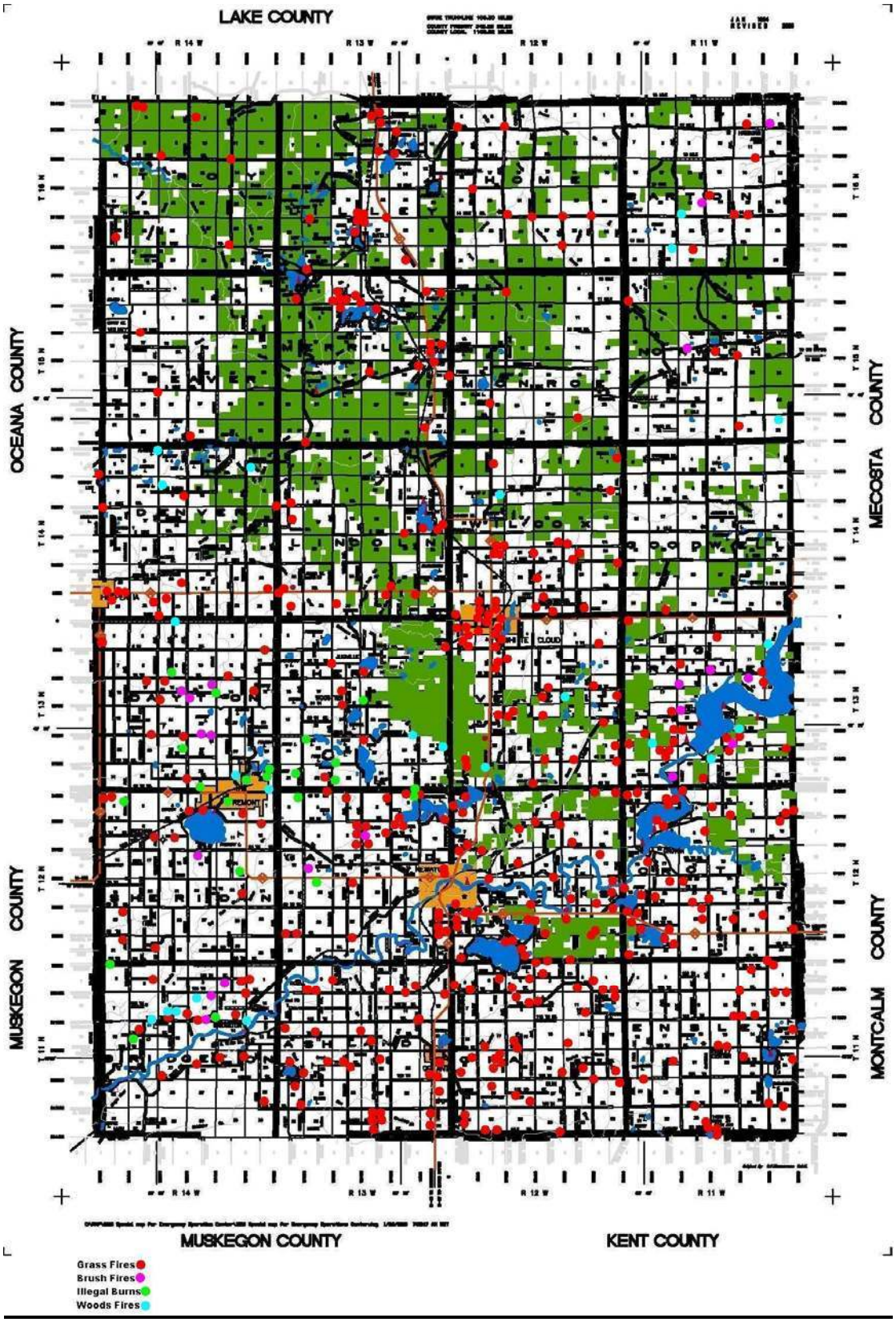
Intensity and rates of spread would be weather-dependent on any given fire day. On a day with a moderate to high fire danger, only indirect attack could be attempted safely by fire suppression forces, and running crown fires could happen when low fuel moisture occurs. Firefighter safety and property would be especially in danger from running crown fires during the spring season when weather and low fuel moistures provide the greatest likelihood of extreme fire behavior.

History of Wildland Fire Occurrence for Newaygo County

(Grass, Woods, and Illegal Burn Fire Starts)

Township	Fire Dept	2005	2006	2007	2008	2009	NFS	Total
Ashland	Station 13 – Grant Fire	10	4	5	11	5	0	**35**
Barton	Big Rapids City Fire	3	2	1	1	3	5	**15**
Beaver	Station 19 – Hesperia Fire	1	0	0	0	0	12	**14**
	Walkerville Fire	0	0	1	0	0		
Big Prairie	Station 15 – Big Prairie Fire	5	9	0	7	10	14	**45**
Bridgeton	Station 11 – Fremont Fire	4	3	2	5	5	0	**22**
	Station 13 - Grant Fire	1	1	1	0	1		
Brooks	Station 12 – Newaygo Fire	11	9	7	7	9	21	**64**
Croton	Station 14 – Croton Fire	5	9	6	9	12	22	**63**
Dayton	Station 11 – Fremont Fire	6	3	3	4	6	1	**26**
	Station 19 – Hesperia Fire	1	0	0	2	0		
Denver	Station 19 – Hesperia Fire	5	4	0	4	3	8	**24**
Ensley	Sand Lake Fire	6	9	4	2	5	1	**27**
Everett	Station 18 – White Cloud Fire	5	10	3	7	8	23	**56**
Garfield	Station 11 –Fremont Fire	3	2	3	2	1	6	**34**
	Station 12 – Newaygo Fire	8	2	4	1	2		
Goodwell	Station 15 – Big Prairie Fire	1	0	0	0	0	9	**10**
Grant	Station 13 – Grant Fire	12	7	7	6	10	3	**45**
Home	Station 17 – Lilley Fire	1	0	3	1	1	17	**23**
Lilley	Station 17 – Lilley Fire	1	5	1	4	3	32	**46**
Lincoln	Station 18 – White Cloud Fire	6	1	4	2	1	25	**39**
Merrill	Station 17 – Lilley Fire	5	3	0	4	6	33	**51**
Monroe	Station 17 – Lilley Fire	1	0	0	0	1	16	**18**
Norwich	Big Rapids City Fire	0	3	1	1	2	20	**27**
Sheridan	Station 11 – Fremont Fire	3	3	3	2	6	0	**17**
Sherman	Station 11 – Fremont Fire	4	1	3	5	5	24	**45**
	Station 18 – White Cloud Fire	0	1	0	1	1		
Troy	Walkerville Fire	3	4	0	0	0	19	**28**
	Station 17 – Lilley Fire	0	0	0	0	2		
Wilcox	Station 18 – White Cloud Fire	16	10	2	3	5	29	**65**

Map of Fire Starts in Newaygo County 2005 - 2009



SECTION FIVE – NEWAYGO COUNTY WILDLAND URBAN INTERFACE BOUNDARIES

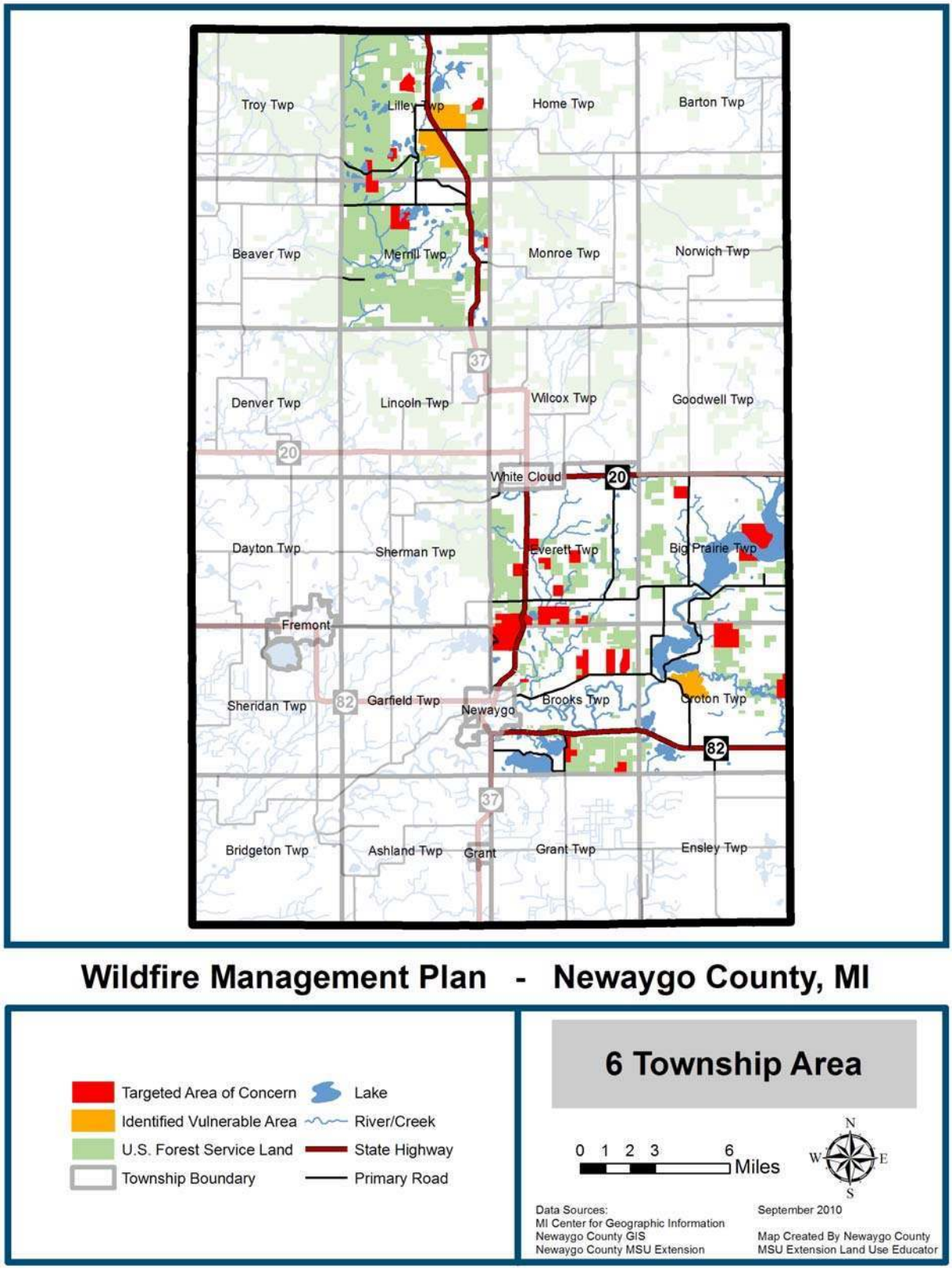
Newaygo County Wildland Urban Interface areas (WUI)

When developing the community risk assessment, the Community Wildfire Protection Planning Workgroup utilized 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.

The RAMS model subdivides Newaygo County into two “planning compartments”, north and south. The planning compartments were then broken down into twenty-four 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.

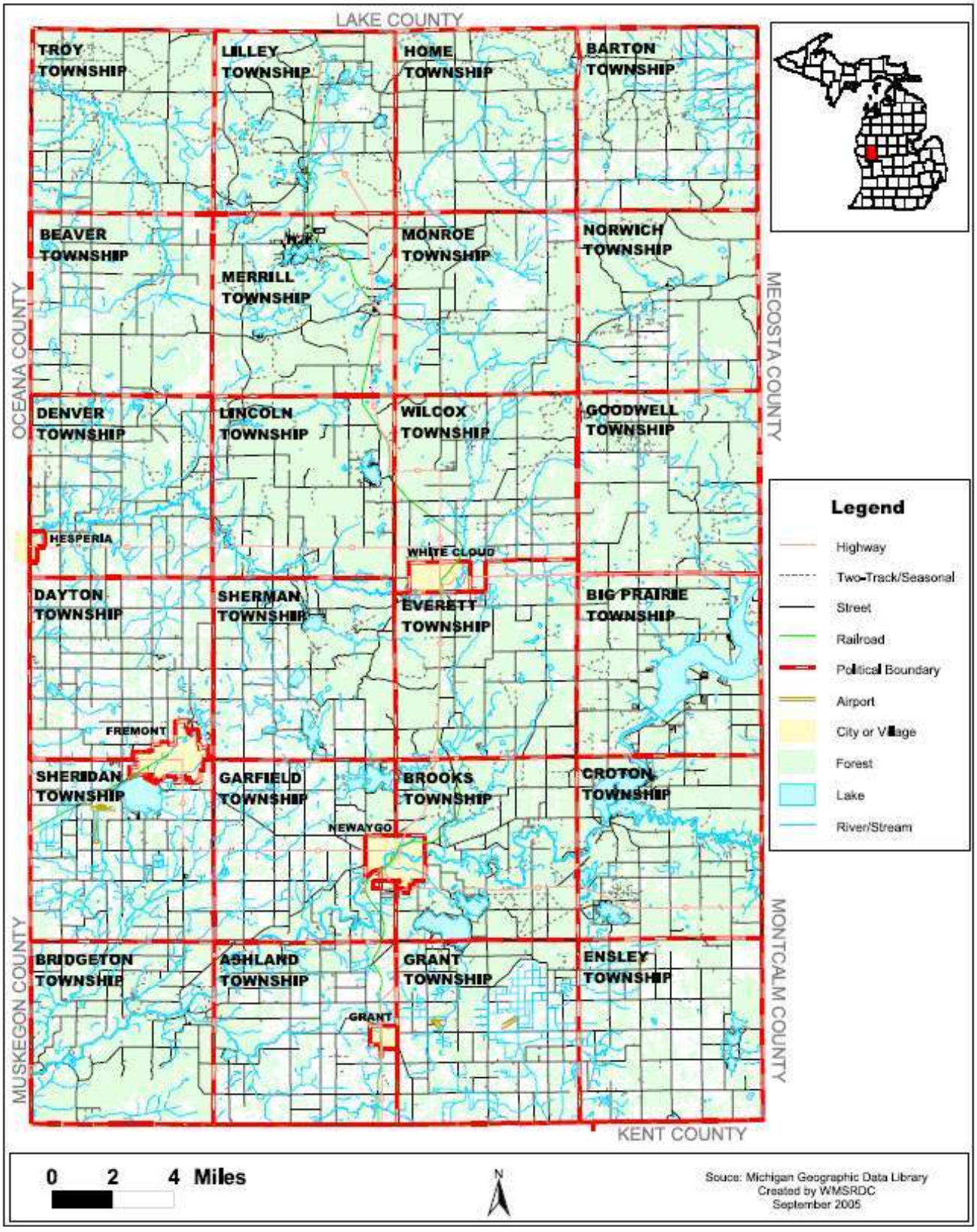
When determining the Wildland Urban Interface (WUI) communities, the Community Wildfire Protection Planning Workgroup reviewed the RAMS data reports, population, population density, historical fire starts, and the fire fuels potential. After careful consideration, the Community Wildfire Protection Planning 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 Newaygo County Wildland Fire Protection Plan. Projects can overlap between Wildland Urban Interface (WUI) communities and cross different jurisdictions where agreements are in place. The map below shows Newaygo Counties’ six Wildland Urban Interface (WUI) areas and boundaries. Detailed descriptions of each Wildland Urban Interface community can be found starting on page 93.

Newaygo County Wildland Urban Interface areas (WUI) Map



MAP 1

NEWAYGO COUNTY
Base Map



Newaygo County Communities and Neighborhoods

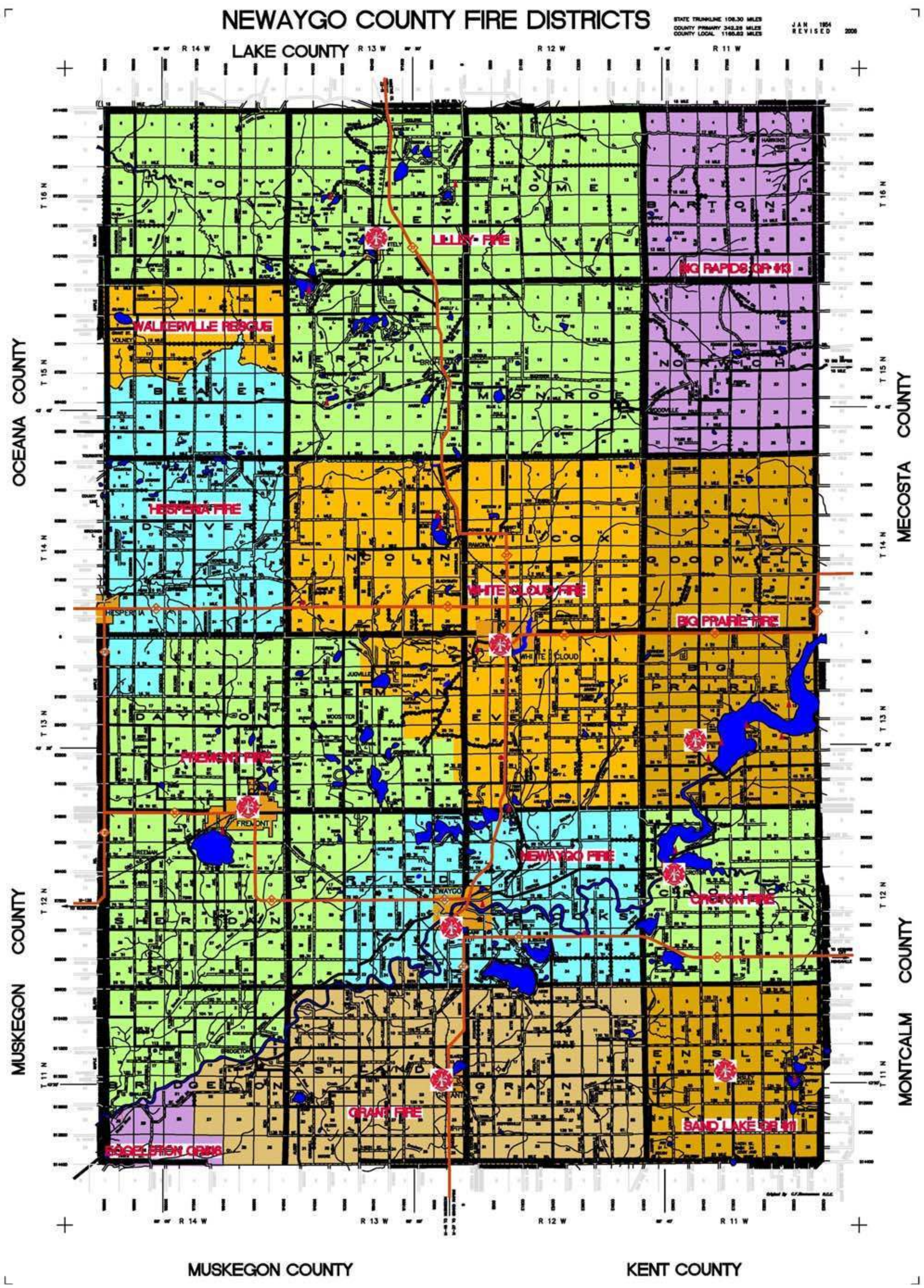
The Newaygo County Community Wildfire Protection Plan (CWPP) offers a variety of benefits to communities at risk from wildland fire. Within Newaygo County, six Wildland Urban Interface (WUI) areas have been identified. Each area has its own set of unique circumstances and need for mitigating measures. Each of Wildland Urban Interface areas (WUI) were assessed and documentation for each of the Wildland Urban Interface areas (WUI) can be found starting on page 93.

One significant benefit for Newaygo 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 Newaygo 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

Newaygo County Fire Department Service Area

All of Newaygo County's 24 Townships are provided fire protection services by a local volunteer fire department. Almost all of the fire departments cover more than one township. Below is a map of the twelve Fire Department Service Areas in Newaygo County.


NEWAYGO COUNTY FIRE DISTRICTS
LAKE COUNTY
R 14 W
R 13 W
R 12 W
R 11 W
OCEANA COUNTY
MUSKEGON COUNTY
MECOSTA COUNTY
MONTCALM COUNTY
MUSKEGON COUNTY
KENT COUNTY
LILLEY FIRE
WALKERVILLE RESCUE
HESPERIA FIRE
WHITE CLOUD FIRE
BIG PRAIRIE FIRE
FREMONT FIRE
NEWAYGO FIRE
CROTON FIRE
GRANT FIRE
HESPERIA
WHITE CLOUD
FREMONT
NEWAYGO

SECTION SIX – DESCRIPTIONS OF WILDLAND URBAN INTERFACE AREAS (WUI)

BIG PRAIRIE TOWNSHIP

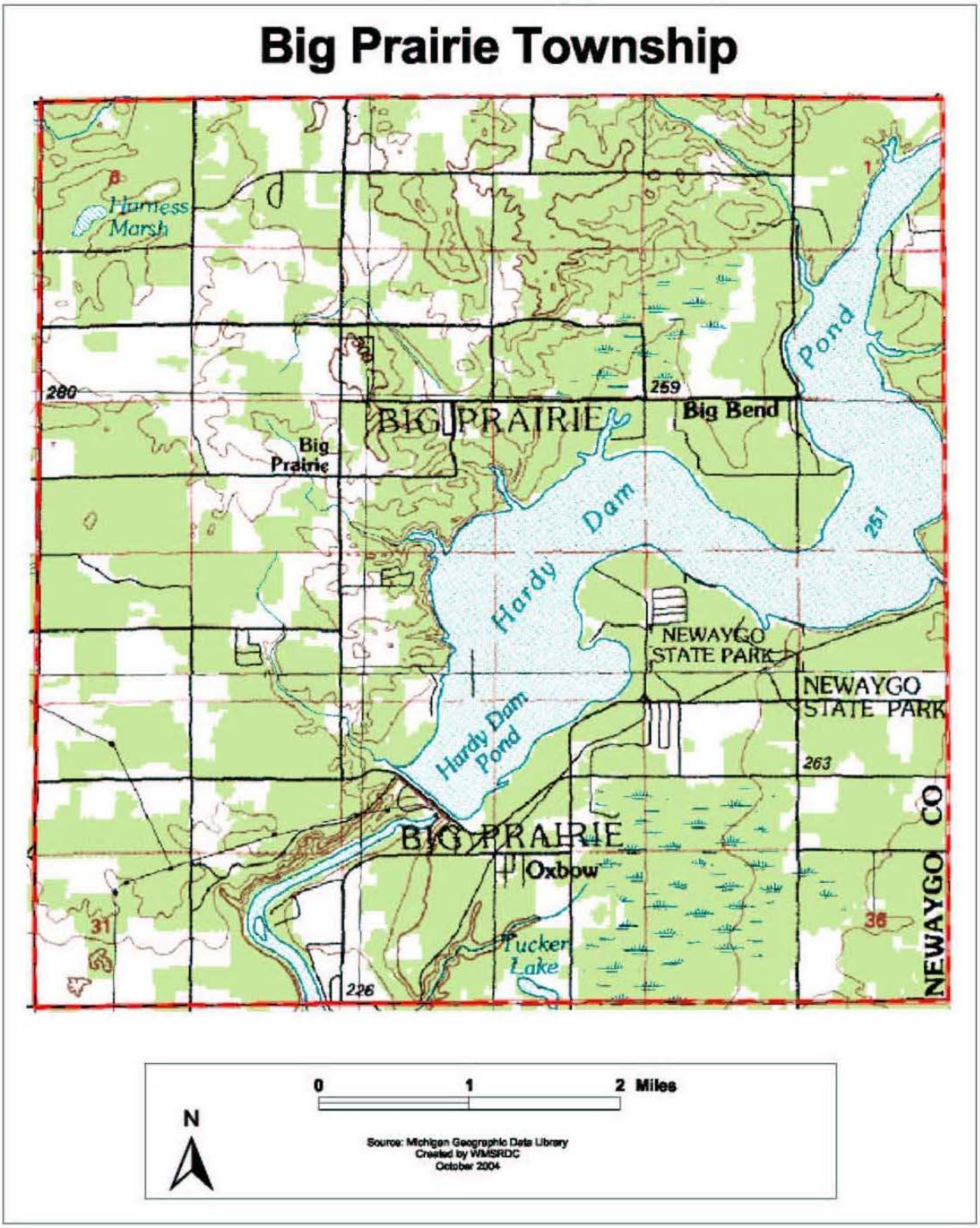
1.	**major geographic features:**	- Muskegon River - Hardy Dam Pond, 2 small lakes - Dense forest (Manistee National Forest), widely scattered agriculture, and isolated urban development around Hardy Dam Pond - 78.2 people per square mile of land area - 46.8 housing units per square mile of land area
2.	**Population Concentrations** (including special facilities)	
a.	**group homes:**	- None Identified
b.	**large apartment buildings:**	- None Identified
c.	**schools:**	- None Identified
d.	**large office buildings:**	- None Identified
e.	**other** (such as stadiums, concert halls, amusement parks, fairgrounds, correctional facilities, nursing homes, other special populations or large crowd assembly areas):	- Hardy Dam Ramp County Park - Oxbow Township Park, 2973 Cottonwood (campground, 179 sites) - Big Bend Township Park, 2000 South Beech Ave (campground, 239 sites) - Newaygo State Park, 2793 Beech Ave (99 campsites) - The Trout Club, 1695 East 40th St (campground) - Sandy Beach Campground, 6926 30thSt(220 sites) - Sportsman Park Campground & Boat Slips, 2500 Sportsman Dr
f.	**major employers:**	- None Identified
3.	**Population Shifts** (location; time, date or season of shift; extent of shift)	
a.	**daily:**	- 626 attend school, 928 commute to work with an average commuting time of 43.8 minutes
b.	**weekly:**	N/A
c.	**seasonal:**	- 1,474 total housing units: 980 occupied/ 494 vacant; of the 494 vacant, 432 are for seasonal, recreational, or occasional use
4.	**Important or Critical Public and Private Facilities**	
a.	**police precincts:**	- None Identified
b.	**fire stations:**	- Big Prairie Township Fire Department, 2815 S Elm Ave
c.	**public works yards:**	- None Identified
d.	**pumping stations:**	- None Identified
e.	**community shelters:**	- None Identified
f.	**community medical facilities:**	- None Identified
g.	**other** (describe – i.e., government buildings, record center, major construction companies, warehouses, demolition companies, heavy equipment rental, emergency	- Township of Big Prairie, 2815 S Elm Ave

	equipment and vehicle storage, etc)		
5.	**Vital or Critical Infrastructure**		
a.	**roads, railroads, and bridges:**	- M-20	
b.	**dams, power stations, water treatment plants, sanitary lift stations, etc.:**	- Hardy Dam - Hardy Hydroelectric Plant, 6928 East 36th St - Consumers Energy Power Line	
c.	**other** (describe – i.e. airports, pipelines, bus terminals, train stations, military bases, marine passenger ferry services, etc.):	- Hardy Dam Marina, 6619 36th Street (37 slips)	
6.	**Socio-Economic Profile of Sector**		
a.	**total population (day):**	1,088 (estimate)	
b.	**total population (night):**	2,465	
c.	**peak population (seasonal):**	3,749	
d.	**percent over 65:**	13	
e.	**percent under 18:**	26.6	
f.	**percent below poverty level:**	12.2	
g.	**percent with disability or mobility limitation:**	28.2	
h.	**estimated property insurance coverage**(Real Equalized Valuations):	Personal: Agricultural: Commercial: Industrial: Residential: Total:	$1,714,000 $0 $1,401,200 $15,622,500 $38,791,900 $67,529,600
i.	**flood insurance coverage:**	Total Losses since 01/01/78: Total Payments since 01/01/78: Policies In-Force: Total Insurance In-Force:	Not participating in flood insurance program
j.	**Location of flood plains:**	*Flood Hazard Areas – Not in Flood Insurance Program:* - flood plain along Muskegon River - flood plain around Hardy Dam Pond and adjacent creeks	
k.	**percent that are homeowners:**	85.4	
7.	**Emergency Warning System Coverage**		
a.	**siren locations and/or description of warning system:**	- Consumers Energy siren/speaker locations: 36th St. at Hardy Dam Parking Lot (Consumers Energy property); near intersection of 44th St. and River St. - Fire Siren and Tornado Siren at Big Prairie Township Fire Department (on-site activation)	
b.	**percent of population covered by warning sirens or system:**	- One mile radius for warning sirens - ¾ mile radius at a 70-decible level and 1 ½ mile radius at a 60-decibel level for the Consumers Energy sirens	

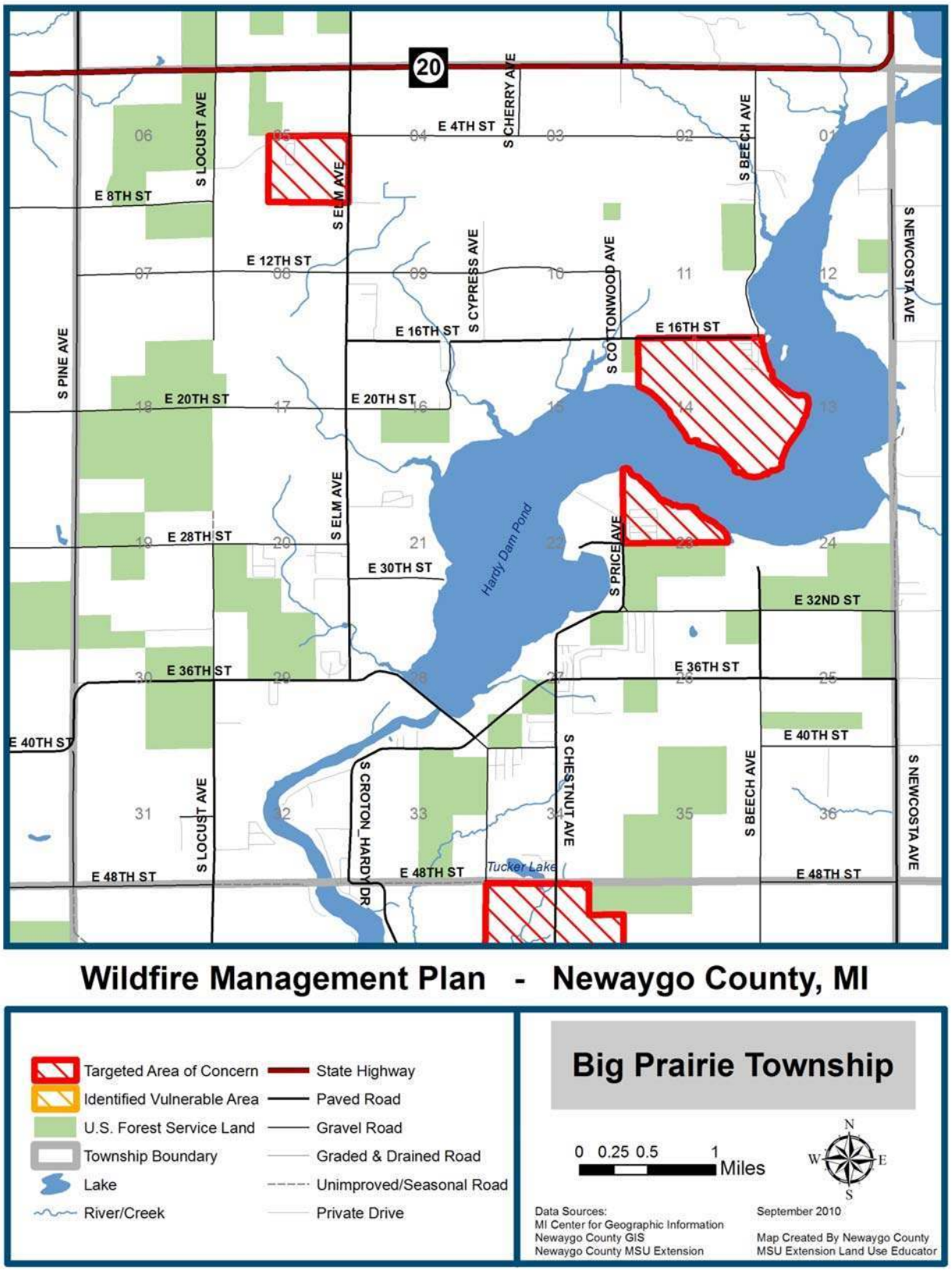
Wildland Urban Interface area (WUI) - Big Prairie Township *(20,160 Acres)*		
Fuels	HIGH	Flame Length 8 + Feet
Crowning Potential	HIGH	6 + Feet
Slope Percent	LOW	0 – 20%
Aspect	LOW	North, Northwest or Northeast
Elevation	HIGH	0 – 3500 feet
Initial Attack	LOW	0 – 20 Minutes
Suppression Capability	MODERATE	Reasonable access, some fuel problems, some barriers, no structures
Population Density	78 per Miles²	1,474 Housing Structures, Total population 2,465 people
Private Property	MODERATE	Threat to structures and property
Recreation	HIGH	Developed recreation site within or adjacent to area (5+ Campgrounds within the township)
Wildlife/Fisheries	HIGH	Highly Significant Habitat
Watershed	HIGH	Stream Class PI, I. Important water use/riparian area. Domestic water use. MUSKEGON WATERSHED
Forest/Woodland	HIGH	Standing timber / woodland on 51+% of area
Cultural Resources	MODERATE	Minimal archaeological/historical findings, potential for Native American use
Special Interest Areas	MODERATE	Area is adjacent to a Special Interest Area
Visual Resources	HIGH	Preserve and retain existing character
T&E Species	HIGH	Species Present
Soils Erosion	LOW	Low Significance EHR < 4
Airshed	MODERATE	Class 4 + 3 Airsheds moderate receptor sensitivity
Access	MODERATE	State and federal highways, county roads, and public access roads
Topography		Rolling woodlands and river valleys
Wildfire Assessment Risk	MODERATE	Catastrophic Fire Possible

Map of Big Prairie Township Wildland Urban Interface area (WUI)

Land Use and Natural Features Map (USGS Quad.)



Map of Big Prairie Township Wildland Urban Interface area (WUI)



Wildfire Management Plan - Newaygo County, MI

Targeted Area of Concern
Identified Vulnerable Area
U.S. Forest Service Land
Township Boundary
Lake
River/Creek
State Highway
Paved Road
Gravel Road
Graded & Drained Road
Unimproved/Seasonal Road
Private Drive

Big Prairie Township

0 0.25 0.5 1 Miles

N W E S

Data Sources:
MI Center for Geographic Information
Newaygo County GIS
Newaygo County MSU Extension

September 2010

Map Created By Newaygo County
MSU Extension Land Use Educator

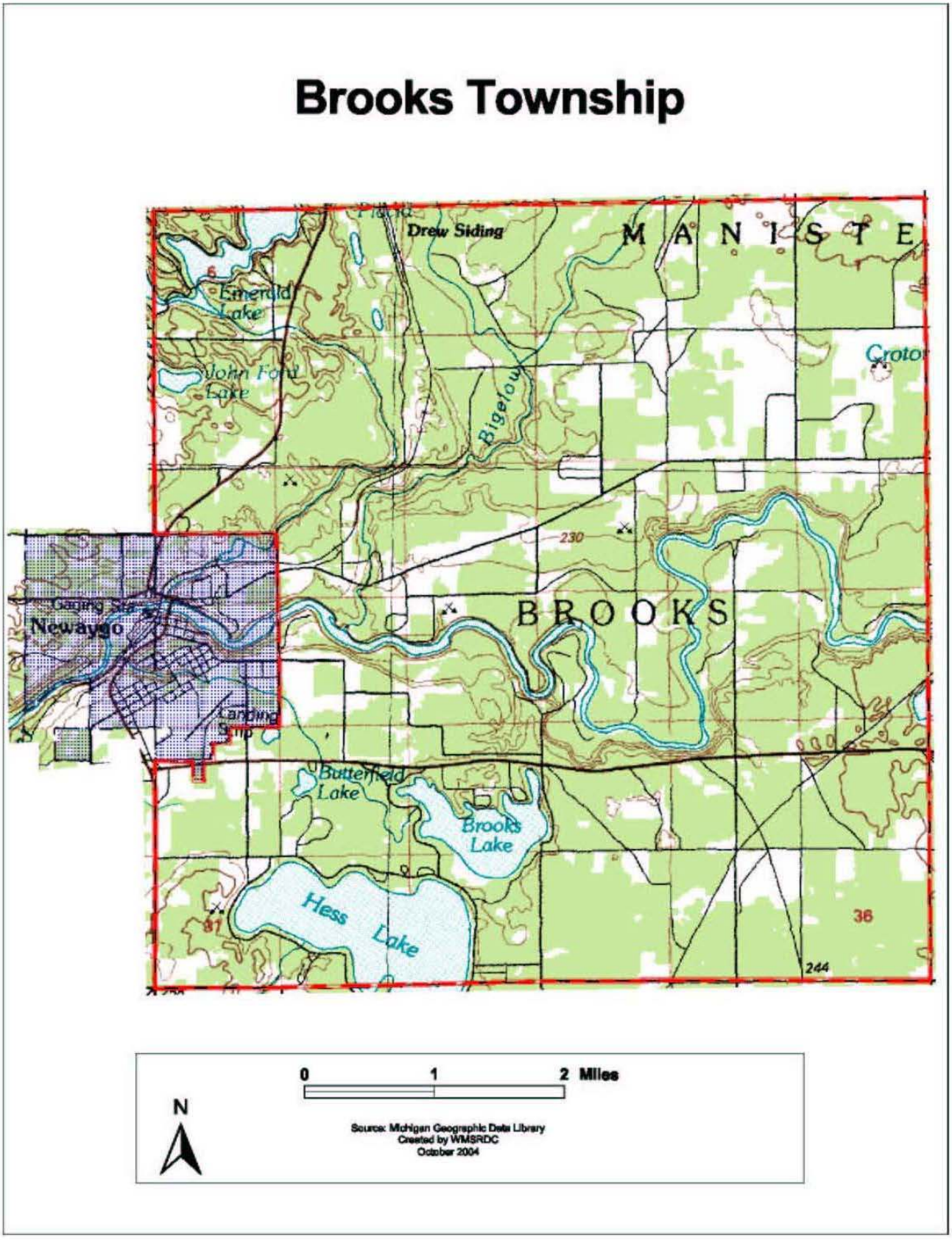
BROOKS TOWNSHIP

1.	**major geographic features:**	- Muskegon River, 4 creeks - Hess Lake, Brooks Lake, 6-8 small lakes - Dense forest (Manistee National Forest) and urban development around Hess Lake and Brooks Lake - 115.6 people per square mile of land area - 62.3 housing units per square mile of land area
2.	**Population Concentrations** (including special facilities)	
a.	**group homes:**	- None Identified
b.	**large apartment buildings:**	- Edgeview Apartments, 310 E 82nd St (36 family units)
c.	**schools:**	- Learning Center East (adult education), 941 76th St
d.	**large office buildings:**	- None Identified
e.	**other** (such as stadiums, concert halls, amusement parks, fairgrounds, correctional facilities, nursing homes, other special populations or large crowd assembly areas):	- Ed H Henning County Park, 500 E Croton Drive (60 Sites) - M-37 Motel, 8372 Mason (5 units) - Camp Calvary, 7500 Pettit Drive (capacity 96) - Brooks Lake Mobile Home Park, 2263 Spruell - Lake Forest Park Mobile Home Community, 9502 S. Second - Wieranga's Hess Lake Trailer Park, 825 East 88th Street
f.	**major employers**	- None Identified
3.	**Population Shifts** (location; time, date or season of shift; extent of shift)	
a.	**daily:**	- 861 attend school, 1,677 commute to work with an average commuting time of 36.0 minutes
b.	**weekly:**	N/A
c.	**seasonal:**	- 1,978 total housing units: 1,441 occupied/ 537 vacant; of the 537 vacant, 459 are for seasonal, recreational, or occasional use
4.	**Important or Critical Public and Private Facilities**	
a.	**police precincts:**	- None Identified
b.	**fire stations:**	- covered by Newaygo Fire District
c.	**public works yards:**	- None Identified
d.	**pumping stations:**	- None Identified
e.	**community shelters:**	- None Identified
f.	**community medical facilities, hospitals:**	- None Identified
g.	**other** (i.e., government buildings, record center, major construction companies, warehouses, demolition companies, heavy equipment rental, emergency equipment and vehicle	- Township of Brooks, 490 Quarterline Rd

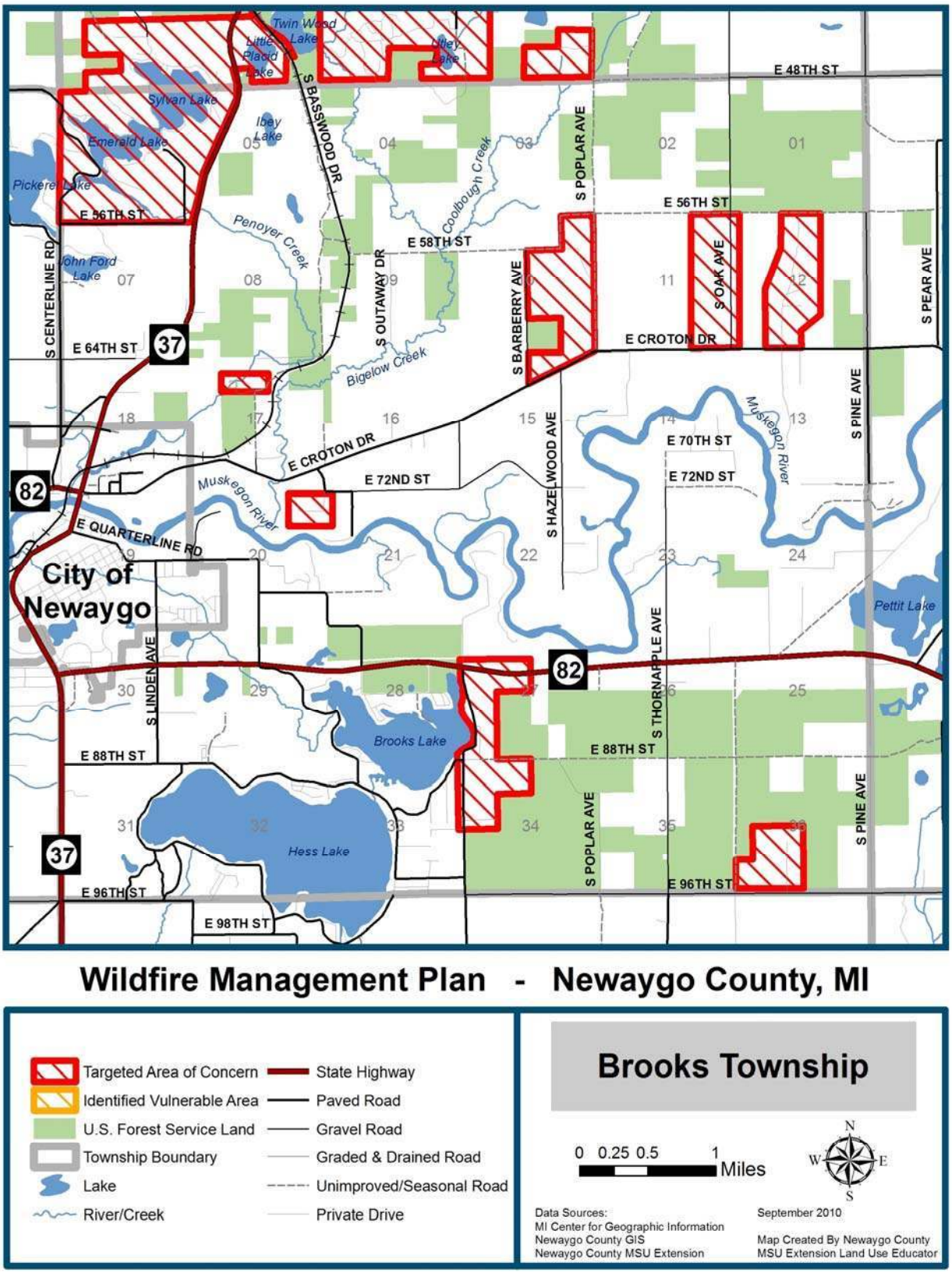
	storage, etc.):		
5.	**Vital or Critical Infrastructure**		
a.	**roads, railroads, and bridges:**	- M-37, M-82 - CSX Railroad	
b.	**dams, power stations, water treatment plants, sanitary lift stations, etc.**	- Consumers Energy Power Line - Public Sewer Service	
c.	**other** (i.e. airports, pipelines, bus terminals, train stations, military bases, marine passenger ferry services, etc.):	- MichCon Natural Gas Pipeline	
6.	**Socio-Economic Profile of Sector**		
a.	**total population (day):**	1,853 (estimate)	
b.	**total population (night):**	3,671	
c.	**peak population (seasonal):**	5,044	
d.	**percent over 65:**	14.1	
e.	**percent under 18:**	27.1	
f.	**percent below poverty level:**	11.1	
g.	**percent with disability or mobility limitation:**	15.8	
h.	**estimated property insurance coverage** (Real Equalized Valuations):	Personal Property: Agricultural: Commercial: Industrial: Residential: Total:	$2,350,000 $1,857,300 $2,568,900 $0 $131,283,900 $138,060,100
i.	**flood insurance coverage:**	Total Losses since 01/01/78: Total Payments since 01/01/78: Policies In-Force: Total Insurance In-Force:	1 $28,000.00 13 $1,407,800
j.	**location of floodplains:**	- flood plain along Muskegon River	
k.	**percent that are homeowners:**	90.1	
7.	**Emergency Warning System Coverage**		
a.	**siren locations and/or description of warning system:**	- Consumers Energy siren/speaker locations: intersection of Pettit Lake Dr. and Tanglewood St. (private property); Thornapple Ave. (county right-of-way); Spruce Ave. (county right-of-way)	
b.	**percent of population covered by warning sirens or system:**	- ¾ mile radius at a 70-decibel level and 1 ½ mile radius at a 60-decibel level	

Wildland Urban Interface area (WUI) - Brooks Township *(20,352 Acres)*		
Fuels	HIGH	Flame Length 8 + Feet
Crowning Potential	HIGH	6 + Feet
Slope Percent	LOW	0 – 20%
Aspect	LOW	North, Northwest or Northeast
Elevation	HIGH	0 – 3500 feet
Initial Attack	LOW	0 – 20 Minutes
Suppression Capability	MODERATE	Reasonable access, some fuel problems, some barriers, no structures
Population Density	115.6 per Miles^2	1,978 Housing Structures, Total population 3,671 people
Private Property	HIGH	High loss and threat potential due to numbers and placement
Recreation	HIGH	Developed recreation site within or adjacent to area
Wildlife/Fisheries	HIGH	Highly Significant Habitat
Watershed	HIGH	Stream Class PI, I. Important water use/riparian area. Domestic water use. MUSKEGON WATERSHED
Forest/Woodland	HIGH	Standing timber / woodland on 51+% of area
Cultural Resources	MODERATE	Minimal archaeological/historical findings, potential for Native American use
Special Interest Areas	MODERATE	Area is adjacent to a Special Interest Area
Visual Resources	HIGH	Preserve and retain existing character
T&E Species	HIGH	Species Present
Soils Erosion	LOW	Low Significance EHR < 4
Airshed	MODERATE	Class 4 + 3 Airsheds moderate receptor sensitivity
Access	MODERATE	State and federal highways, county roads, and public access roads
Topography		Rolling woodlands and river valleys
Wildfire Assessment Risk	HIGH	Catastrophic Fire Likely

Land Use and Natural Features Map (USGS Quad.)



Map of Brooks Township Wildland Urban Interface area (WUI)



Wildfire Management Plan - Newaygo County, MI

Targeted Area of Concern
Identified Vulnerable Area
U.S. Forest Service Land
Township Boundary
Lake
River/Creek
State Highway
Paved Road
Gravel Road
Graded & Drained Road
Unimproved/Seasonal Road
Private Drive

Brooks Township

0 0.25 0.5 1 Miles

N W E S

Data Sources:
MI Center for Geographic Information
Newaygo County GIS
Newaygo County MSU Extension

September 2010

Map Created By Newaygo County
MSU Extension Land Use Educator

CROTON TOWNSHIP

1.	**major geographic features:**	- Croton Dam Pond, Little Muskegon River Pond, Bill's Lake, Pettit Lake - Muskegon River, Little Muskegon River, 2 creeks - Dense forest (Manistee National Forest), small area of agriculture, and urban development around Bill's Lake and Croton Dam Pond - 89.4 people per square mile of land area - 49.8 housing units per square mile of land area
2.	**Population Concentrations** (including special facilities)	
a.	**group homes:**	- None Identified
b.	**large apartment buildings:**	- None Identified
c.	**schools:**	- None Identified
d.	**large office buildings:**	- None Identified
e.	**other** (such as stadiums, concert halls, amusement parks, fairgrounds, correctional facilities, nursing homes, other special populations or large crowd assembly areas):	- Croton Township Campground, 5725 Croton Hardy Drive (157 sites) - Riverside Resort, 5757 Division (10 units) - Frank's Alpine Resort, 5724 Croton Hardy Drive - VFW Children's Camp, 5566 East 86th (capacity 88) - Croton Day Care Center, 5764 Division (capacity 139)
f.	**major employers:**	- None Identified
3.	**Population Shifts** (location; time, date or season of shift; extent of shift)	
a.	**daily:**	- 730 attend school, 1,291 commute to work with an average commuting time of 36.1 minutes
b.	**weekly:**	N/A
c.	**seasonal:**	- 1,696 total housing units: 1,222 occupied/ 474 vacant; of the 474 vacant, 390 are for seasonal, recreational, or occasional use
4.	**Important or Critical Public and Private Facilities**	
a.	**police precincts:**	- None Identified
b.	**fire stations:**	- Croton Township Fire Department, 6464 S Croton Hardy Drive
c.	**public works yards:**	- None Identified
d.	**pumping stations:**	- None Identified
e.	**community shelters:**	- None Identified
f.	**community medical facilities, hospitals:**	- None Identified
g.	**other** (i.e., government buildings, record center, major construction companies, warehouses, demolition companies, heavy equipment rental, emergency equipment and vehicle storage, etc.):	- Township of Croton, 5833 E Division St - Croton Public Library, 6464 Croton Hardy Drive

5.	Vital or Critical Infrastructure		
a.	**roads, railroads, and bridges:**	- M-82	
b.	**dams, power stations, water treatment plants, sanitary lift stations, etc.:**	- Croton Dam - Croton Hydroelectric Dam, Croton Dam Rd - Consumers Energy Power Line	
c.	**other** (i.e. airports, pipelines, bus terminals, train stations, military bases, marine passenger ferry services, etc.):	- MichCon Natural Gas Pipeline	

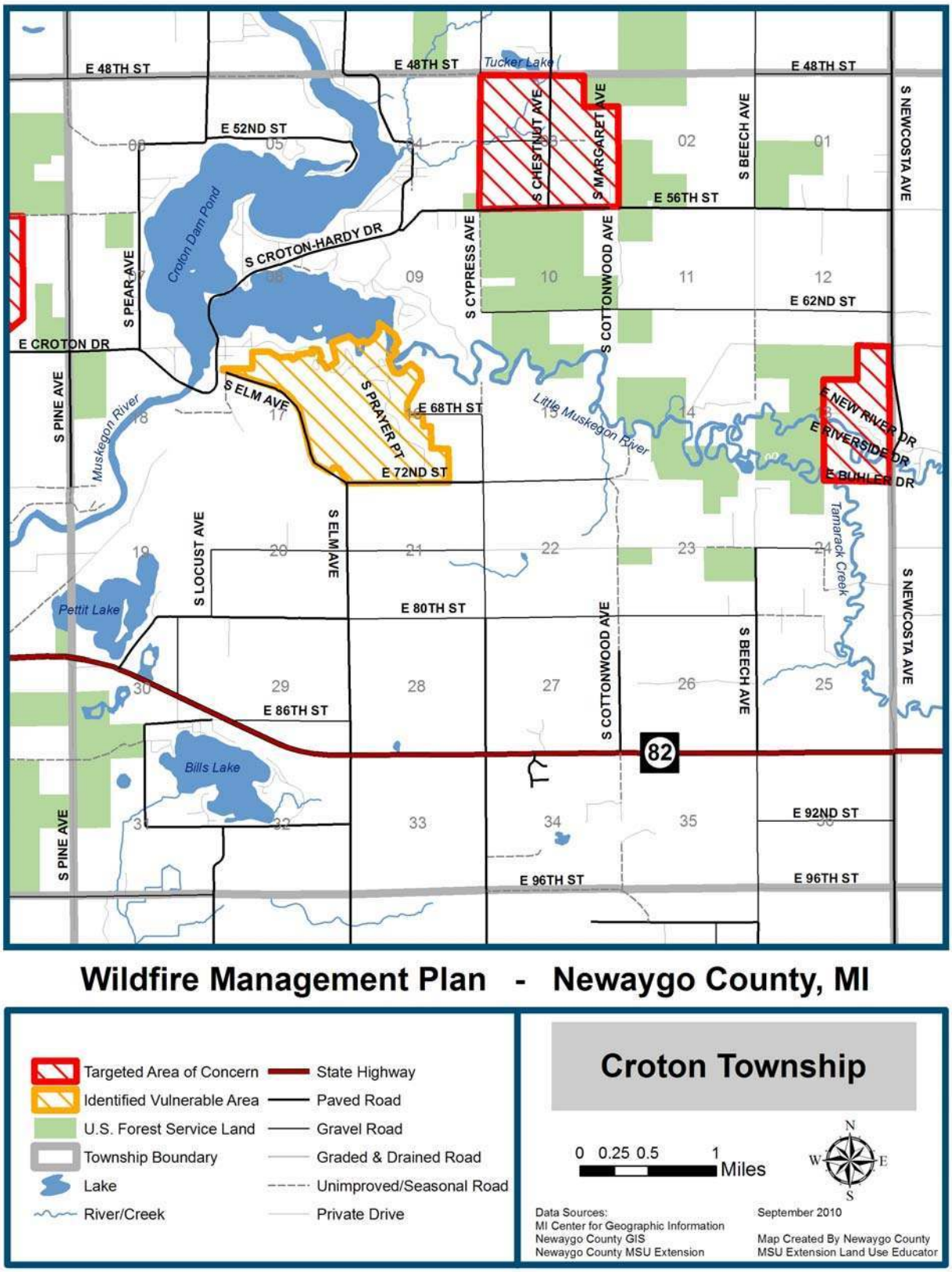
6.	Socio-Economic Profile of Sector		
a.	**total population (day):**	1,587 (estimate)	
b.	**total population (night):**	3,042	
c.	**peak population (seasonal):**	4,189	
d.	**percent over 65:**	14.5	
e.	**percent under 18:**	25.2	
f.	**percent below poverty level:**	7.4	
g.	**percent with disability or mobility limitation:**	15.9	
h.	**estimated property insurance coverage** (Real Equalized Valuations):	Personal Property: Agricultural: Commercial: Industrial: Residential: Total:	$4,103,900 $482,600 $1,928,600 $4,798,900 $112,852,500 $124,166,500
i.	**flood insurance coverage**	Total Losses since 01/01/78: Total Payments since 01/01/78: Policies In-Force: Total Insurance In-Force:	N/A N/A 13 $1,516,400
j.	**location of floodplains:**	- flood plain along Muskegon River, Little Muskegon River, Tamarack Creek, and around Bills Lake, Croton Dam Pond and Pettit Lake	
k.	**percent that are homeowners:**	89.6	

7.	Emergency Warning System Coverage	
a.	**siren locations and/or description of warning system:**	- Consumers Energy siren/speaker locations: 52nd St. (private property); Marclay St. behind Independent Bank (county right-of-way); 68th St. (Consumers Energy property) - Fire Siren at Croton Township Fire Department (remote activation by Central Dispatch and on-site activation)
b.	**percent of population covered by warning sirens or system:**	- One mile radius for the fire department siren - ¾ mile radius at a 70-decible level and 1 ½ mile at a 60-decible level for the Consumers Energy sirens

Wildland Urban Interface area (WUI) - Croton Township *(21,760 Acres)*		
Fuels	HIGH	Flame Length 8 + Feet
Crowning Potential	HIGH	6 + Feet
Slope Percent	LOW	0 – 20%
Aspect	LOW	North, Northwest or Northeast
Elevation	HIGH	0 – 3500 feet
Initial Attack	MODERATE	21 – 30 Minutes
Suppression Capability	MODERATE	Reasonable access, some fuel problems, some barriers, no structures
Population Density	89.4 per Miles^2	1,696 Housing Structures, total population 3,042 people
Private Property	MODERATE	Threat to structures and property
Recreation	HIGH	Developed recreation site within or adjacent to area
Wildlife/Fisheries	HIGH	Highly Significant Habitat
Watershed	HIGH	Stream Class PI, I. Important water use/riparian area. Domestic water use. MUSKEGON WATERSHED
Forest/Woodland	HIGH	Standing timber / woodland on 51+% of area
Cultural Resources	MODERATE	Minimal archaeological/historical findings, potential for Native American use
Special Interest Areas	MODERATE	Area is adjacent to a Special Interest Area
Visual Resources	HIGH	Preserve and retain existing character
T&E Species	HIGH	Species Present
Soils Erosion	LOW	Low Significance EHR < 4
Airshed	MODERATE	Class 4 + 3 Airsheds moderate receptor sensitivity
Access	MODERATE	State and federal highways, county roads, and public access roads
Topography		Rolling woodlands and river valleys
Wildfire Assessment Risk	HIGH	Catastrophic Fire Possible

Land Use and Natural Features Map (USGS Quad.)

Map of Croton Township Wildland Urban Interface area (WUI) Map



EVERETT TOWNSHIP

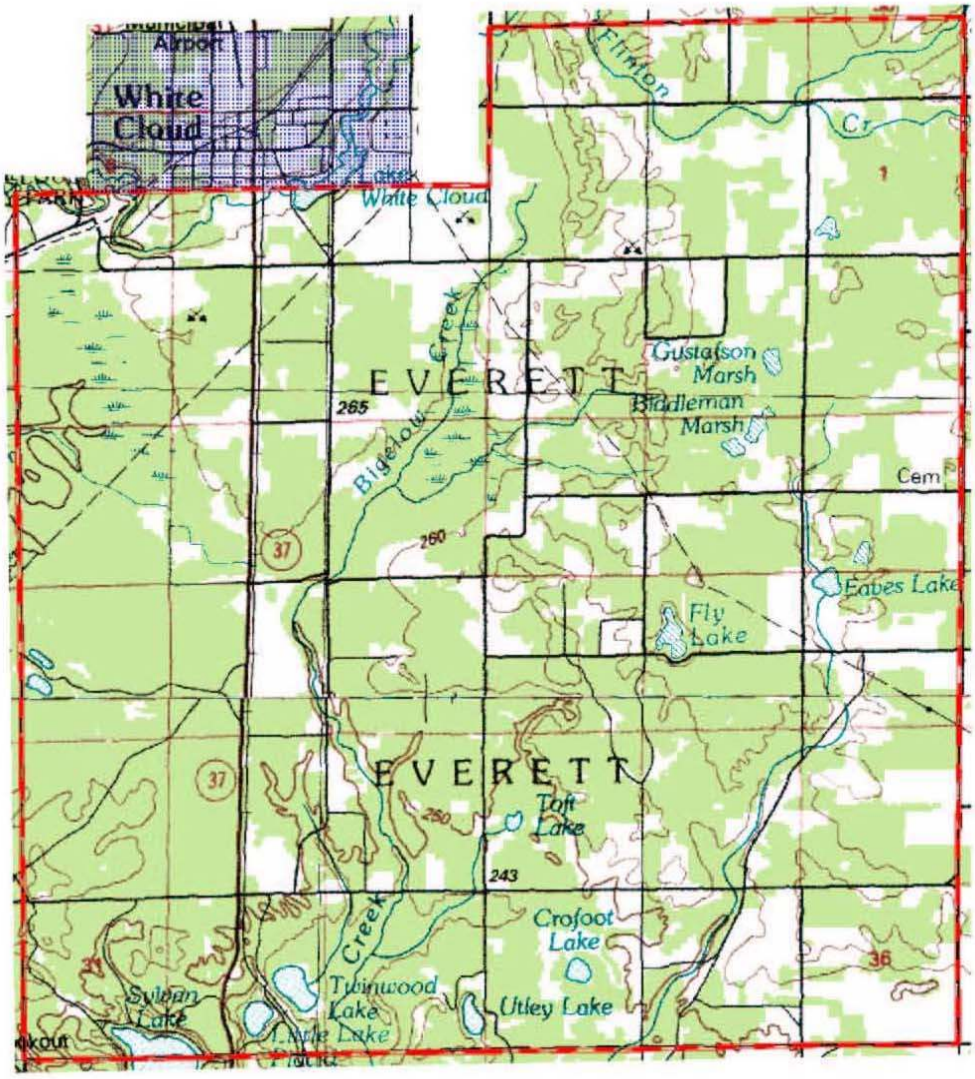
1.	**major geographic features:**	- 13-16 lakes - White River, 4 creeks - Dense forest (Manistee National Forest) and isolated agriculture - 55.8 people per square mile of land area - 25.1 housing units per square mile of land area
2.	**Population Concentrations** (including special facilities)	
a.	**group homes:**	- None Identified
b.	**large apartment buildings:**	- None Identified
c.	**schools:**	- None Identified
d.	**large office buildings:**	- None Identified
e.	**other** (such as stadiums, concert halls, amusement parks, fairgrounds, correctional facilities, nursing homes, other special populations or large crowd assembly areas):	- Sports County Park - Leisure Time RV Park, 4799 South Spruce (94 sites) - Woodlands on the Lake RV Resort, 4495 South Spruce (285 campsites) - Blue Sky Resort & Ranch, 4470 E. 28th - Johnny's Motel, 644 South Evergreen (8 rooms) - Bob's Villa Mar Motel, 3993 S Evergreen
f.	**major employers:**	- North American Refractories Company, 1301 E 8th St (135 employees)
3.	**Population Shifts** (location; time, date or season of shift; extent of shift)	
a.	**daily:**	- 581 attend school, 793 commute to work with an average commuting time of 32.9 minutes
b.	**weekly:**	N/A
c.	**seasonal:**	- 894 total housing units: 706 occupied/ 188 vacant; of the 188 vacant, 138 are for seasonal, recreational, or occasional use
4.	**Important or Critical Public and Private Facilities**	
a.	**police precincts:**	- None Identified
b.	**fire stations:**	- None Identified
c.	**public works yards:**	- None Identified
d.	**pumping stations:**	- None Identified
e.	**community shelters:**	- None Identified
f.	**community medical facilities, hospitals:**	- None Identified
g.	**other** (i.e., government buildings, record center, major construction companies, warehouses, demolition companies, heavy equipment rental, emergency equipment and vehicle storage areas, etc.):	- Township of Everett, 1516 E 8th St
5.	**Vital or Critical Infrastructure**	

a.	**roads, railroads, and bridges:**	- M-37, M-20 - M-37 bridge over White River - CSX Railroad - CSX Railroad bridge over White River	
b.	**dams, power stations, water treatment plants, sanitary lift stations, etc.:**	- Consumers Energy Power Line - White Cloud Dam - Public Sewer Service	
c.	**other** (i.e. airports, pipelines, bus terminals, train stations, military bases, marine passenger ferry services, etc.):	- None Identified	
6.	**Socio-Economic Profile of Sector**		
a.	**total population (day):**	1,278 (estimate)	
b.	**total population (night):**	1,985	
c.	**peak population (seasonal):**	2,423	
d.	**percent over 65:**	8.4	
e.	**percent under 18:**	31.4	
f.	**percent below poverty level:**	16.2	
g.	**percent with disability or mobility limitation:**	20.0	
h.	**estimated property insurance coverage** (Real Equalized Valuations):	Personal Property: Agricultural: Commercial: Industrial: Residential: Total:	$1,873,900 $0 $2,859,000 $1,514,600 $40,492,800 $46,740,300
i.	**flood insurance coverage:**	Total Losses since 01/01/78: Total Payments since 01/01/78: Policies In-Force: Total Insurance In-Force:	Not participating in flood insurance program
j.	**location of floodplains:**	- None Identified	
k.	**percent that are homeowners:**	83.1	
7.	**Emergency Warning System Coverage**		
a.	**siren locations and/or description of warning system:**	- None Identified	
b.	**percent of population covered by warning sirens or system:**	N/A	

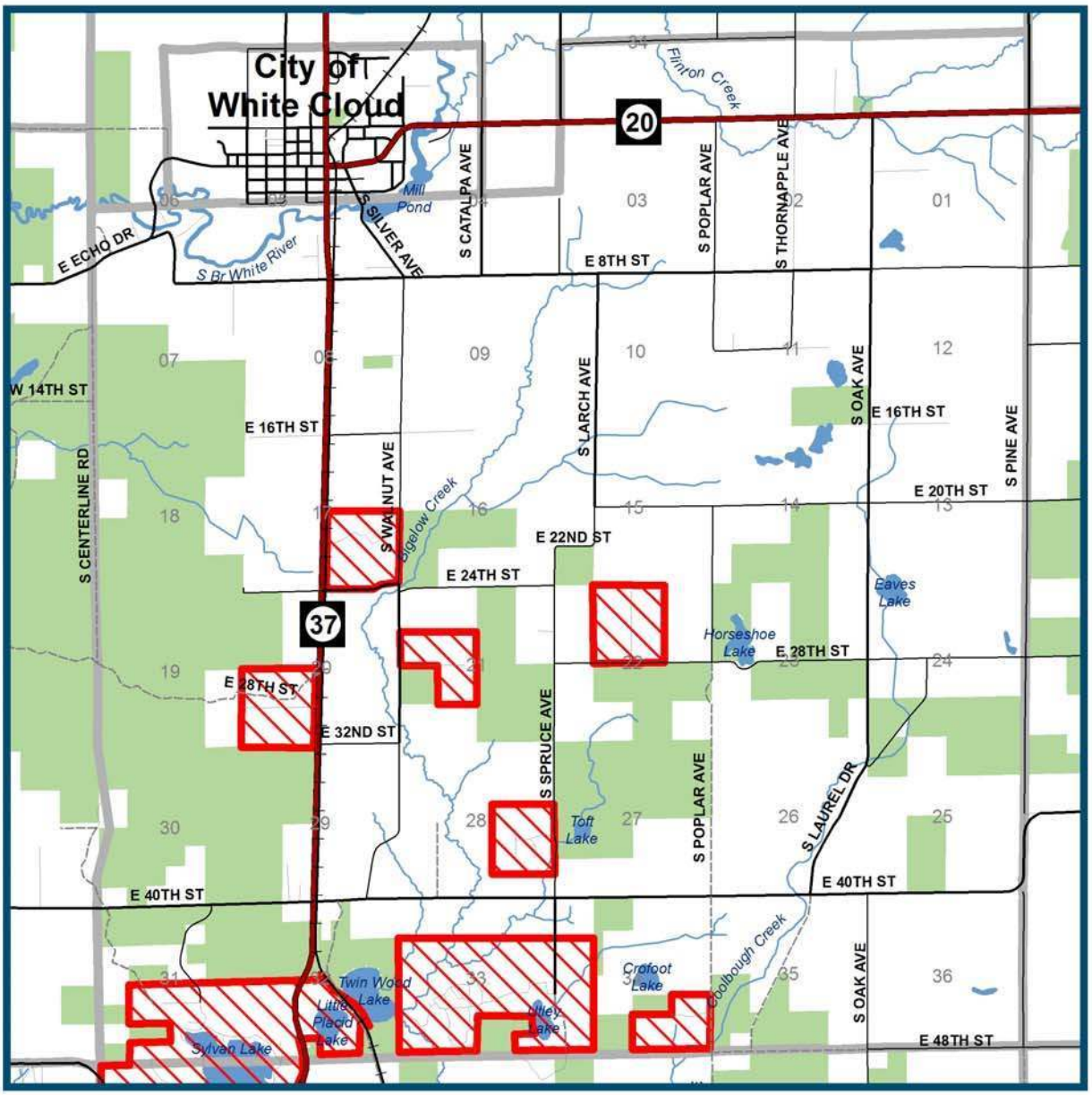
Wildland Urban Interface area (WUI) - Everett Township *(22,784 Acres)*		
Fuels	HIGH	Flame Length 8 + Feet
Crowning Potential	HIGH	6 + Feet
Slope Percent	LOW	0 – 20%
Aspect	LOW	North, Northwest or Northeast
Elevation	HIGH	0 – 3500 feet
Initial Attack	LOW	0 - 20 Minutes
Suppression Capability	MODERATE	Reasonable access, some fuel problems, some barriers, no structures
Population Density	55.8 per Miles^2	894 Housing Structures, total population 1,985 people
Private Property	MODERATE	Threat to structures and property
Recreation	HIGH	Developed high recreation use
Wildlife/Fisheries	HIGH	Highly Significant Habitat
Watershed	HIGH	Stream Class PI, I. Important water use/riparian area. Domestic water use. PERE MARQUETTE WHITE WATERSHED
Forest/Woodland	HIGH	Standing timber / woodland on 51+% of area
Cultural Resources	MODERATE	Minimal archaeological/historical findings, potential for Native American use
Special Interest Areas	MODERATE	Area is adjacent to a Special Interest Area
Visual Resources	HIGH	Preserve and retain existing character
T&E Species	HIGH	Species Present
Soils Erosion	LOW	Low Significance EHR < 4
Airshed	MODERATE	Class 4 + 3 Airsheds moderate receptor sensitivity
Access	MODERATE	State and federal highways, county roads, and public access roads
Topography		Rolling woodlands and river valleys
Wildfire Assessment Risk	HIGH	Catastrophic Fire Possible

Land Use and Natural Features Map (USGS Quad.)

Everett Township



Map of Everett Township Wildland Urban Interface area (WUI) Map



Wildfire Management Plan - Newaygo County, MI

Targeted Area of Concern
Identified Vulnerable Area
U.S. Forest Service Land
Township Boundary
Lake
River/Creek
State Highway
Paved Road
Gravel Road
Graded & Drained Road
Unimproved/Seasonal Road
Private Drive

Everett Township

0 0.25 0.5 1 Miles

N W E S

Data Sources:
MI Center for Geographic Information
Newaygo County GIS
Newaygo County MSU Extension

September 2010

Map Created By Newaygo County
MSU Extension Land Use Educator

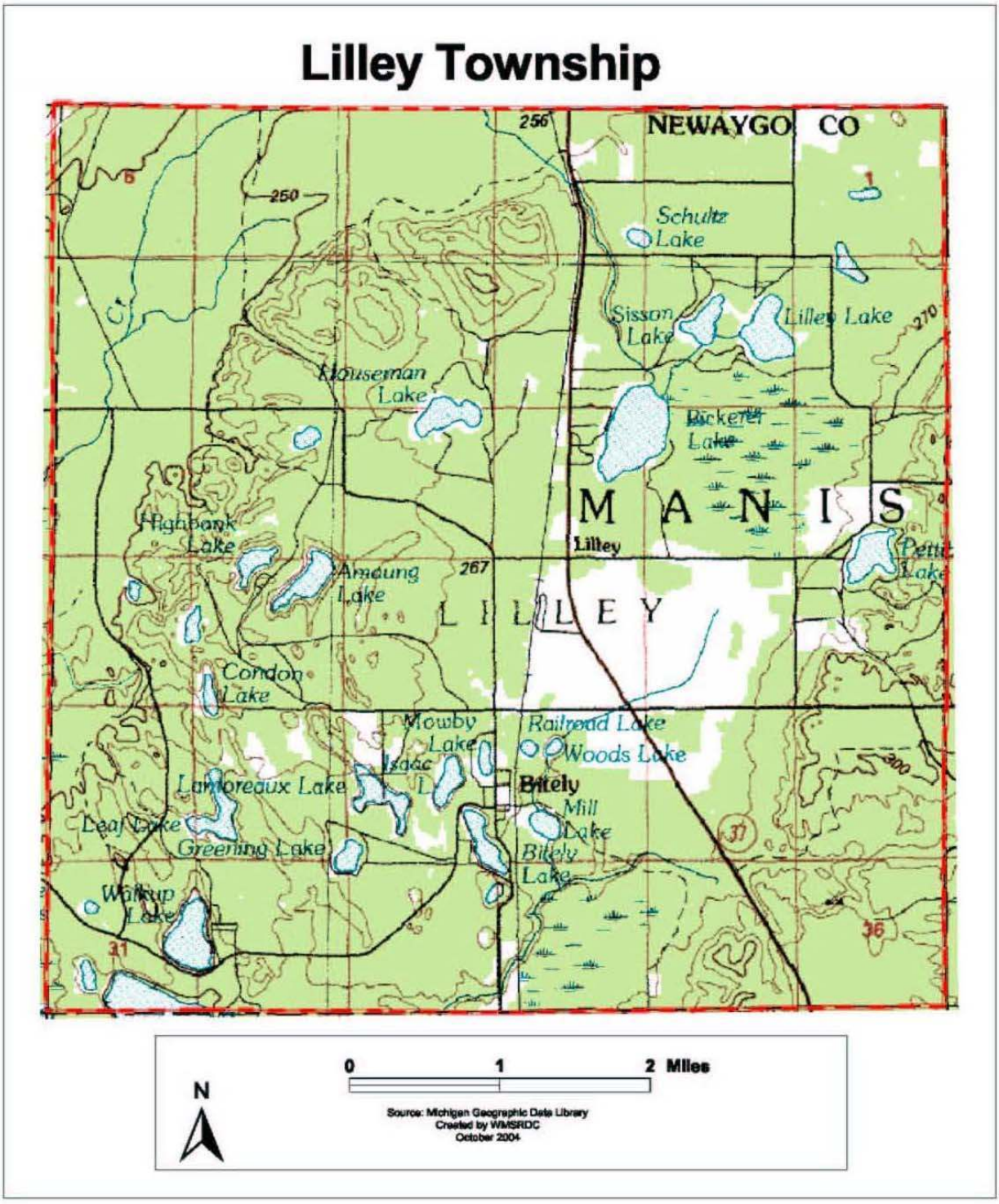
LILLEY TOWNSHIP

1.	**major geographic features:**	- 26-29 small lakes and ponds - 3 creeks - Dense forest (Manistee National Forest), isolated open field and urban development around lakes - 22.9 people per square mile of land area - 29.7 housing units per square mile of land area
2.	**Population Concentrations** (including special facilities)	
a.	**group homes:**	- None Identified
b.	**large apartment buildings:**	- None Identified
c.	**schools:**	- Bitely Head Start Program, 10697 N Bingham
d.	**large office buildings:**	- None Identified
e.	**other** (such as stadiums, concert halls, amusement parks, fairgrounds, correctional facilities, nursing homes, other special populations or large crowd assembly areas):	- Championship Snowmobile Water Race in Bitely (August) - Pettibone Lake County Park - High Banks Federal Park - Pettibone Lake Campground, 490 W Pettibone Lake Drive (16 sites) - Pickerel Lake Lakeside Campground, 12666 N. Woodbridge (46 sites)
f.	**major employers:**	- None Identified
3.	**Population Shifts** (location; time, date or season of shift; extent of shift)	
a.	**daily:**	- 153 attend school, 227 commute to work with an average commuting time of 29.8 minutes
b.	**weekly:**	N/A
c.	**seasonal:**	- 1,024 total housing units: 342 occupied/ 682 vacant; of the 682 vacant, 622 are for seasonal, recreational, or occasional use
4.	**Important or Critical Public and Private Facilities**	
a.	**police precincts:**	- None Identified
b.	**fire stations:**	- Lilley Township Fire Department, 10730 N Prospect
c.	**public works yards:**	- None Identified
d.	**pumping stations:**	- None Identified
e.	**community shelters:**	- None Identified
f.	**community medical facilities, hospitals:**	- None Identified
g.	**other** (describe – i.e., government buildings, record center, major construction companies, warehouses, demolition companies, heavy equipment rental, emergency equipment and vehicle storage, etc.):	- Township of Lilley, 10722 N Bingham Ave - United States Post Office, Bitely 10647 N Bingham

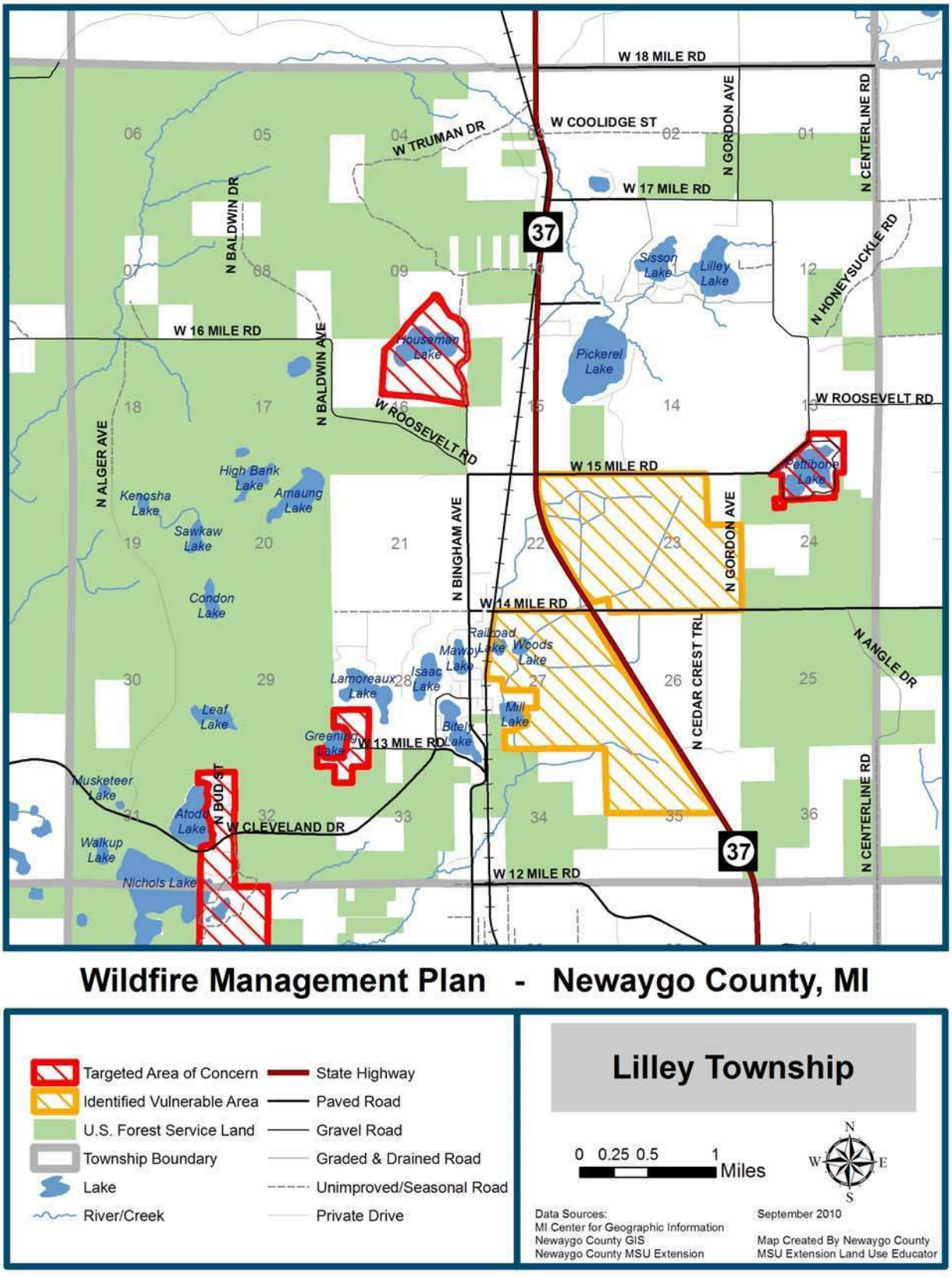
5.	Vital or Critical Infrastructure		
a.	**roads, railroads, and bridges:**	- M-37, B-96 - CSX Railroad	
b.	**dams, power stations, water treatment plants, sanitary lift stations, etc.:**	- None Identified	
c.	**other** (i.e. airports, pipelines, bus terminals, train stations, military bases, marine passenger ferry services, etc.):	- None Identified	
6.	**Socio-Economic Profile of Sector**		
a.	**total population (day):**	562 (estimate)	
b.	**total population (night):**	788	
c.	**peak population (seasonal):**	2,505	
d.	**percent over 65:**	19.2	
e.	**percent under 18:**	22.2	
f.	**percent below poverty level:**	20.2	
g.	**percent with disability or mobility limitation:**	25.6	
h.	**estimated property insurance coverage** (Real Equalized Valuations):	Personal Property: Agricultural: Commercial: Industrial: Residential: Total:	$367,600 $0 $1,982,300 $0 $33,557,700 $35,907,600
i.	**flood insurance coverage**	Total Losses since 01/01/78: Total Payments since 01/01/78: Policies In-Force: Total Insurance In-Force:	Not participating in flood insurance program
j.	**location of floodplains:**	- None Identified	
k.	**percent that are homeowners:**	91.5	
7.	**Emergency Warning System Coverage**		
a.	**siren locations and/or description of warning system:**	- Fire Siren at Lilley Township Fire Department (remote activation by Central Dispatch and on-site activation)	
b.	**percent of population covered by warning sirens or system:**	- One mile radius	

Wildland Urban Interface area (WUI) - Lilley Township *(22,080 Acres)*		
Fuels	HIGH	Flame Length 8 + Feet
Crowning Potential	HIGH	6 + Feet
Slope Percent	LOW	0 – 20%
Aspect	LOW	North, Northwest or Northeast
Elevation	HIGH	0 – 3500 feet
Initial Attack	LOW	0 - 20 Minutes
Suppression Capability	HIGH	Complex – Limited to poor access, medium fuel, minimally effective barriers, some structures
Population Density	22.9 per Miles²	1,024 Housing Structures, Population 788 People
Private Property	HIGH	High loss and treat potential due to numbers and placement
Recreation	HIGH	Developed high recreation use
Wildlife/Fisheries	HIGH	Highly Significant Habitat
Watershed	HIGH	Stream Class PI, I. Important water use/riparian area. Domestic water use. PERE MARQUETTE WHITE WATERSHED
Forest/Woodland	HIGH	Standing timber / woodland on 51+% of area
Cultural Resources	MODERATE	Minimal archaeological/historical findings, potential for Native American use
Special Interest Areas	HIGH	A majority of the area is classified as a Special Interest Area
Visual Resources	MODERATE	Partially retain existing character
T&E Species	HIGH	Species Present
Soils Erosion	LOW	Low Significance EHR < 4
Airshed	MODERATE	Class 4 + 3 Airsheds moderate receptor sensitivity
Access	MODERATE	State and federal highways, county roads, and public access roads
Topography		Rolling woodlands and river valleys
Wildfire Assessment Risk	HIGH	Catastrophic Fire Possible

Land Use and Natural Features Map (USGS Quad.)



Map of Lilley Township Wildland Urban Interface area (WUI)



Wildfire Management Plan - Newaygo County, MI

Targeted Area of Concern
Identified Vulnerable Area
U.S. Forest Service Land
Township Boundary
Lake
River/Creek
State Highway
Paved Road
Gravel Road
Graded & Drained Road
Unimproved/Seasonal Road
Private Drive

Lilley Township

0 0.25 0.5 1 Miles

N W E S

Data Sources:
MI Center for Geographic Information
Newaygo County GIS
Newaygo County MSU Extension

September 2010

Map Created By Newaygo County
MSU Extension Land Use Educator

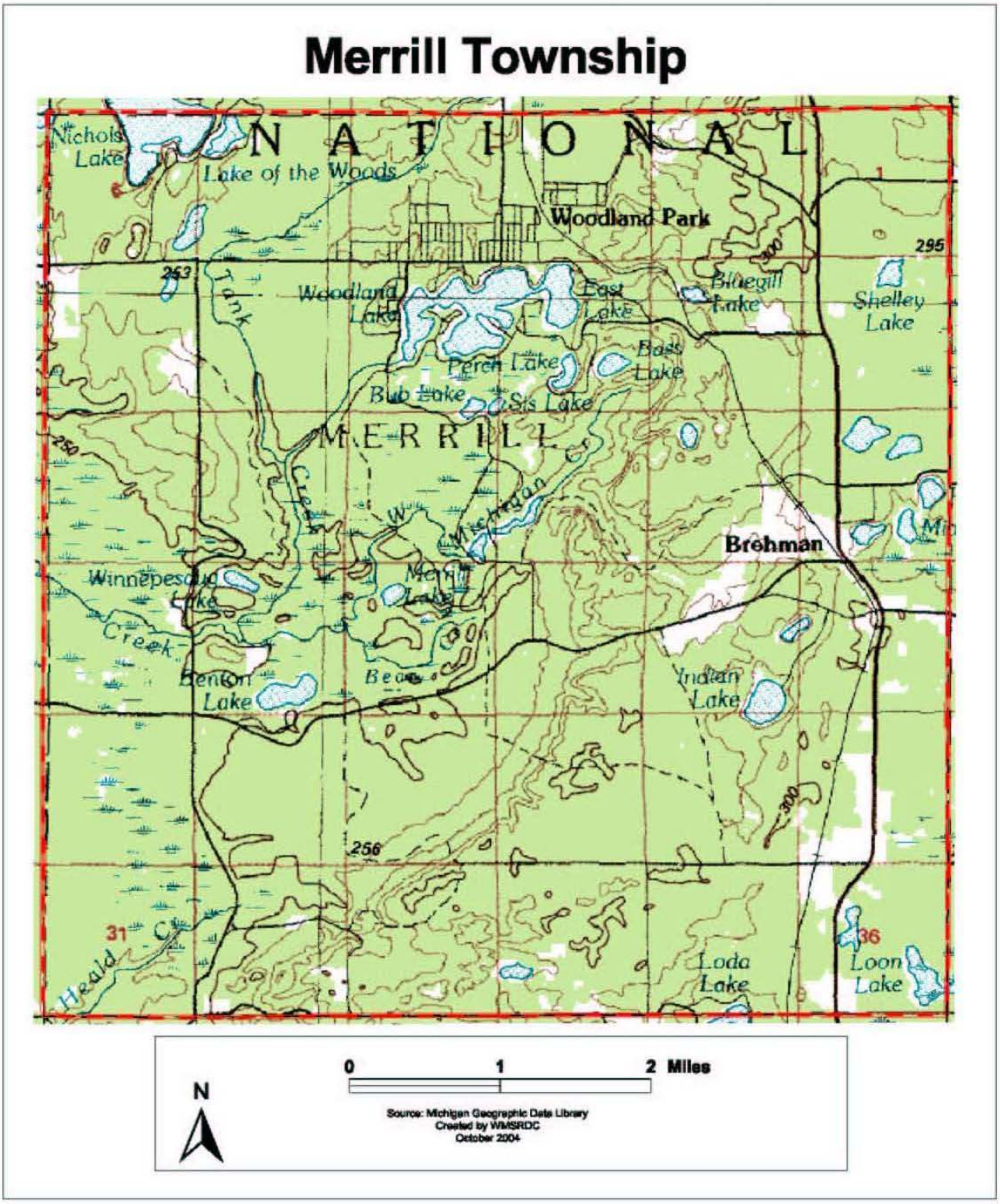
MERRILL TOWNSHIP

1.	**major geographic features:**	- South Branch Pere Marquette River, 3 creeks - 21-24 small lakes and ponds - Dense forests (Manistee National Forest) and isolated wetlands - 16.9 people per square mile of land area - 22.4 housing units per square mile of land area
2.	**Population Concentrations** (including special facilities)	
a.	**group homes:**	- None Identified
b.	**large apartment buildings:**	- None Identified
c.	**schools:**	- None Identified
d.	**large office buildings:**	- None Identified
e.	**other** (such as stadiums, concert halls, amusement parks, fairgrounds, correctional facilities, nursing homes, other special populations or large crowd assembly areas):	- Benton Lake Federal Park - Nichols Lake South Federal Park
f.	**major employers:**	- None Identified
3.	**Population Shifts** (location; time, date or season of shift; extent of shift)	
a.	**daily:**	- 110 attend school, 189 commute to work with an average commuting time of 50.9 minutes
b.	**weekly:**	N/A
c.	**seasonal:**	- 782 total housing units: 262 occupied/ 520 vacant; of the 520 vacant, 451 are for seasonal, recreational, or occasional use
4.	**Important or Critical Public and Private Facilities**	
a.	**police precincts:**	- None Identified
b.	**fire stations:**	- Covered by Lilley Township Fire Department
c.	**public works yards:**	- None Identified
d.	**pumping stations:**	- None Identified
e.	**community shelters:**	- None Identified
f.	**community medical facilities, hospitals:**	- None Identified
g.	**other** (i.e., government buildings, record center, major construction companies, warehouses, demolition companies, heavy equipment rental, emergency equipment and vehicle storage areas, etc.):	- Township of Merrill, 1585 W 11 Mile Rd - United Stated Post Office, Brohman, 7261 Woodbridge Rd
5.	**Vital or Critical Infrastructure**	
a.	**roads, railroads, and bridges:**	- M-37 - CSX Railroad
b.	**dams, power stations, water treatment plants, sanitary lift stations, etc.:**	- Michigan Creek Dam

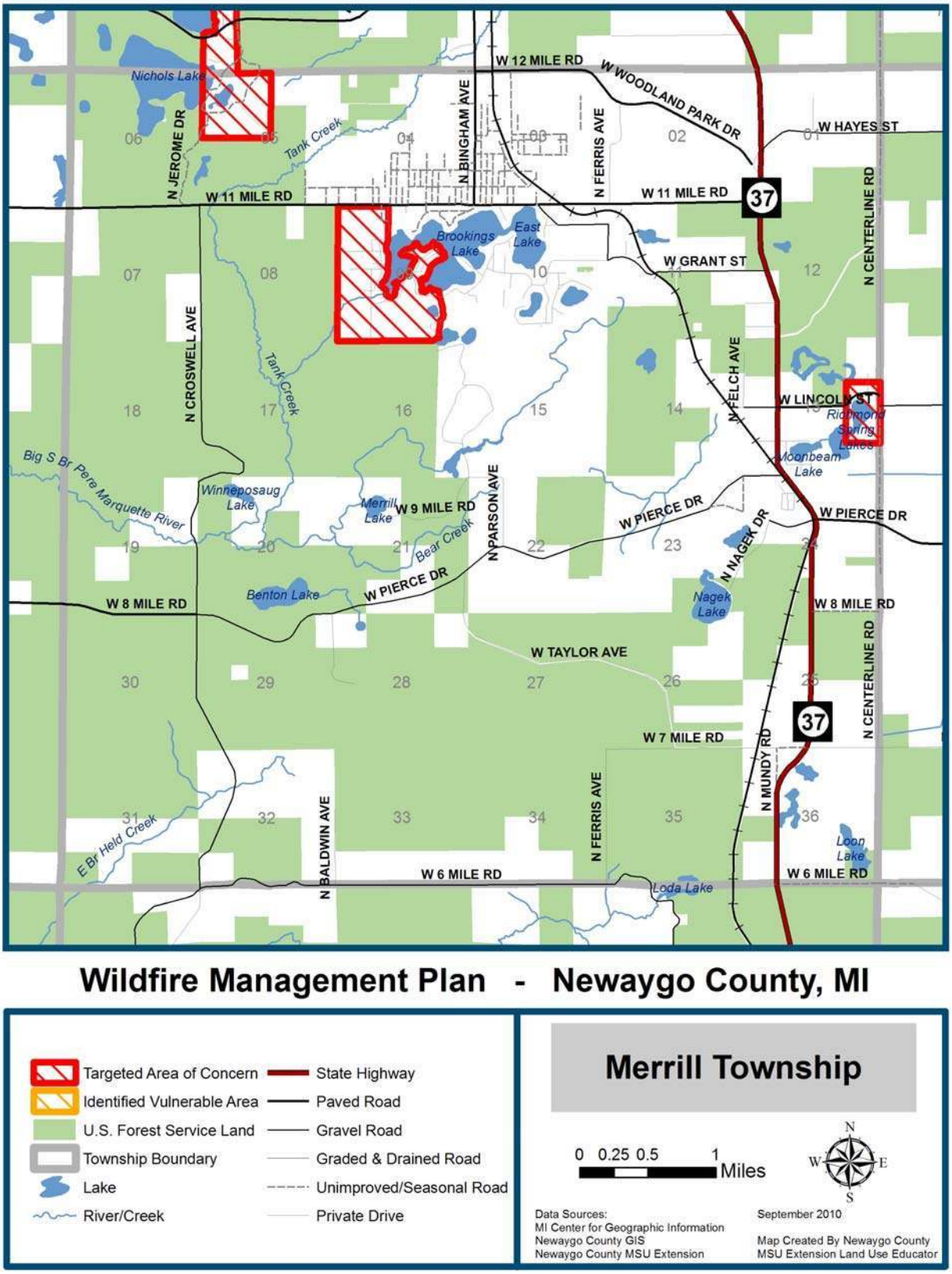
c.	**other** (describe – i.e. airports, pipelines, bus terminals, train stations, military bases, marine passenger ferry services, etc.):	- None Identified	
6.	**Socio-Economic Profile of Sector**		
a.	**total population (day):**	329 (estimate)	
b.	**total population (night):**	590	
c.	**peak population (seasonal):**	1,876	
d.	**percent over 65:**	20.5	
e.	**percent under 18:**	25.6	
f.	**percent below poverty level:**	19.8	
g.	**percent with disability or mobility limitation:**	30.7	
h.	**estimated property insurance coverage** (Real Equalized Valuations):	Personal Property: Agricultural: Commercial: Industrial: Residential: Total:	$322,800 $124,600 $724,700 $0 $24,884,000 $26,056,100
i.	**flood insurance coverage:**	Total Losses since 01/01/78: Total Payments since 01/01/78: Policies In-Force: Total Insurance In-Force:	Not participating in flood insurance program
j.	**location of floodplains:**	- None Identified	
k.	**percent that are homeowners:**	85.1	
7.	**Emergency Warning System Coverage**		
a.	**siren locations and/or description of warning system:**	- None Identified	
b.	**percent of population covered by warning sirens or system:**	N/A	

Wildland Urban Interface area (WUI) - Merrill Township *(22,336 Acres)*		
Fuels	HIGH	Flame Length 8 + Feet
Crowning Potential	HIGH	6 + Feet
Slope Percent	LOW	0 – 20%
Aspect	LOW	North, Northwest or Northeast
Elevation	HIGH	0 – 3500 feet
Initial Attack	LOW	0 - 20 Minutes
Suppression Capability	HIGH	Complex – Limited to poor access, medium fuel, minimally effective barriers, some structures
Population Density	16.9 per Miles²	782 Housing Structures, Population 590 People
Private Property	HIGH	High loss and treat potential due to numbers and placement
Recreation	HIGH	Developed high recreation use
Wildlife/Fisheries	HIGH	Highly Significant Habitat
Watershed	HIGH	Stream Class PI, I. Important water use/riparian area. Domestic water use. PERE MARQUETTE WHITE WATERSHED
Forest/Woodland	HIGH	Standing timber / woodland on 51+% of area
Cultural Resources	MODERATE	Minimal archaeological/historical findings, potential for Native American use
Special Interest Areas	HIGH	A majority of the area is classified as a Special Interest Area
Visual Resources	MODERATE	Partially retain existing character
T&E Species	HIGH	Species Present
Soils Erosion	LOW	Low Significance EHR < 4
Airshed	MODERATE	Class 4 + 3 Airsheds moderate receptor sensitivity
Access	MODERATE	State and federal highways, county roads, and public access roads
Topography		Rolling woodlands and river valleys
Wildfire Assessment Risk	HIGH	Catastrophic Fire Possible

Land Use and Natural Features Map (USGS Quad.)



Map of Merrill Township Wildland Urban Interface area (WUI)



SECTION SEVEN – WILDFIRE RISK ASSESSMENT

Risk Assessment and Mitigation Strategies (RAMS)

This Plan has been prepared for the Newaygo County Community Wildfire Protection Plan using 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 steps involved in this process included:

- Listing Management Objectives for the Newaygo County Community Wildfire Protection Plan
- Identification of spatial Compartments for study
- Assessment of significant issues within each Compartment
- Identification of Management Objectives within each Compartment

Management Objectives

The following Management Objectives were identified for the Newaygo County Community Wildfire Protection Plan:

1. Suppress wildfires using an appropriate management response, in a manner compatible with Management Area objectives. (Source: HMF Fire Management Plan)

2. Encourage adequate fire prevention, fire-safe construction, and pre-suppression activities on private lands in WUI using Firewise (Source: HMF Fire Management Plan)

3. Support the members of the Michigan Interagency Fire Prevention (MFPA) as a way to further the message of fire prevention. (Source: HMF Fire Management Plan)

4. Continue to assist and encourage communities to prepare and participate in the CWPP's (Source: National Fire management Plan)

5. Utilize fuels management techniques to restore fire to its natural role in the ecosystem (Source: National fire Management Plan)

Compartment Design Criteria:

The county was divided in half, North and South, with twelve communities (Townships) in each half.

Community Listing

Code	Description	
1	Ashland Township	South Half
2	Barton Township	North Half
3	Beaver Township	North Half
4	Big Prairie Township	South Half
5	Bridgeton Township	South Half
6	Brooks Township	South Half
7	Croton Township	South Half
8	Dayton Township	South Half
9	Denver Township	North Half
10	Ensley Township	South Half
11	Everett Township	South Half
12	Garfield Township	South Half
13	Goodwell Township	North Half
14	Grant Township	South Half
15	Home Township	North Half
16	Lilley Township	North Half
17	Lincoln Township	North Half
18	Merrill Township	North Half
19	Monroe Township	North Half
20	Norwich Township	North Half
21	Sheridan Township	South Half
22	Sherman Township	South Half
23	Troy Township	North Half
24	Wilcox Township	North Half

FUELS HAZARD CRITERIA

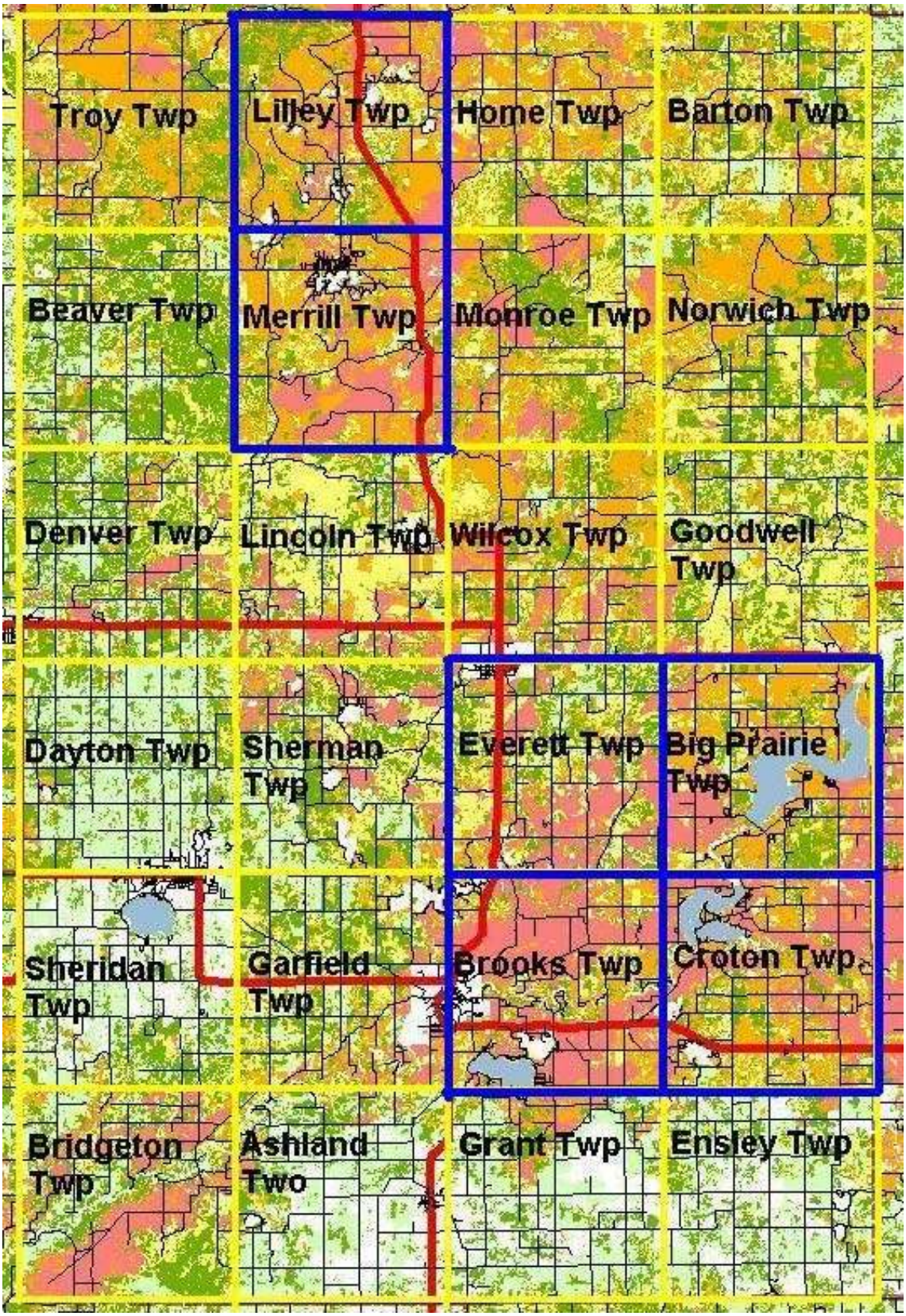
The assessment of FUEL HAZARDS deal with identifying areas of like fire behavior based on fuel and topography. Given a normal fire season, how intense (as measured by flame length) would a fire burn? Under average fire season conditions, fire intensity is largely a product of fuel and topography.

FUEL HAZARD RATING

Vulnerability Factors	High	Medium	Low
FUEL (flame length produced)	8+ feet	4 – 6 feet	0 – 2 feet
CROWNING POTENTIAL (as per Appendix A)	6+	3 – 5	0 – 2
SLOPE (average)	36+%	21 – 35%	0 – 20%
ASPECT (dominant on site)	South	East or West	North, Northwest or Northeast
ELEVATION	0 – 3500 feet	3501-5000 feet	5001+ feet

FUELS HAZARD RATING						
Township	***FUEL***	***CROWN***	***SLOPE***	***ASPECT***	***ELEVATION***	***TOTAL***
Ashland	LOW	LOW	LOW	LOW	HIGH	**LOW**
Barton	MODERATE	MODERATE	LOW	LOW	HIGH	**MODERATE**
Beaver	LOW	MODERATE	LOW	LOW	HIGH	**MODERATE**
Big Prairie	HIGH	HIGH	LOW	LOW	HIGH	**MODERATE**
Bridgeton	LOW	LOW	LOW	LOW	HIGH	**LOW**
Brooks	HIGH	HIGH	LOW	LOW	HIGH	**MODERATE**
Croton	HIGH	HIGH	LOW	LOW	HIGH	**MODERATE**
Dayton	LOW	LOW	LOW	LOW	HIGH	**LOW**
Denver	MODERATE	HIGH	LOW	LOW	HIGH	**MODERATE**
Ensley	LOW	LOW	LOW	LOW	HIGH	**LOW**
Everett	HIGH	HIGH	LOW	LOW	HIGH	**MODERATE**
Garfield	LOW	LOW	LOW	LOW	HIGH	**LOW**
Goodwell	MODERATE	LOW	LOW	LOW	HIGH	**MODERATE**
Grant	MODERATE	LOW	LOW	LOW	HIGH	**MODERATE**
Home	HIGH	HIGH	LOW	LOW	HIGH	**MODERATE**
Lilley	HIGH	HIGH	LOW	LOW	HIGH	**MODERATE**
Lincoln	MODERATE	HIGH	LOW	LOW	HIGH	**MODERATE**
Merrill	HIGH	HIGH	LOW	LOW	HIGH	**MODERATE**
Monroe	HIGH	HIGH	LOW	LOW	HIGH	**MODERATE**
Norwich	HIGH	HIGH	LOW	LOW	HIGH	**MODERATE**
Sheridan	LOW	LOW	LOW	LOW	HIGH	**LOW**
Sherman	LOW	MODERATE	LOW	LOW	HIGH	**MODERATE**
Troy	HIGH	HIGH	LOW	LOW	HIGH	**MODERATE**
Wilcox	HIGH	HIGH	LOW	LOW	HIGH	**MODERATE**

FUELS MAP


Troy Twp
Lilley Twp
Home Twp
Barton Twp
Beaver Twp
Merrill Twp
Monroe Twp
Norwich Twp
Denver Twp
Lincoln Twp
Wilcox Twp
Goodwell Twp
Dayton Twp
Sherman Twp
Everett Twp
Big Prairie Twp
Sheridan Twp
Garfield Twp
Brooks Twp
Croton Twp
Bridgeton Twp
Ashland Two
Grant Twp
Ensley Twp

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 (fireline production capability)	0.6+ chains/person hour	1.4 to 2.5 chains/person hour	More than 2.6 chains/person hour
RATE OF SPREAD (behave output)	9+ chains per hour	5 – 8 chains per hour	1 – 4 chains per hour

PROTECTION CAPABILITIES RATING				
Township	**INITIAL ATTACK**	**SUPPRESSION COMPLEXITY**	**FIREWISE COMPLIANT**	**TOTAL**
Ashland	LOW	MODERATE	HIGH	**MODERATE**
Barton	MODERATE	HIGH	HIGH	**HIGH**
Beaver	LOW	MODERATE	HIGH	**MODERATE**
Big Prairie	LOW	MODERATE	HIGH	**MODERATE**
Bridgeton	LOW	MODERATE	HIGH	**MODERATE**
Brooks	LOW	MODERATE	HIGH	**MODERATE**
Croton	MODERATE	MODERATE	HIGH	**HIGH**
Dayton	LOW	LOW	HIGH	**LOW**
Denver	LOW	MODERATE	HIGH	**MODERATE**
Ensley	LOW	MODERATE	HIGH	**MODERATE**
Everett	LOW	MODERATE	HIGH	**MODERATE**
Garfield	LOW	MODERATE	HIGH	**MODERATE**
Goodwell	LOW	LOW	HIGH	**LOW**
Grant	LOW	MODERATE	HIGH	**MODERATE**
Home	LOW	HIGH	HIGH	**HIGH**
Lilley	LOW	HIGH	HIGH	**HIGH**
Lincoln	LOW	LOW	HIGH	**LOW**
Merrill	LOW	HIGH	HIGH	**HIGH**
Monroe	LOW	HIGH	HIGH	**HIGH**
Norwich	LOW	MODERATE	HIGH	**MODERATE**
Sheridan	LOW	LOW	HIGH	**LOW**
Sherman	LOW	LOW	HIGH	**LOW**
Troy	LOW	HIGH	HIGH	**HIGH**
Wilcox	LOW	MODERATE	HIGH	**MODERATE**

Ignition Risk Rating

	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

IGNITION RISK RATING											
Township	***Population Density***	***Housing Units***	***Power lines***	***Industrial Ops***	***Recreation***	***Flammable Present***	***Rail***	***Transport System***	***Commercial Develop.***	***Other***	***Total***
Ashland	MODERATE 73.6	MODERATE 944	HIGH	LOW	HIGH	MODERATE	HIGH	HIGH	HIGH	HIGH	**HIGH**
Barton	LOW 22.9	LOW 382	MODERATE	LOW	LOW	LOW	LOW	MODERATE	MODERATE	LOW	**LOW**
Beaver	LOW 17.1	LOW 292	MODERATE	LOW	HIGH	MODERATE	LOW	MODERATE	MODERATE	MOD	**LOW**
Big Prairie	MODERATE 78.2	HIGH 1,474	HIGH	LOW	HIGH	MODERATE	LOW	HIGH	MODERATE	HIGH	**MODERATE**
Bridgeton	MODERATE 59.1	MODERATE 812	MODERATE	HIGH	HIGH	MODERATE	LOW	MODERATE	MODERATE	HIGH	**MODERATE**
Brooks	HIGH 115.6	HIGH 1,978	HIGH	HIGH	HIGH	MODERATE	HIGH	HIGH	HIGH	HIGH	**HIGH**
Croton	MODERATE 89.4	HIGH 1,696	HIGH	MODERATE	HIGH	MODERATE	LOW	HIGH	MODERATE	HIGH	**MODERATE**
Dayton	MODERATE 59.2	MODERATE 739	HIGH	HIGH	HIGH	MODERATE	LOW	HIGH	HIGH	HIGH	**HIGH**
Denver	MODERATE 55.7	MODERATE 904	MODERATE	HIGH	HIGH	MODERATE	LOW	HIGH	HIGH	HIGH	**MODERATE**
Ensley	MODERATE 69.3	MODERATE 939	HIGH	LOW	MODERATE	MODERATE	LOW	MODERATE	LOW	LOW	**LOW**
Everett	MODERATE 55.8	MODERATE 894	MODERATE	MODERATE	HIGH	MODERATE	HIGH	HIGH	HIGH	HIGH	**HIGH**
Garfield	MODERATE 74.7	HIGH 1,096	HIGH	HIGH	HIGH	MODERATE	HIGH	HIGH	HIGH	HIGH	**HIGH**
Goodwell	LOW 15.5	LOW 284	MODERATE	LOW	LOW	MODERATE	LOW	HIGH	MODERATE	HIGH	**LOW**

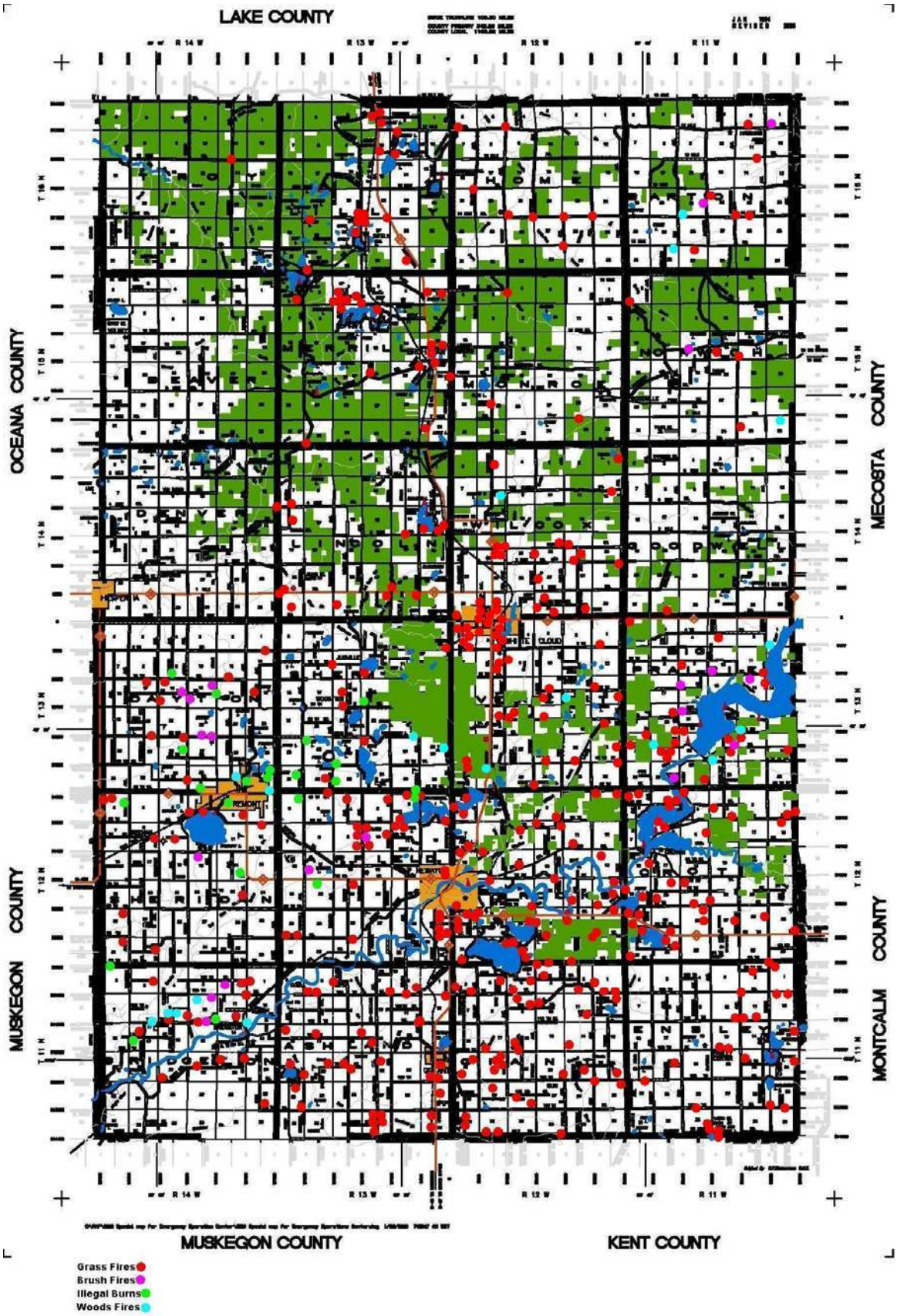
IGNITION RISK RATING CONTINUED											
Township	***Population Density***	***Housing Units***	***Power lines***	***Industrial Ops***	***Recreation***	***Flammable Present***	***Rail***	***Transport System***	***Commercial Develop***	***Other***	***Total***
Grant	MODERATE 87.2	HIGH 1,113	HIGH	LOW	MODERATE	MODERATE	LOW	HIGH	HIGH	HIGH	**HIGH**
Home	LOW 7.3	LOW 220	MODERATE	HIGH	MODERATE	MODERATE	LOW	MODERATE	HIGH	HIGH	**LOW**
Lilley	LOW 22.9	HIGH 1,024	MODERATE	HIGH	HIGH	MODERATE	HIGH	HIGH	MODERATE	HIGH	**HIGH**
Lincoln	LOW 38.1	MODERATE 850	MODERATE	MODERATE	HIGH	MODERATE	HIGH	HIGH	MODERATE	HIGH	**MODERATE**
Merrill	LOW 16.9	MODERATE 782	MODERATE	HIGH	HIGH	MODERATE	HIGH	HIGH	MODERATE	HIGH	**MODERATE**
Monroe	LOW 9.0	LOW 289	HIGH	HIGH	MODERATE	MODERATE	LOW	MODERATE	MODERATE	HIGH	**LOW**
Norwich	LOW 15.8	LOW 235	MODERATE	MODERATE	HIGH	MODERATE	LOW	MODERATE	MODERATE	MOD	**LOW**
Sheridan	MODERATE 73	MODERATE 950	HIGH	HIGH	HIGH	MODERATE	HIGH	HIGH	HIGH	HIGH	**HIGH**
Sherman	MODERATE 62.4	MODERATE 997	HIGH	HIGH	MODERATE	MODERATE	LOW	MODERATE	MODERATE	HIGH	**MODERATE**
Troy	LOW 6.7	LOW 184	MODERATE	MODERATE	MODERATE	MODERATE	LOW	MODERATE	MODERATE	HIGH	**LOW**
Wilcox	LOW 33.8	MODERATE 577	HIGH	MODERATE	MODERATE	MODERATE	HIGH	HIGH	HIGH	HIGH	**MODERATE**

History of Wildland Fire Occurrence for Newaygo County

(Grass, Woods, and Illegal Burn Fire Starts)

Township	Fire Dept	2005	2006	2007	2008	2009	NFS	Total
Ashland	Station 13 – Grant Fire	10	4	5	11	5	0	**35**
Barton	Big Rapids City Fire	3	2	1	1	3	5	**15**
Beaver	Station 19 – Hesperia Fire	1	0	0	0	0	12	**14**
	Walkerville Fire	0	0	1	0	0		
Big Prairie	Station 15 – Big Prairie Fire	5	9	0	7	10	14	**45**
Bridgeton	Station 11 – Fremont Fire	4	3	2	5	5	0	**22**
	Station 13 - Grant Fire	1	1	1	0	1		
Brooks	Station 12 – Newaygo Fire	11	9	7	7	9	21	**64**
Croton	Station 14 – Croton Fire	5	9	6	9	12	22	**63**
Dayton	Station 11 – Fremont Fire	6	3	3	4	6	1	**26**
	Station 19 – Hesperia Fire	1	0	0	2	0		
Denver	Station 19 – Hesperia Fire	5	4	0	4	3	8	**24**
Ensley	Sand Lake Fire	6	9	4	2	5	1	**27**
Everett	Station 18 – White Cloud Fire	5	10	3	7	8	23	**56**
Garfield	Station 11 –Fremont Fire	3	2	3	2	1	6	**34**
	Station 12 – Newaygo Fire	8	2	4	1	2		
Goodwell	Station 15 – Big Prairie Fire	1	0	0	0	0	9	**10**
Grant	Station 13 – Grant Fire	12	7	7	6	10	3	**45**
Home	Station 17 – Lilley Fire	1	0	3	1	1	17	**23**
Lilley	Station 17 – Lilley Fire	1	5	1	4	3	32	**46**
Lincoln	Station 18 – White Cloud Fire	6	1	4	2	1	25	**39**
Merrill	Station 17 – Lilley Fire	5	3	0	4	6	33	**51**
Monroe	Station 17 – Lilley Fire	1	0	0	0	1	16	**18**
Norwich	Big Rapids City Fire	0	3	1	1	2	20	**27**
Sheridan	Station 11 – Fremont Fire	3	3	3	2	6	0	**17**
Sherman	Station 11 – Fremont Fire	4	1	3	5	5	24	**45**
	Station 18 – White Cloud Fire	0	1	0	1	1		
Troy	Walkerville Fire	3	4	0	0	0	19	**28**
	Station 17 – Lilley Fire	0	0	0	0	2		
Wilcox	Station 18 – White Cloud Fire	16	10	2	3	5	29	**65**

Newaygo County Fire Starts Map 2005-2009



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.

VALUE RATING

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

VALUE RATING

(continued)

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 airsheds high receptor sensitivity	Class 4 + 3 airsheds moderate receptor sensitivity	Class 2 + 1 airsheds/ low receptor sensitivity
VEGETATION (sensitive species)	Plant occurrences of significance	Potential for sensitive plants	No sightings, little potential, minimal significance
OTHER (specify)			

VALUES RATING												
Township	**Recreation**	**Wildlife**	**Watershed**	**Timber**	**Private Property**	**Cultural Resources**	**Special Interest Areas**	**Visual Resource**	**T & E Species**	**Soils**	**Airshed**	**Total**
Ashland	MODERATE	HIGH	HIGH	MOD	MODERATE	MODERATE	MODERATE	HIGH	HIGH	LOW	MOD	**MOD**
Barton	LOW	HIGH	LOW	MOD	LOW	MODERATE	LOW	MODERATE	HIGH	LOW	MOD	**LOW**
Beaver	MODERATE	HIGH	HIGH	MOD	MODERATE	LOW	LOW	HIGH	HIGH	LOW	MOD	**LOW**
Big Prairie	HIGH	HIGH	HIGH	HIGH	MODERATE	MODERATE	MODERATE	HIGH	HIGH	LOW	MOD	**MOD**
Bridgeton	HIGH	HIGH	HIGH	HIGH	MODERATE	MODERATE	MODERATE	HIGH	HIGH	LOW	MOD	**MOD**
Brooks	HIGH	HIGH	HIGH	HIGH	HIGH	MODERATE	MODERATE	HIGH	HIGH	LOW	MOD	**HIGH**
Croton	HIGH	HIGH	HIGH	HIGH	MODERATE	MODERATE	MODERATE	HIGH	HIGH	LOW	MOD	**MOD**
Dayton	MODERATE	HIGH	HIGH	MOD	MODERATE	MODERATE	MODERATE	HIGH	HIGH	LOW	MOD	**MOD**
Denver	MODERATE	HIGH	HIGH	MOD	MODERATE	MODERATE	MODERATE	HIGH	HIGH	LOW	MOD	**MOD**
Ensley	LOW	HIGH	LOW	MOD	HIGH	MODERATE	LOW	HIGH	HIGH	LOW	MOD	**LOW**
Everett	HIGH	HIGH	HIGH	HIGH	MODERATE	MODERATE	MODERATE	HIGH	HIGH	LOW	MOD	**MOD**
Garfield	HIGH	HIGH	HIGH	MOD	HIGH	MODERATE	MODERATE	HIGH	HIGH	LOW	MOD	**MOD**
Goodwell	LOW	HIGH	LOW	HIGH	MODERATE	MODERATE	MODERATE	HIGH	HIGH	LOW	MOD	**LOW**
Grant	MODERATE	HIGH	LOW	MOD	MODERATE	MODERATE	MODERATE	HIGH	HIGH	LOW	MOD	**LOW**
Home	MODERATE	HIGH	LOW	HIGH	HIGH	MODERATE	HIGH	MODERATE	HIGH	LOW	MOD	**MOD**
Lilley	HIGH	HIGH	HIGH	HIGH	HIGH	MODERATE	HIGH	MODERATE	HIGH	LOW	MOD	**HIGH**
Lincoln	HIGH	HIGH	HIGH	HIGH	MODERATE	MODERATE	MODERATE	HIGH	HIGH	LOW	MOD	**MOD**
Merrill	HIGH	HIGH	HIGH	HIGH	HIGH	MODERATE	HIGH	MODERATE	HIGH	LOW	MOD	**HIGH**
Monroe	MODERATE	HIGH	LOW	HIGH	HIGH	MODERATE	HIGH	MODERATE	HIGH	LOW	MOD	**MOD**
Norwich	HIGH	HIGH	LOW	MOD	MODERATE	MODERATE	MODERATE	MODERATE	HIGH	LOW	MOD	**LOW**
Sheridan	MODERATE	HIGH	HIGH	HIGH	MODERATE	MODERATE	MODERATE	HIGH	HIGH	LOW	MOD	**MOD**
Sherman	MODERATE	HIGH	HIGH	HIGH	MODERATE	MODERATE	MODERATE	HIGH	HIGH	LOW	MOD	**MOD**
Troy	MODERATE	HIGH	HIGH	HIGH	HIGH	MODERATE	HIGH	MODERATE	HIGH	LOW	MOD	**MOD**
Wilcox	MODERATE	HIGH	HIGH	HIGH	MODERATE	MODERATE	MODERATE	HIGH	HIGH	LOW	MOD	**MOD**

CATASTROPHIC FIRE POTENTIAL

Code	Description		
1	Ashland Township	South Half	MODERATE
2	Barton Township	North Half	MODERATE
3	Beaver Township	North Half	MODERATE
4	Big Prairie Township	South Half	MODERATE
5	Bridgeton Township	South Half	MODERATE
6	Brooks Township	South Half	MODERATE
7	Croton Township	South Half	HIGH
8	Dayton Township	South Half	MODERATE
9	Denver Township	North Half	MODERATE
10	Ensley Township	South Half	MODERATE
11	Everett Township	South Half	HIGH
12	Garfield Township	South Half	MODERATE
13	Goodwell Township	North Half	HIGH
14	Grant Township	South Half	MODERATE
15	Home Township	North Half	HIGH
16	Lilley Township	North Half	HIGH
17	Lincoln Township	North Half	HIGH
18	Merrill Township	North Half	HIGH
19	Monroe Township	North Half	HIGH
20	Norwich Township	North Half	MODERATE
21	Sheridan Township	South Half	MODERATE
22	Sherman Township	South Half	MODERATE
23	Troy Township	North Half	HIGH
24	Wilcox Township	North Half	MODERATE

COMPOSITE COMMUNITY ASSESSMENT RATING							
Township	**Fuels Rating**	**Ignition Risk**	**Values**	**Protection**	**Catastrophic Fire Potential**	**Fire History**	**Total**
Ashland	LOW	HIGH	MODERATE	MODERATE	MODERATE	MODERATE	**MODERATE**
Barton	MODERATE	LOW	LOW	HIGH	MODERATE	LOW	**LOW**
Beaver	MODERATE	HIGH	LOW	MODERATE	MODERATE	LOW	**LOW**
Big Prairie	MODERATE	MODERATE	MODERATE	MODERATE	MODERATE	HIGH	**MODERATE**
Bridgeton	LOW	MODERATE	MODERATE	MODERATE	MODERATE	LOW	**LOW**
Brooks	MODERATE	LOW	HIGH	MODERATE	MODERATE	HIGH	**HIGH**
Croton	MODERATE	LOW	MODERATE	HIGH	HIGH	HIGH	**HIGH**
Dayton	LOW	HIGH	MODERATE	LOW	MODERATE	MODERATE	**MODERATE**
Denver	MODERATE	MODERATE	MODERATE	MODERATE	MODERATE	MODERATE	**MODERATE**
Ensley	LOW	LOW	LOW	MODERATE	MODERATE	MODERATE	**LOW**
Everett	MODERATE	MODERATE	MODERATE	MODERATE	HIGH	HIGH	**HIGH**
Garfield	LOW	HIGH	MODERATE	MODERATE	MODERATE	MODERATE	**MODERATE**
Goodwell	MODERATE	LOW	LOW	LOW	HIGH	LOW	**LOW**
Grant	MODERATE	HIGH	LOW	MODERATE	MODERATE	HIGH	**MODERATE**
Home	MODERATE	MODERATE	MODERATE	HIGH	HIGH	MODERATE	**MODERATE**
Lilley	MODERATE	MODERATE	HIGH	HIGH	HIGH	HIGH	**HIGH**
Lincoln	MODERATE	LOW	MODERATE	LOW	HIGH	MODERATE	**MODERATE**
Merrill	MODERATE	LOW	HIGH	HIGH	HIGH	HIGH	**HIGH**
Monroe	MODERATE	HIGH	MODERATE	HIGH	HIGH	LOW	**MODERATE**
Norwich	MODERATE	MODERATE	LOW	MODERATE	MODERATE	LOW	**LOW**
Sheridan	LOW	LOW	MODERATE	LOW	MODERATE	LOW	**MODERATE**
Sherman	MODERATE	MODERATE	MODERATE	LOW	MODERATE	HIGH	**MODERATE**
Troy	MODERATE	HIGH	MODERATE	HIGH	HIGH	MODERATE	**MODERATE**
Wilcox	MODERATE	LOW	MODERATE	MODERATE	MODERATE	HIGH	**MODERATE**

SECTION SEVEN – EMERGENCY OPERATIONS

Incident Command

The inherent complexity of large emergencies and disasters, coupled with the growing need for multi agency and multi functional involvement in responses has made it a critical need for a single standard incident management system that can be used by all government, public, and private emergency response entities. As such, Newaygo County will utilize the practices described in the National Incident Management System (NIMS) to manage operations (including those not involving state or federal agencies) as authorized in appropriate federal, state, and local authorities including:

- Federal - HSPD-5, Management of Domestic Incidents
- State – Michigan State Executive Directive No. 2005
- Local - Newaygo County NIMS Resolution September 2005.
- Local – Individual Township, City, and Village Resolutions

National Incident Management System (NIMS)

On February 28, 2003, the President issued Homeland Security Presidential Directive (HSPD)–5, Management of Domestic Incidents, which directed the Secretary of Homeland Security to develop and administer the National Incident Management System (NIMS). This system provides a consistent nationwide template to enable Federal, State, local, and tribal governments as well as private-sector and nongovernmental organizations to work together effectively and efficiently to prepare for, prevent, respond to, and recover from domestic incidents, regardless of cause, size, or complexity.

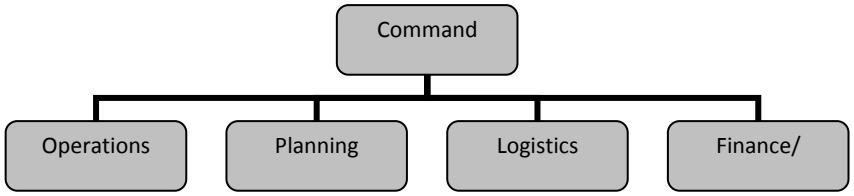
While most incidents are generally handled on a daily basis by a single jurisdiction at the local level, there are important instances in which successful domestic incident management operations depend on the involvement of multiple jurisdictions, functional agencies and emergency responder disciplines. These instances require effective and efficient coordination across this broad spectrum of organizations and activities. NIMS uses a systems approach to integrate the best of existing processes and methods into a unified national framework for incident management. This framework forms the basis for interoperability and compatibility that will, in turn enable a diverse set of public and private organizations to conduct well-integrated and effective incident management operations. It does this through a core set of concepts, principles, procedures, organizational processes, terminology, and standards requirements applicable to a broad community of NIMS users.

NIMS has six major components, which work together to form the national framework for preventing, responding to, and recovering from all types of domestic incidents:

- Command and Management
- Preparedness
- Resource Management
- Communications and information management
- Supporting technologies
- Ongoing management and maintenance

Unified Incident Command System

An integral component of the National Incident Management System is the Incident Command System (ICS). It is designed to enable effective and efficient domestic incident management by integrating a combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure. It is widely applicable and used to organize both near-term and long-term field-level operations for a broad spectrum of emergencies, from small to complex incidents, both natural and manmade. ICS is used by all levels of government – Federal, State, local, and across all disciplines. The ICS structure has five major functions, as described below.



- COMMAND - Sets objectives and priorities; Has overall responsibility at the incident or event; Provides for incident Safety, Liaison, and Public Information elements.
- OPERATIONS - Conducts tactical operations to carry out the plan; Develops the tactical objectives; Directs all tactical resources.
- PLANNING - Develops the action plan to accomplish the objectives; Collects and evaluates information; Maintains resource status.

- LOGISTICS - Provides support to meet incident needs; Provides resources and all other services needed to support the incident.
- FINANCE/ADMINISTRATION - Monitors costs related to incident; Provides accounting, procurement, time recording, cost analyses.

A critical aspect of ICS involves the use of an Emergency Command Post to direct on-scene coordination through "unified command". This allows key emergency response officials to jointly participate in the incident's management and ensures a central point of communication and authority. Identified staging areas provide for the management of resources and personnel accountability.

Incident Management Teams

To support the implementation of N.I.M.S. ICS, an Incident Management Team (IMT) is a group of command and general staff in an ICS organization that are often pre-designated members to ensure that they have the necessary training and experience to fulfill the roles and responsibilities of the ICS position. The level of training and experience of the IMT members, coupled with the identified formal response requirements and responsibilities of the IMT, are factors in determining the "Type", or level, of IMT. The following indicates these factors in the composition of the Incident Management Team established for the jurisdiction per FEMA standards.

N.I.M.S. Incident Management Team

RESOURCE:	***Incident Management Team***					
CATEGORY:	Resource Management	**KIND:**	Team			
MINIMUM CAPABILITIES:		**TYPE I**	**TYPE II**	**TYPE III**	**TYPE IV**	**OTHER**
COMPONENT	**METRIC**					
Personnel	Incident Commander	Yes	Yes	Yes	Yes	
Personnel	Operations Section Chief	Yes	Yes	Yes	Yes	
Personnel	Planning Section Chief	Yes	Yes			
Personnel	Logistics Section Chief	Yes	Yes	Yes		
Personnel	Finance/Admin Section Chief	Yes	Yes	Yes	Yes	
Personnel	Specialized Functions (i.e., HazMat, Insurance, etc.)	Yes	Optional	Optional	Optional	

A command team comprised of the Incident Commander, appropriate command and general staff personnel assigned to an incident. (*Source: FIRESCOPE*)

Components and Capabilities: Variations may also be based on level and type of disaster experience. (i.e., local event experience vs. national event experience).

The Incident Commander's responsibility is the overall management of the incident (to which they are assigned). In most incidents, the command activity is carried out by a single Incident Commander. The Incident Commander is selected by qualifications and experience. The Incident Commander may have a deputy, who may be from the same agency, or from an assisting agency. Deputies may also be used at section and branch levels of the ICS organization. Deputies must have the same qualifications as the person for whom they work, as they must be ready to take over that position at any time. Depending on the extent of the Incident Management team needed, this area of management may also have under its purview an Information Officer, Liaison Officer, Agency Representative(s), and Safety Officer.

The Operations Section Chief, a member of the General Staff, is responsible for the management of all operations directly applicable to the primary mission. The Operations Chief activates and supervises organization elements in accordance with the Incident Action Plan and directs its execution. The Operations Chief also directs the preparation of unit operational plans; requests or releases resources; makes expedient changes to the Incident Action Plan as necessary; and reports such to the Incident Commander. Depending on the extent of the Incident Management team needed, this area of management may also have under its purview a Branch Director, Division/Group Supervisor, Strike Team/Task Force Leader, Single Resource Coordinator, and Staging Area Manager.

To further enhance local NIMS ICS capabilities, the Newaygo County Emergency Action Guidelines promotes the use of "The NATIONAL INCIDENT MANAGEMENT SYSTEM INCIDENT COMMAND SYSTEM EMERGENCY RESPONSE FIELD GUIDE" as a standardized procedure for implementing ICS within the jurisdiction. Accompanying ICS forms can be obtained from NOAA's National Ocean Service Office of Response and Restoration ICS form software.

NOTE: Incident management is the primary responsibility of the Emergency Services Director in conjunction with public safety incident commanders. As such, this subject is further addressed in the Direction/Control EAG Section.

Emergency Operations Center (EOC)

Although most emergencies can be managed through sole use of the Incident Command System and on-scene Unified Command, emergencies of significant proportions and/or affecting large areas may necessitate the activation of the jurisdiction's Emergency Operation Center (EOC).

The EOC provides a central point for the jurisdiction's Chief Elected Official and emergency response officials to make prioritized decisions. The EOC represents the jurisdiction's highest level of coordination and is staffed by the jurisdiction's highest-ranking officials, allowing it to make high-level policy decisions and emergency protective actions. Due to their responsibilities, Emergency Operations Center officials are identified in the Emergency Action Guidelines as Section Coordinators and compose the Local Emergency Planning Team with the Emergency Services Director acting as Chair.

As effective emergency operations require additional key entities to support EAG functions, Section Coordinators manage functional actions through use of an EOC localized incident command system.

PRIMARY EOC LOCATION	**Newaygo County DBH Building** **306 S North Street, White Cloud, MICHIGAN**

Alternate EOC's may be designated as the primary if necessary and any suitable building or area near the scene may be designated for use as a tertiary EOC if required.

NOTE: Emergency Operations Center is the primary responsibility of the Emergency Services Director/Deputy Director and is further addressed further addressed in the Direction/Control EAG Section.

Multi-Agency Coordination (ICS / EOC / 911 Interface)

Due to the critical roles and responsibilities of the Emergency Operations Center, Incident Command Posts, and 911 Central Dispatch in coordination and resource management, a formal plan for their interface must be established. The following describes the jurisdiction's interface plan:

Emergency incidents that only require the on-scene activation of an Incident Command Post and use of the Unified Command System will sufficiently allow the incident commander to request resources through traditional methods of 911 Central Dispatch. If the incident

becomes significantly involved, the Command Post staff may alleviate 911 Central Dispatch workload by assuming responsibility for the direct management of resources while requiring only summary advisement to 911 Central Dispatch. As these operations still require high level coordination and support functions provided by the Emergency Action Guidelines, the Emergency Services Director may interface with the ICS system at the command level, or be instituted into the Planning Division.

Large emergency and disaster events requiring significant involvement, covering mass area, involving multiple Incident Command Posts, and/or require high level authority will necessitate the limited or full activation of the Emergency Operations Center. These events will often require the declaration of a local state of emergency by the Chief Elected Official and involve activation of the Emergency Action Guidelines Section Coordinators to staff the EOC. During such events, the Emergency Operations Center will have ultimate authority for making protective actions and prioritizing resources for the jurisdiction with the Emergency Action Guideline Section Coordinators managing their appropriate functions, responsibilities, and resources as the Emergency Services Director acts as Chief of Staff.

As such, the EOC will assume responsibility for the majority of the jurisdiction's resources, providing only minimal (if any) emergency resources for availability by 911 Central Dispatch to manage routine emergencies. Incident Commanders will request resources from the EOC as routine citizen emergency service resources will be managed by 911 Central Dispatch. It is quite probable that 911 Central Dispatch will also require resources from the EOC under these situations.

Mutual Aid and Resource Typing

The primary concept of NIMS is based on the need for standard definitions and practices; differing definitions will in effect negate the fundamental idea that all responders should be using common definitions when ordering or receiving assets through mutual aid. Systems that do not conform to these common definitions are not compliant with NIMS

Mutual Aid and Resource Typing supports the NIMS by establishing a comprehensive, integrated national mutual aid and resource management system that provides the basis to type, order, and track all (federal, state and local) response assets. Specifically, it allows emergency management personnel to quickly and effectively facilitate the response of resources to the requesting jurisdiction

The FEMA/NIMS Integration Center Resource Typing Definitions provide emergency responders with the information and terminology they need to request and receive the appropriate resources during an emergency or disaster. The Center is urging that federal, state, territory and local officials use the 121 Resource Typing Definitions as they develop or update response assets inventories. They are intended to help make the resource request and dispatch process more accurate and efficient.

The 120 typed response assets are organized by:

- Category – function for which the resource is most useful (firefighting, law enforcement, health and medical, etc.);
- Kind – broad class of characterization, such as teams, personnel, equipment, and supplies – metrics have been developed for each kind and are measurements of capability or capacity; and
- Type – measure of minimum capabilities to perform its function – Type I implies a higher capability than Type II.

Newaygo County utilizes the NIMS IRIS Database to constitute its Resource Management / Typing system. Developed by the National Integration Center (NIC) Incident Management Systems Division, the NIMS IRIS constitutes a national standard for resource management for Federal, State, local, and tribal officials to inventory, manage, and deploy resources based upon mission requirements capability, and other critical details.

In addition, the Newaygo County Fire Chiefs Association have a signed Mutual Aid Agreement with fire services and medical resources from 6 surrounding counties.

Emergency Plans

The following are guidance documents which directly impact a response to a wildfire in Newaygo County.

Newaygo County Emergency Action Guidelines

The Newaygo County Emergency Services Department in conjunction with the Newaygo County Local Emergency Planning Team, comprised of numerous government, public and private officials, developed the Newaygo County Emergency Action Guidelines to describe how different government and non-government entities will interact with each other to respond effectively during any disaster or emergency situation. These guidelines assign various emergency objectives and responsibilities that may or may not need to be performed during any emergency or disaster situation. Objectives and responsibilities are assigned to the organizations best suited to performing them due to their local roles and capabilities.

The Emergency Action Guidelines were designed to guide officials in the special considerations necessary when circumstances call for response and recovery measures outside the realm of normal operations. When planning for emergency response to large emergency and/or disasters, agency officials establish internal procedures that support the responsibilities assigned in the Emergency Action Guidelines and train to effectively accomplish those goals. A copy of the Newaygo County Emergency Services Program Overview and Basic Plan can be located at http://www.countyofnewaygo.com/ES/ServicesProvided.htm

State Emergency Management Support Document – Evacuation for Wildfires

This document has been developed to identify the various roles of the Michigan Department of Natural Resources and Environment (DNRE), United States Department of Agriculture (USDA)- Forest Service, Local Fire Departments, Law Enforcement, and other Agencies when responding to wildfires that require the evacuation of the population. By identifying who is responsible for firefighting, warning, and evacuation of the public before a fire actually occurs, valuable time can be saved which will help prevent or reduce the loss of life and property. Under this document, all agencies agree to conduct all operations under the Incident Command System (ICS) and the National Incident Management System (NIMS).

SECTION EIGHT – MITIGATION ACTION PLAN

IDENTIFICATION OF ALTERNATIVES FOR SOLVING PROBLEMS

Since there are a multitude of alternatives for mitigating hazards, it is helpful to first look at the approaches for doing so. According to the Michigan State Police Emergency Management and Homeland Security Division, and highlighted in the Newaygo County Hazard Management Plan, the five basic hazard mitigation approaches are as follows.

Five Basic Hazard Mitigation Approaches

- ✓ **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 – Segregating the Hazard** to try to "*keep the hazard away from the people*." This can be done by creating defendable spaces around homes and improving ingress and egress to homes which could provide fuel breaks in areas of continuous fuels.

- ✓ **Strategy #3 – Preventing or Limiting 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 – Altering Design or Construction** to make it 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

Preventive Measures

Preventive measures protect new construction from hazards and assure that future development does not increase the potential for losses. They are particularly important in Newaygo County where there is an abundance of land that could be developed. Planning, zoning, and code enforcement offices usually administer preventive measures. They include the following:

- Building Codes;
- Standards for Manufactured Homes;
- Planning and Zoning;
- Subdivision Regulations;
- Open Space Preservation; and
- Storm water Management.

Building Codes

Stronger building codes and regulations are intended to improve the sustainability of a community. When utilized, they are one measure that can be taken to protect new property from damage by wildfires. The role of stronger building codes for wildfires is to reduce the ignitability of homes though use of ignition-resistant construction techniques or non-combustible building materials. As the flammability of structural and vegetative fuels is reduced, communities become more resistant as they no longer support combustion.

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, etc

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 of Natural Resources and Environment (MDNRE) 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. About 23% of all homes in Newaygo County are mobile homes.

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. Comprehensive 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. The Newaygo County Comprehensive Land Use Plan of 2010 provides county and local decision makers with common guidelines for future development. In addition; all local units of government except Goodwell Township, Lincoln Township, and Troy Township; have adopted master plans.

Zoning codes are considered the primary tool to implement a comprehensive plan's guidelines for how land should be developed. They regulate development by dividing communities into zones or districts and setting development criteria for each zone or district. Communities can prohibit development in some areas; such as in flood plains, along shorelines or in the hydraulic shadow of dams where flooding would occur if the dam failed. Zoning ordinances usually set minimum lot sizes for each zoning district but communities can allow flexibility in lot sizes and location so that developers can avoid hazardous areas.

One way to encourage such flexibility is to use the planned unit development (PUD) approach, which allows the developer to easily incorporate flood hazard mitigation measures into the project. Defendable Space preservation can be accommodated with site design standards and adjusted land use densities. Newaygo County does not oversee any zoning; therefore, all municipalities in the county establish their own zoning ordinances.

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.

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
- Lots with building sites above the flood level.

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

The best 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. The Newaygo County Comprehensive Recreation Plan – 2006 contains an informative inventory of the county's natural resources and parks. Documents such as this 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.

Corrective Measures

When structures and communities are located in hazardous areas, corrective measures are directed at working with current conditions. Examples of the more common corrective measures include:

Modifications: Modifications to a site and/or to a structure. Examples include landscape grading, or retrofitting existing structures to be damage resistant (i.e. Firewise landscaping and construction)

Relocation: Permanent evacuation of hazard-prone areas through movement of existing hazard-prone development and population to safer areas. The two common approaches to relocation are physical removal of buildings to a safer area with future use of the vacated area limited to permanent open space, and replacing existing land uses with others that are less vulnerable to the hazard.

Acquisition: Public acquisition and management of lands that are vulnerable to damage from local hazards. Following acquisition, land uses more appropriate to the degree of risk may be chosen. Public acquisition has been achieved by: a) purchase at full market value; b) purchase at less than full market value through such methods as foreclosure of tax delinquent property, bargain sales, purchase and lease back, etc.; c) donation, through reserved real estate, donation by will, donation and lease back; d) leases; and e) easements.

Modification measures are normally implemented by property owners and include actions to modify the site to keep the hazard from reaching the building; to modify the building/site, or retrofit it, so that it can withstand the impacts of the hazard; and to insure the property to provide financial relief after damage occurs. Relocation and acquisition measures can be implemented by property owners and/or governments through technical and financial assistance.

Site Modification

Natural hazards generally do not damage vacant areas but instead threaten people and improved property. In some cases, properties can be modified so the hazard does not reach the damage-prone improvements.

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 provide 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.

<u>Pre-disaster funding sources:</u>

- 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.

<u>Post-disaster funding sources:</u>

- 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 run-off 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 though 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:

- Wetland protection;
- Erosion and sedimentation control;
- River restoration;

- Best management practices;
- Dumping regulations;
- Urban forestry; 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. The City of Fremont is the only municipality in Newaygo to achieve the “Tree City USA” endorsement.

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 Newaygo 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.

POTENTIAL HAZARD 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 Newaygo, 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 fire in Newaygo County.

Management Objectives

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

1. Suppress wildfires using an appropriate management response, in a manner compatible with Management Area objectives. (Source: Hazard Mitigation Forum Fire Management Plan)

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 (Source: Hazard Mitigation Forum Fire Management Plan)

3. Support the members of the Michigan Interagency Fire Prevention (MFPA) as a way to further the message of fire prevention. (Source: Hazard Mitigation Forum Fire Management Plan)

4. Continue to assist and encourage communities to prepare and participate in the Community's Wildfire Protection Plan (Source: National Fire management Plan)

5. Utilize fuels management techniques to restore fire to its natural role in the ecosystem (Source: National Fire Management Plan)

Objective 1: ***Suppress wildfires using an appropriate management response, in a manner compatible with Management Area Objectives.***

Potential Action Items:

1. Adopt the National Incident Management System and incorporate NIMS principles into agency Policies and Procedures

2. Conduct National Incident Management System Incident Command Training for all emergency first responders and utilize Incident Command during disaster exercises.

3. Utilize NIMS Incident Command principles in all emergency responses.

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.***

Potential Action Items:

1. Adopt the recommendations and strategies of the "Firewise" program via local resolution, which include encouraging all residents living in the wildland/urban interface area to become acquainted with Firewise mitigation strategies to protect their property from wildfire hazards and recommending to production companies and land owners that they employ Firewise principles of proper grounds maintenance, equipment storage, vegetation clearance and other techniques.

2. 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.

3. Encourage retrofitting of ignition resistant building techniques including closed decks, balconies, and porches to prevent debris and embers collecting.

4. Encourage creating defendable 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.

5. Promote creating better ingress and egress to homes including clearance of tree branches, access roads, etc. Encourage improvement of private or public roads which could provide fuel breaks in areas of continuous fuels.

6. Promote incorporation of the Firewise Construction Standards, 2006 International Wildland Urban Interface Code and the 2006 International Fire Code into existing building codes, zoning ordinances, and community land use plans.

7. Assist those with special needs with applying Firewise Mitigation Strategies.

8. 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.

Objective 3: ***Support the members of the Michigan Interagency Fire Prevention (MFPA) as a way to further the message of fire prevention. (Source: Hazard Mitigation Forum Fire Management Plan)***

Potential Action Items:

1. Conduct Firewise public education campaigns and awareness programs to inform the public about the wildfire hazard in Newaygo County, the measures necessary to minimize potential damage and injury, and what mitigation actions can be taken.

2. Conduct Assessing Wildfire Hazards in the Home Ignition Zone training for local volunteer fire departments and conduct home assessments in the Wildland Urban Interface communities and surrounding areas.

Objective 4: ***Continue to assist and encourage communities to prepare and participate in the Community's Wildfire Protection Plan (Source: National Fire Management Plan)***

Potential Action Items:

1. Annually review the CWPP with the Local Emergency Planning Team and the Community Wildfire Protection Plan Workgroup to ensure the plan continues to meet the community's needs.

2. Foster public, interagency, and interdisciplinary cooperation when identifying, developing, and prioritizing hazardous fuels mitigation measures annually.

3. Work with communities on pilot projects such as brush disposal sites, Firewise mitigation projects, etc.

Objective 5: ***Utilize fuels management techniques to restore fire to its natural role in the ecosystem (Source: National Fire Management Plan)***

Potential Action Items:

1. Employ hazardous fuels reduction techniques including community level vegetation management, prescribed burning, vegetation removal, vegetation clearing and/or thinning, slash removal, and vertical clearance of tree branches.

2. Employ chemical treatments including herbicide applications with appropriate safeguards to ensure protection of human life, environment, and watersheds; and grazing or biomass conversion.

3. Employ mechanical treatments such as disking, mulching, grinding, mowing, chopping, and removal of such material.

4. Employ Biomass removal including clearing straw, dead or dry vegetation, thinning, removal of bush and pine straw or blown-down timber from wind throw, ice, or a combination thereof, etc

5. Employ the creation and maintenance of fire breaks, access roads, and staging areas.

6. Employ prescribed burning or clear cutting.